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LEAN FROM THE FIRST-LINE MANAGERS' PERSPECTIVE – ASSUREDNESS ABOUT THE EFFECTS OF LEAN AS A DRIVING FORCE FOR SUSTAINABLE CHANGE

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Abstract
The purpose of this article is to present the results from a survey concerning first-line managers' assuredness about the effects of Lean after two years of Lean application in a Swedish healthcare organization. The purpose is also to reflect about assuredness as a driving force for sustainable change. Questionnaires were sent to all first-line managers in a healthcare organization in order to investigate how these managers consider their role, ability and conditions to create change according to Lean. One of the questions included 17 statements about how assured these managers were about the effects of Lean. The results from this question will be presented in this paper. The study showed that the majority of the first-line managers in this particular healthcare organization were assured that developmental work supported by Lean contributes to a higher patient focus, supports first-line managers with useful tools and methods, contributes to the development of an improvement culture and that the Lean concept in general is a support in improvement work. The question can either be used separately or as a part of an entire questionnaire in healthcare organizations. Asking first-line managers about their assuredness about the effects of Lean on a regular basis is one way to follow the Lean process from their perspective. The survey question might encourage discussions about the process of Lean and hopefully contribute to a greater understanding about the importance of assuredness and about the desired effects when applying Lean.

Keywords
Lean, Lean healthcare, leadership, improvement work, first-line managers, assuredness..

Introduction

What are you assured about? What is it that makes you confident about that? What feelings do you get when you're assured about something? If you're a leader, are you convinced that change is necessary? And if so, are you assured that the organizational Quality Management (QM) initiative will support you as a leader to reach the desired effects? Many questions can be asked about the phenomenon and human experience of assuredness. In this paper some of them will be reflected on and discussed as we approach assuredness as a driving force for sustainable change.

Lean is a system that focuses on creating customer value and minimizing different kinds of waste by improving the processes. The starting point is always to let the customer define value before identifying the value stream. Also it's fundamental that Lean has a long-term perspective [1, 2]. The Lean concept was popularized by Womack et al. in the book The Machine That Changed the World [1], where it was explained how the Toyota production system could improve quality and simultaneously reduce the cost of the cars [1, 4]. The public sector began implementing Lean in early 2000 and Lean initiatives in healthcare were reported soon after [5].

Lean Healthcare has developed to meet different challenges [4] and especially the necessity to do more with less appears to have driven its application in healthcare [6, 7]. It's often commented that the healthcare sector needs change and development and to a large extent this refers to improvements in efficiency and it's also suggested that healthcare organizations need to be more attractive employers to meet future requirements [8]. In recent years, there has been an increase in the use of Lean principles and methods in healthcare with the aim to improve and shorten care processes but Lean Healthcare is still in an early stage of development [9] and it's a debated subject [4]. There seem to be challenges as to how it's implemented [10, 11], how healthcare professionals get engaged [4, 12] and how leadership is developed and these challanges are claimed to be key ingredients to success [5, 13, 14]. Organizations need to have a clear Lean strategy [1, 2, 15] in order to reach sustainable change.

Lean is often perceived as a set of tools and techniques for improving processes but researchers stress that Lean shouldn't be considered as a one-off change of work processes but rather a new way of thinking and working [4, 13]. The consequence of having a process-only improvement approach to Lean is that techniques and tools are considered to be the essence of this concept [9] but researchers argue that the success of Lean applications lies in understanding that Lean is a system, not simply a toolbox [16, 17]. Focus needs to be put on the development of a sustainable culture where problems are handled and solved in a structured way [9]. Several authors have argued that Lean only makes a lasting contribution if it enhances the problem-solving abilities of healthcare professionals, teams and ultimately entire institutions, and that leadership is essential [14, 18, 19]. Instead of having this quick win, tool-based approach researchers emphasize the importance of developing people and creating a continuous improvement culture as well as the leadership competence to introduce an effective Lean application in healthcare [18, 20, 21].

