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Multi-level Management and Leadership Skills in Lean Organizations

Dr Pauline A. Found*, Ms Desirée H. van Dun**, Dr Foster Fei***

*Lean Enterprise Research Centre, Cardiff Business School, Cardiff University, Cardiff, UK CF24 4AY. Email: FoundPA1@cardiff.ac.uk. Tel: 00 44 29 20647022

**Information Systems and Change Management, School of Management and Governance, University of Twente and House of Performance, Hamburgerstraat 30, 3512 NS Utrecht, The Netherlands, Email: d.vandun@hofp.nl. Tel. 0031 65372 6754

*** Cardiff University Innovative Manufacturing Research Centre, Cardiff Business School, Cardiff University, Cardiff, UK CF10 3EU. Email: Feifx@cf.ac.uk. Tel: 0044 29 20879327

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Abstract

Research shows that senior management commitment is essential to a successful and sustainable transition to a Lean enterprise but less focus has been given to the role of middle managers. This paper represents two strands of connected research that explore the behaviors and competencies of desired leaders and managers across different levels of the lean organizations and identifies the skills required to support and sustain a Lean transition. The Cardiff University (UK) SUCCESS program discovered that there are subtle differences in top management and leadership skills required to facilitate successful change from those required to sustain the change. Whilst research at University of Twente (NL) concluded that middle managers in established Lean organizations display higher levels of aptitude in certain skills from those in earlier stages of the transformation process. Hence, we suggest that both top and middle management need to adopt double-loop learning in order to improve their management and leadership skills over time to sustain Lean.

Key words: *Leadership; Lean management; Change management; Organizational Behavior; Double-loop learning.*

Introduction

Academics have agreed that not only is commitment of senior management to "Lean production" essential (Found & Harvey, 2006; 2007; Heymans, 2002; Savolainen, 2000; Swank, 2003; Waters & Bevan, 2005), but also that leadership can either 'make or break' a transition towards Lean and its sustainability (Emiliani, 2003; Fine, Hansen, & Roggenhofer, 2008; Found & Harvey, 2006; 2007; Lucey, Bateman, & Hines, 2005; Van Dun, Hicks, Wilderom, & Van Lieshout, 2008). In this paper, we deliberately treat both management and leadership interchangeably as one important body of population in Lean organizations and make no distinction between the two. We do however acknowledge the differences between "leadership" and "management" suggested in the literature (Kotter, 1990). Leaders, in our view, foster change and create an environment where change is the norm, whereas managers stabilize the organization and assure that the changes are well implemented. In fact, behavior of both managers and leaders are necessary to achieve excellence and different approaches may be needed at different times, depending upon the specific stage of the lean transformation process. Hence, we use the term interchangeably in this paper.

It is often considered that an effective Lean leadership style involves coaching and leadership behavior that fosters participation and employee empowerment within certain boundaries (Emiliani, 2003). However, we stress the fact that research has not yet defined a unified vision of the desired leadership mutually influencing across various levels in Lean organizations, as previous research largely focused upon different roles and tasks at specific leadership levels within lean organizations (e.g. team leadership and senior management). By combining two strands of connected research conducted within the United Kingdom and The Netherlands, this paper helps to build a general view on the concept of 'Lean Leadership'.

In this paper the behaviors and competencies of desired leaders and managers across different levels of Lean organizations are explored and the skills they require to support and sustain a Lean transition are identified. We conclude by discussing that successful Lean leaders, across various levels in Lean organizations, ultimately engage in iterative double-loop learning to enhance their leadership style and effectiveness while the Lean transition progresses.