First-line managers and their role in improvement work have not to date attracted much interest in research although these managers often are considered to be the owners of change and in general given the responsibility to integrate improvement concepts into the daily work [22]. They need a clearly defined role to support and develop their employees in the process of change [23]. Executive leaders need to show genuine interest in Lean work, pay attention to the results that are being delivered and, if things are not going as planned they need to ask first-line managers why [16]. If first-line managers are given the responsibility to start the Lean application in daily practice, "*are they then assured that Lean will be a support to reach the desired effects and organizational goals"?* The purpose of this article is to present the results from a survey concerning first-line managers' assuredness about the effects of Lean after two years of Lean application in a Swedish healthcare organization. The purpose is also to reflect about assuredness as a driving force for sustainable change.

Theoretical background

What is assuredness?

It might be an obvious statement that assuredness is an important condition for successful Lean applications but what is it actually? Assuredness is a state of mind in which one is free from doubt and is a synonym with assurance, confidence, certainty, doubtlessness, sureness and positiveness [24].

According to Kotter's [25] 8-Step Change model, step one is to develop a sense of urgency around the need for change. He stresses that the urgency rate has to be about 75% which means that this percentage of a company's managers must be honestly convinced that the business as it's managed and lead today is totally unacceptable. He also concludes that there is a human tendency to present unpleasant facts to motivate for change (ibid). In this article this sense of urgency is expressed as an assuredness that change is necessary. The word urgency can signal that there has to be a threat but a belief that talking about creating assuredness about change might be a positive way to motivate for change in organizations. As Yukl [26] comments, many organizations at present are not experiencing a crisis or threat to their survival but nevertheless gradually need to develop and change to meet customer needs today and in the future. Therefore an important role of a leader is to explain why change is essential and persuade key people in the organization about the need for change to gain their support. In this article the word persuade isn't used but instead it's expressed that leaders need the ability to assure others that change is necessary. According to Lindqvist Grinde [28], assuring someone is in general considered as something positive, using arguments to affect the other person's opinion about something. Yukl [26] claims that leaders need to provide information and help people understand what the effects will be now and in the future if change is to be achieved. Considering that, assuring someone, with a good intention, also can mean helping someone to find motivation and commitment to improvement work.

The ability to create assuredness is an art of its own that was created by the philosopher Aristotle, in the 4th century BC when he laid the foundations of rhetoric. *What is it that creates assuredness in the human being?* Aristotle asked and then explained that there are three ways to do this. ETOS is about assuring someone through creating confidence. PATOS is to assure by appealing to human feelings such as talking about common experiences and using metaphors and pictures with the intention of creating a feeling of community. Assuring through LOGOS is speaking in a way that makes it possible to reach people's common sense. Aristotle emphasized the importance of working together with the ones who are to be assured [28]. In addition to suitable arguments, relevant facts need to be presented and it's an advantage to possess the art of rhetoric as developed by Aristotle. A person who aims to assure someone else needs to listen to the other person, as this author explains, and in that respect it's a two-way communication.

Why ask the leaders about assuredness?

According to Liker [2], a deep cultural transformation is necessary in order to successfully apply Lean, something merely implementing Lean tools will never achieve. Managers are crucial to the outcome of applying Lean and leaders at all levels influence which culture will be predominant in the organization, since how the manager acts and behaves influences the attitudes and behaviors of the rest of the employees (ibid). The Lean leader needs to be a role model for his or her employees in order to achieve a better improvement culture [29]. Within Lean the main way of changing the organizational culture is by doing. Shook [30, p. 66] writes in his paper about his experiences from the NUMMI factory: "What my NUMMI experience taught me that was so powerful was that the way to change culture is not to first change how people think, but instead to start by changing how people behave – what they do".

Lean leaders possess the balance between structure, process and culture, and are passionate about involving people as well as having an in-depth understanding of the work [2]. After studying the influence of leadership when applying Lean in SMEs, Achanga et al. [31], concluded that leadership includes factors such as having a clear vision, good levels of education and the willingness to support the Lean initiative.

In Rogers [32, 33] "the diffusion of innovations theory" is presented where diffusion is explained as "the process through which an innovation, defined as an idea perceived as new, spreads via certain communication channels over time among the members of a social system". His theory seeks to explain how, why and at what rate new ideas and technology spread through cultures. Innovations (ideas) must be widely adopted in order to self-sustain and Rogers [32] divides people into five groups depending on how quickly they adopt new ideas. Innovators (2.5% of a population) are the first to accept the new idea and are in general people who are willing to take risks, are well-educated and interested in development. The early adopters (13.5%) are the second ones to embrace the innovation and many are socially skilled leaders. Then there's the early majority (34%) and the more skeptical late majority (34%). Finally there are the laggards (16%) who are the last ones to accept new ideas (ibid).