Theoretical Background

The lean thinking approach

'Lean production' has its origins in the 1990 book *The Machine That Changed the World* (Holweg, 2007) in which Womack, Jones and Roos describe the Toyota Production System. Lean is a process-focused management approach that aims to increase customer value by reducing waste and continuously improving processes. A central tenet of Lean is that improvements are based on the ideas and knowledge of employees (Found & Harvey, 2006; Van Dun et al., 2008). Much has been written on the theory behind Lean, such as eight types of waste in organizations and the five principles of the Lean thinking approach (Womack & Jones, 1996). However, its success lies not in simply installing, or even 'cherry picking' the principles and tools; implementing Lean requires a long-term strategic choice and fundamental change from a traditional functional organization into a 'collaborative' organization. In this respect, Lean thinking can be viewed as a philosophy (Bateman, 2005; Bhashin & Burcher, 2004; Liker, 1996, 2004) and, according to Seddon (2005 p. 187), *"It is the philosophy behind the tools that is the key"*. To secure the philosophy requires promoting Lean leadership at all levels (Pullin, 2002), leaders with a clarity of vision (Hines, Lemming, Jones, Cousins, & Rich, 2000) and developing leaders who live the system from top to bottom (Liker & Meier, 2006).

Leadership and management styles in lean organizations

Although it is very difficult to find an explicit definition of leadership, Bryman (1992) suggests the broad definition can be given by the following approaches; the trait approach (leadership ability is innate), the style approach (leadership effectiveness is to do with how the leader behaves) and the contingency approach (it all depends; effective leadership is affected by the situation). More recently, academics have extended ways of classifying leadership approaches and, from the mid-1980s until the beginning of 2000, visionary paradigms represented transactional and transformational theories (otherwise known as new leadership which has been largely presented by Bass and Avolio (1990, 1993, 1994). However, at the same time of transformational and transactional theory, a separate leadership theory emerged which focused on "dispersed leadership" (Politis, 2005). See Table 1 for an overview.

Table 1 *Evolution of Leadership Theories through Time*

1920s	Influencing people through the possession of innate **traits**
1950s	Influencing people by demonstrating a **style** of behavior that shows concern for both task and people
1970s	Influencing people by demonstrating **different styles** depending on a range of **contingent** factors
1980s	**Transforming** organizations by managing meaning
2000s	Continuously adapting to strategic challenges by being **dispersed** throughout the organization

Adapted from: Huczynski and Buchanan (2001)

Middle managers as well as senior managers play an important role in facilitating change in organizations (Huy, 2002). In our definition a 'middle manager' is: *"Any manager two levels below the CEO and one level above line managers"* (Huy, 2001, p. 73). A 'senior manager' is defined as a member of a team of individuals, including the board of directors and/or owners of the company who, at the highest level of organizational management, have the

day-to-day responsibilities of managing a corporation instead of the day-to-day activities of managing the business.

In a recent presentation on Lean Leadership, Jim Womack (2008) said that every organization must address the 3Ps: *purpose*, *processes* and *people*. He believes that most organizations struggle because the purpose is not clearly defined, the processes are not clearly specified and the people are not fully engaged. In his view these are the responsibility of the leaders and managers of Lean organizations. Jim Womack believes that one of the problems is that traditional organisations have a vertical focus, and managers think vertically to optimize their area, department or function. Lean managers, on the other hand, think horizontally, in the direction that value flows through the organization. However, this does not imply that functions are less strong in Lean organisations. In many cases, including Toyota, they are even stronger. Lean organisations create strong horizontal focus by assigning a responsible person to manage product flow at the same time as they create strong functions that focus on knowledge capture and career paths. Toyota does this by the Chief Engineer role. The Chief Engineer at Toyota takes responsibility for the whole value chain of a particular product; from design to delivery. However, unlike a matrix organization; the Chief Engineer has to negotiate with the functional heads about what is needed from the functions to support the product. In this scenario it is the functional head, which has line responsibility and prioritizes the work schedules.