What effects of Lean are described in research?

The impact of Lean on quality improvement in healthcare has been relatively positive according to many [11, 16, 17, 34] and often effects such as reduced waiting times and costs are described [5, 16, 35]. At the same time there's a lack of rigorous research on the outcomes from Lean Healthcare. Poksinska [4] concludes by stating that although results from several Lean initiatives have been reported, methodologically the studies are not comparative and generally include self-reporting results. Many case studies about Lean application in healthcare have been reported in the 21st century and most of them describe ineffective processes to varying degrees. The most common effects reported were time-savings, timeliness of service, cost reductions, productivity enhancements, reduction in errors and mistakes, improved staff and patient satisfaction, reduction in steps in processes, increased process understanding, staff engagement, a calmer and more focused working environment, an increase in problems reported, improved teamwork and reduced mortality [17]. The outcomes from the Lean initiatives can be divided into two broad areas, according to Poksinska [4]. The first relates to the performance of healthcare such as better outcomes for patients with more accessible care with shortened treatment time and reduced waiting. The second relates to the development of employees and work environment with outcomes such as increased attention to waste, a more proactive attitude to problem solving, more responsibility, greater involvement, a sense of ownership at work and a more organized work environment. Such employee effects are also summed up by White et al. [36]. Cooperation is a desired effect but seems to be a complicated one to achieve according to Seddon et al. [35] and O'Brien & Boat [37] Improving the entire system, and not just individual departments remains a major challenge [38]. Lean Health-

care can foster interdisciplinary cooperation because everybody in the organization needs to be involved [37]. Poksinska et al. [39] state that Lean healthcare implementations seem to have a limited impact on improving patient satisfaction when patients in primary care were studied.

Brännmark et al. [40] state that there are few studies regarding employee effects from Lean in other contexts other than the manufacturing industry and that there is a need to study its impact on working conditions and employee health including longitudinal studies. Mixed or inconclusive results were shown in the few existing studies of employee effects such as on the working environment and health and it has shown that Lean Healthcare can lead to an increased workload and more stress. Radnor and Walley [9] state that while the Lean approach provides many means to employee participation, it can also provide a sense of change fatigue. Positive effects are reported by Spear [41] who saw great potential for empowering healthcare staff to drive process improvements. De Souza [42] argues that Lean healthcare can provide a structure, increase motivation and give employees ownership of their own working practices which in turn can lead to a healthier work environment but it depends on how the organization chooses to apply Lean. The stress levels for managers have also been reported as decreasing when new employee responsibilities became a routine as a Lean application progresses [43]. Psychosocial work conditions seem to be important for managers' health and their leadership [22].

Some authors suggest that there might be publication bias only showing Lean's positive result [17, 44–46]. According to Mcintosh et al. [46] (2014) there is limited evidence that Lean is a panacea against the rising public healthcare costs and patient safety after a literature review of 100 articles on Lean in the health sector that showed mixed results.

Methodology

A questionnaire was developed based upon a literature study. It was first reviewed and improved together with the research group at Mid Sweden University. After that a pilot study with five managers in the studied organization was conducted followed by minor improvements.

The questionnaires were sent to all first-line managers in a healthcare organization in order to investigate how these managers consider their role, ability and conditions to create change according to Lean. The questionnaire also included one question about how assured these managers were about the effects of Lean. This particular question contained 17 statements about these effects. To describe their assuredness, a Likert scale 1–5 was used, where 1 equals not at all assured and 5 highly assured.

All 112 first-line managers first received written information about the planned survey and its purpose a week before it was mailed to everyone. A reminder was sent out three times. The response rate varied from 71% to 58%, in this particular question 58% responded.

When analyzing the answers, the highly assured (5) and the assured (4) managers were added to be presented as the assured ones. A descriptive presentation of the actual percentage of managers' assuredness about the different effects of Lean was used to present the results. The managers who were not at all assured (1), not assured (2) or who gave neutral answers (3) were handled together as neutral or not assured.