Methodology

This paper is derived from two studies that were conducted in The Netherlands (University of Twente) and the United Kingdom (Cardiff University), respectively. Both studies began with a review of existing literature on the topic of leadership in (Lean) change programs. In total 194 people participated in our combined studies. Of these, 32 were Senior Managers, and 49

were Middle Managers. Within the combined studies 109 of the participants were Lean change experts at different levels.

The Cardiff University program then interviewed thirty-two senior managers from four large manufacturing companies. Following the Critical Incidents Technique (Edvardsson & Roos, 2001; Flanagan, 1954), managers were asked to discuss, in their own words, their experiences of a recent successful and unsuccessful change program and to then to describe their perceptions of the reasons for success and failure.

Then, both studies engaged in a multi-round Delphi study (Keeney, Hasson, & McKenna, 2006) during which experts of Lean change programs selected key behaviors of highly effective leaders. Following, the experts openly discussed the validity, reliability, completeness and usefulness of the earlier Delphi findings (Keeney et al., 2006) in focus groups facilitated by the researchers (Morgan, 1996). We then both organized a post focus group audit in the form of a rating of the focus group outcomes. After this pilot study the Cardiff University research program compared the results of the findings to data collected from published studies to establish common ground and to identify any gaps in the literature (Found et al., 2005).

The University of Twente project had Lean change program experts nominate exemplary middle managers in Lean organizations based on the key behaviors for successful Lean leadership. All so nominated managers had started implementing the Lean principles in their organizations at a minimum six months earlier. With these six highly effective Lean middle managers, their superiors and their direct reports, we then conducted multi-source feedback interviews (Foster & Law, 2006) including, again, the Critical Incidents Technique as prescribed by Edvardsson and Roos (2001) and Flanagan (1954). Further, we had these respondents and the remaining direct reports fill out a 61-item behavioral leadership

questionnaire based on the Yukl taxonomy (Yukl, Gordon, & Taber, 2002), our Delphi results, the Balanced Leadership Questionnaire of Wilderom, Wouters and Van Brussel (2008), and the Multifactor Leadership Questionnaire (Den Hartog, Van Muijen, & Koopman, 1997), to protect external validity.

Findings and Discussions

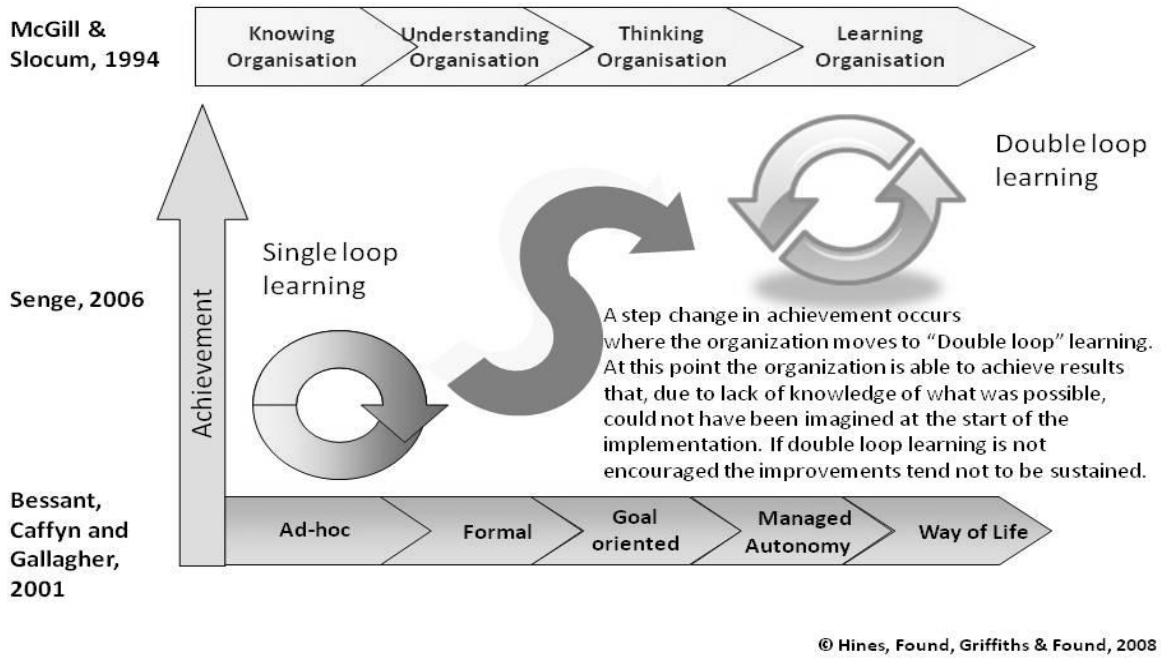
The detailed findings from Cardiff University and University of Twente studies can be obtained in Found and Harvey (2006) and Van Dun et al. (2008), respectively. A brief overview of the findings from both studies is also given in Appendix 1.