Case description

A healthcare organization in the middle of Sweden with about 4000 employees serving a population of 128 000 was studied [47]. The investigation was carried through two years after the initiation of Lean which started with a Lean education program for all managers and medically responsible doctors in the organization. This program was given by Mid Sweden University.

One main argument for the application of Lean was financial challenges as well as long waiting times. A change vision was developed about a healthy population including the patients and everybody who works within the organization. Also the vision includes elimination of waiting. The organizational Lean values are respect, confidence and a holistic approach. In current documents, it's stated that the public health sector has to be a good role model as an employer and that this healthcare organization has to be credible to the patients it is serving [48].

Results and analysis

When analyzing the result it shows that the assurance that Lean contributes to a higher patient focus is quite high (77%) and there might be a basic understanding of how to start the Lean process; as Womack and Jones [1] state in their first principle, the starting point is always to let the customer define value before identifying the value stream. There is also a quite high assuredness (75%) that Lean supports first-line managers with useful tools and methods which might send a signal that Lean is essen-

tially perceived as a set of tools and techniques for improving processes. This is quite common according to Poksinska [4]. 75% indicate that Lean contributes to an improvement culture but only 51% to problems being solved to a higher degree. Creating a continuous improvement culture is necessary to receive an effective Lean application in healthcare as authors such as Al-Balushi et al. [20] state and problems need to be handled and solved in a structured way [9]. 74% are also assured that Lean is a general support in improvement work which might signify that the concept provides a structure for how to drive change in practice.

Table 1
First-line managers' assuredness about the effects of Lean.

I am assured that Lean ...	Percent assured
... contributes to a higher patient focus	77%
... supports first-line managers with useful tools and methods	75%
... contributes to the development of an improvement culture	75%
... supports first-line managers in our improvement work	74%
... contributes to a higher patient security	69%
... contributes to a change in leadership	66%
... contributes to deeper understanding of the processes by the coworkers	66%
... contributes to a stronger focus on processes instead of individuals	62%
... contributes to shorter waiting times	59%
... contributes to problems surfacing to a higher degree	57%
... contributes to an improved cooperation between different professions	54%
... contributes to a healthier work environment	54%
... contributes to a changed co-workership	52%
... contributes to lowered costs	52%
... contributes to a better cooperation between different departments	51%
... contributes to problems being solved to a higher degree	51%
... contributes to a better patient treatment	39%

59% of the managers are assured that Lean contributes to reduced waiting times and 52% of lowered costs which are desired effects and often main reasons for applying Lean Healthcare [5, 6, 16]. 51% of the respondents are assured that Lean can improve cooperation between different departments and between professionals, something that is complicated to achieve according to Seddon et al. [35]. At the same time a high level of assuredness that cooperation will improve is important if the aim is to decrease waiting times and costs in the whole system [16]. 54% believe that Lean contributes to a healthier work environment and it's stated in the theory that there are mixed or inconclusive results about this [40]. 66% of the first-line managers are assured that Lean contributes to a change in leadership but only 52% indicate that Lean contributes to a change in co-workmanship. The only statement marked below 50% is the assuredness that Lean contributes to a better patient treatment (39%) which can be seen as a contradiction to the statement that most managers are assured that Lean contributes to a higher patient focus (77%).

Conclusion and discussion

The purpose of this paper was to present the results from a survey concerning first-line managers' assuredness to the effects of Lean after two years of Lean application in a Swedish healthcare organization. The purpose was also to reflect about assuredness as a driving force for sustainable change.

The results show that certain effects these managers are assured about might create a basis for further steps on the Lean road such as the assuredness that Lean creates possibilities to put the patient first and develop an improvement culture supported by useful tools and methods. At the same time some results analyzed raise questions about the basic understanding that Lean is a system where problems are used to develop an improvement culture and that change in leadership is connected to a changed coworkership.

Reducing waiting times and costs are the effects most commonly reported in research and often the main reasons to apply Lean healthcare and it's surprising that more managers are not assured about these. More than half of the first-line managers are assured that Lean contributes to a healthier work environment which should be an important question to discuss further in the organization as such desired effects might raise managers' and coworkers' motivation and engagement in improvement work. This seems to be important as the current organization states that the public health sector has to be a good role model as an employer to become credible to the patients it's serving.If there isn't a broad assurance that cooperation can be improved maybe there isn't

preconditions to succeed on a deeper level than just reaching some improvements on department level.