The findings of the University of Twente study show a significant learning curve through time for middle managers in sustaining the Lean philosophy in their organizations. 17 items of the BLQ showed a significant higher score for behaviors of middle managers that had started their organizational transition to the Lean principles more than one year earlier compared to managers of less than a year into the transition. As indicated by the Cardiff study, shown in Table 2 true Lean Leadership is about fostering a continuous learning environment for their team leaders. This is confirmed by the outcomes of the multi-source feedback interviews, where a majority of respondents named ‘asking for ideas’ to be the key to middle managers in sustaining Lean. Hence, a culture is created where middle managers and team leaders both learn from these ideas provided by both team leaders and operators. Within this environment the Lean Leaders are also able to adopt continuous learning themselves.

Cardiff University’s research into sustainable change identified that the factors that enable sustainability are subtly different from those of successful implementation. This was identified by Bessant et al. (1994) and confirmed by this study. One of the key observations in the Cardiff SUCCESS program was the recognition that organizational, or ‘Double Loop’

(Senge, 2006), learning was taking place at all levels of management during a sustained Lean implementation. We have illustrated the process that we observed by mirroring the Bessant, Caffryn and Gallagher's evolutionary model of continuous improvement behaviour (2001) to McGill and Slocum's classification of organizational learning (1994) (see Figure 1 below).

Figure 1. Evolutionary Framework of a Lean Transition



Source: (Hines et *al.* 2008)

The results from both studies, conducted independently, confirm that highly effective Lean leaders at all levels of the organization adopt and encourage double loop learning. This progression is essential to sustain the changes in the long term as, without this step change, there is always a danger that the Lean implementation never progresses beyond a tools approach to become a Lean philosophy within the organization.

Hence, both top and middle management need to adopt double-loop learning in order to improve their leadership style through time to sustain Lean within their organization.

Further, as the University of Twente findings show, we also conclude that leadership behavior can be taught and learnt.

Conclusion

As well as highlighting the managerial implications of our study we would like to conclude by identifying future research agenda. Further research, especially those of longitudinal in nature, can possibly be conducted into skills acquisition and enhancement of Lean managers (at senior and middle level) over time and generate a trajectory of their learning curves. More emphasis should also be given to the learning and changes in practice which constitute as part of what they do on a day-to-day basis (Fei, 2007). Having been explicitly clear at the outset of this paper, we regard both managers and leaders as a unified level of analysis. Future research may pay closer attention to the interaction between the two, and even with other levels of analysis (e.g. followers). Given that this study was conducted in a Western European context, it would be more meaningful to compare our findings with those from culturally different contexts, in order to generate a more general perspective on management and leadership skills in Lean organizations. This is to take into account the fact that managers and leaders increasingly interact with each other on a global-local continuum (Fei, 2007).

The implications for managers are clear that Senior Managers need to adopt and encourage double loop learning throughout the whole of the organization to sustain performance improvements in the long term. The only way that Lean becomes a philosophy, rather than a tools-based improvement program, is for Lean Leaders at all levels to exhibit the behaviors that encourage commitment throughout the whole organization to achieve the goals. A top-

down, bottom-up approach must ensure that the important group of middle managers is not excluded.

Our studies were conducted in both manufacturing firms as well as service organizations. Consequently, the combination of our studies is of even higher importance in our ambition to build a general consensus on Lean leadership.

References

Bass, B. M., & Avolio, B. J. (1990). Developing Transformational Leadership: 1992 and beyond. Journal of European Industrial Training, 14(5), 21-28.

Bass, B. M., & Avolio, B. J. (1993). Transformational Leadership: A Response to Critics. In M. M. Chemers & R. Ayman (Eds.), Leadership Theory and Research: Perspectives and Directions. San Diego: CA: Academic Press.

Bass, B. M., & Avolio, B. J. (1994). Improving Organizational Effectiveness Through Transformational Leadership. London: Sage Publications.

Bateman, N. (2005). Sustainability: the elusive element of process improvement. International Journal of Operations & Production Management, 25(3), 261-276.

Bessant, J., Caffyn, S. & Gallagher, M. (2001). An evolutionary model of continuous improvement behaviour. Technovation, 21, 67-77.

Bhashin, S., & Burcher, P. (2004). Lean viewed as a philosophy. Journal of Manufacturing Technology Management, 17(1), 56-72.

Bryman, A. (1992). Charisma and Leadership in Organizations. London: Sage.

Den Hartog, D. N., Van Muijen, J. J., & Koopman, P. L. (1997). Transactional versus transformational leadership: An analysis of the MLQ. Journal of Occupational and Organizational Psychology, 70(1), 19-34.

Edvardsson, B., & Roos, I. (2001). Critical incidents techniques. Toward a framework for analysing the criticality of critical incidents. International Journal of Service Industry Management, 12(3), 251-268.

Emiliani, M. L. (2003). Linking leaders' beliefs to their behaviors and competencies. Management Decision, 41(9), 893-910.

Fei, F. (2007). Resourcing change: a grounded theory explaining the process by which managers address challenges in their initiation of change as learning at work, unpublished doctoral thesis, School of Management, University of Bath.

Fine, D., Hansen, M. A., & Roggenhofer, S. (2008). From Lean to lasting: Making operational improvements stick. The McKinsey Quarterly(November).

Flanagan, J. C. (1954). The critical incident technique. Psychological Bulletin, 51(4), 327-358.

Foster, C. A., & Law, M. R. F. (2006). How many perspectives provide a compass? Differentiating 360 degree and multi-source feedback. International Journal of Selection and Assessment, 14, 288-291.

Found, P. A., & al., e. (2005). An Exploratory Study of the Keys to Successful and Sustainable Change Management. CUIMRC Working Papers.

Found, P. A., & Harvey, R. (2006). The role of leaders in the initiation and implementation of manufacturing process change. The International Journal of Knowledge, Culture & Change Management, 6, 35-46.

Found, P. A., & Harvey, R. (2007). Leading the Lean enterprise. IET Engineering Management, 17(1), 40-43.

Heymans, B. (2002). Leading the Lean enterprise. Industrial Management, 44(5), 28-33.

Hines, P., Lemming, R., Jones, D. T., Cousins, P., & Rich, N. (2000). Value Stream Management: Strategy and Excellence in the Supply Chain. Harlow: Financial Times Prentice Hall.

Hines, P., Found, P., Griffiths, G. and Harrison, R., (2008). Staying Lean: Thriving not just surviving. Cardiff: Lean Enterprise Research Centre

Holweg, M. (2007). The genealogy of Lean production. Journal of Operations Management 25(2), 420-437.

Huczynski, A. and Buchanan, D. (2001). Organisational Behaviour: An Introductory Text. Harlow, England: Financial Times/Prentice Hall.