When analyzing the results the organization needs to ask a couple of questions in order to understand and act on the results;

- *How can a system view be reached to a higher extent when it's suspected that today Lean is mainly perceived as tools and methods for improving processes?*
- *How can problems be brought to light and solved in a structured way to develop a continuous improvement culture?*
- *How is it that only 51% see potentials with Lean to improve cooperation?*
- *Why is it that the assurance about a change in leadership is higher than a changed co-workership?*
- *What does the difference between the high assurance about patient focus and the low assurance about a better patient treatment represent?*

We sum up by asking: *Does first-line managers' assuredness about the effects of Lean in the studied organization affect the ability to create change?* This question may not be possible to answer, considering that assuredness doesn't necessarily lead to behavioral change, but hopefully raises the possibilities to get there. Generally, there are more respondents who state that they are assured or highly assured about the effects of Lean than not assured and those can be seen as early adopters [32]. Considering Rogers's theory, the majority of the managers need to be early adopters or at least early majority if the Lean application is going to spread at a desirable rate. The results show that the assuredness is quite high about the effects of Lean but not necessarily high enough at this point in time, considering Kotter's statement about the urgency rate. It can be stated that assuredness creates an important basis for further learning and development and the result sends a signal to the executives that there's an interest to understand and learn more about Lean. Also, it's important to highlight that this interest should to be taken care of and discussed while it's still there. The level of assuredness can increase as the improvement work gets started if positive consequences are experienced. Naturally, if the Lean process slows down or stops, assuredness also will decrease.

As we continue to reflect about the importance of first-line managers' assuredness to the effects of Lean as a driving force for sustainable change, as well as an important aspect of a successful Lean application, different factors become clear and other questions are raised such as: *How do first-line managers become assured that Lean will lead to certain effects and indirectly that the concept will support organizational development?* Education and sharing successes seem to be commonly used strategies to spread a QM initiative such as Lean in an organization. This might result in a sense that there are problems to solve, we need to do something and we need to change our working practices but not necessarily that Lean is the overall solution to the situation. As researchers state, Lean is learning by doing and has to be lived by everyone in the organization [2, 30] and then assurance based on experience can be acquired. Considering what creates assuredness in human beings, maybe healthcare leaders need to use ETOS and PATOS to a higher extent than today. It's assumed that LOGOS is a common approach to assuring others in healthcare considering that it's a sector based upon science and proven experience. When reflecting about assuredness as a driving force for sustainable change it's also important to remember Aristotle, who emphasized the importance of working and learning together with the ones who are to be assured, which in this case includes colleagues, managers at different levels as well as with coworkers.

As a conclusion we suggest it's of importance to talk about the assuredness in different forums considering that it strengthens the process perspective instead of choosing a result-only perspective on Lean applications. Reflecting on assuredness about the desired effects together with first-line managers as we suggest, is one way to create conditions for sustainable change or formulated it as a question; *Is assuredness in first-line management a prerequisite in improvement work for achieving sustainable change? Is it important to highlight first-line managers' assuredness on a regular basis?*

Implications for management in organizations applying Lean

The survey question can be used to encourage discussions about the process of Lean and hopefully contribute to a greater understanding about the importance of assuredness and about the desired effects when applying Lean. Asking first-line managers about their assuredness on a regular basis is one way to follow the Lean process from their perspective and, by doing that, maybe boost assuredness as a driving force for sustainable change.

Suggestions for further research

Observing leaders and how they behave in accordance to their assuredness in their daily work would be an interesting approach in further studies. Another suggestion is to study the assuredness about the effects of Lean in executive leadership as their approach to Lean is crucial for first-line managers' engagement and commitment [16]. *What happens*

if executives to a higher extent start to communicate about assuredness in change management? What happens if networks are created where first-line managers can integrate, motivate and help each other? And what happens if first-line managers promote the importance of assuredness when leading their coworkers and a common feeling is reached? And how can research contribute to assuredness? We believe that it is important to bring the assuredness aspect discussed in this paper into Lean healthcare.

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