Huy, Q. N. (2001). In praise of middle managers. Harvard Business Review, 79(8), 72-79.

Huy, Q. N. (2002). Emotional Balancing of Organizational and Radical Change: The Contribution of Middle Managers. Administrative Science Quarterly, 47(March), 31-69.

Keeney, S., Hasson, F., & McKenna, H. (2006). Consulting the oracle: ten lessons from using the Delphi technique in nursing research. Methodological issues in Nursing Research, 53(2), 205-212.

Kotter, J. P. (1990). A Force for Change: How Leadership Differs from Management. New York: Free Press.

Liker, J. K. (1996). Becoming Lean. New York: Free Press.

Liker, J. K. (2004). The Toyota Way - 14 Management Principles from the World's Greatest Manufacturer. New York: McGraw-Hill.

Liker, J. K., & Meier, D. (2006). The Toyota Way Fieldbook: A Practical Guide for Implementing Toyota's 4P's. New York: McGraw-Hill.

Lucey, J., Bateman, N., & Hines, P. (2005). Why major Lean transitions have not been sustained. Management Services, 9-13.

McGill, M. E. & Slocum, J. W.Jr. (1994). The Smarter Organization: How to build a business that learns and adapts to marketplace needs. New York: John Wiley & Sons.

Morgan, D. L. (1996). Focus groups. Annual Review Sociology, 22(1), 129-152.

Politis, J. D. (2005). Dispersed Leadership Predictor of Work Environment for Creativity and Productivity. European Journal of Innovation Management, 8(2), 182-204.

Pullin, J. (2002). Blazing a Trail Through Change Management. Professional Engineering, 15(17), 40-41.

Savolainen, T. (2000). Leadership strategies for gaining business excellence through total quality management: a Finnish case study. Total Quality Management, 11(2), 211-226.

Seddon, J. (2005). Freedom from command & control: Rethinking management for Lean service. New York: Productivity Press.

Senge, P. (2006). The Fifth Discipline: The Art and Practice of the Learning Organization. Revised edition. London: Random House Business Books

Swank, C. K. (2003). The Lean service machine. Harvard Business Review, 81(10), 123-129.

Van Dun, D. H., Hicks, J. N., Wilderom, C. P. M., & Van Lieshout, A. J. P. (2008, June). Work Values and Behaviors of Middle Managers in Lean Organizations: A New Research Approach Towards Lean Leadership. Paper presented at the 11th Bi-annual

Conference of the International Society of the Study of Work and Organizational Values, Singapore.

Waters, M., & Bevan, J. (2005). Journey to Lean. IET Engineering Management, 15(4), 10-13.

Wilderom, C. P. M., Wouters, M., & Van Brussel, J. (2008). Positive attitudes toward performance measurement through balanced leadership, professionalism and team trust. Submitted to: British Journal of Management.

Womack, J. P., & Jones, D. T. (1996). Lean thinking: Banish waste and create wealth in your corporation. New York: Simon & Schuster.

Womack, J.P. & Shook, J. (2008). Lean Management and the Role of Lean Leadership. http://www.lean.org/Events/WebinarHome.cfm

Womack, J.P. (2008). The Power of Purpose, Process and People. http://www.lean.org/Events/WebinarHome.cfm

Yukl, G. A., Gordon, A., & Taber, T. (2002). A hierarchical taxonomy of leadership behavior: integrating a half-century of behavior research. Journal of Leadership & Organizational Studies, 9(1), 15-32.

Appendix: 1 Research findings from both Cardiff University (UK) and University of Twente (The Netherlands)

Table 2 Factors enabling successful change and sustainable change from the Cardiff University study

Factors enabling *successful* change	% of respondents who rated this either 1, 2 or 3 in importance (where 1 is most important)	Factors enabling *sustainable* change	% of delegates who rated this either 1,2 or 3 in importance (where 1 is most important)
Leadership	90%	Leaders who "Walk the talk"*	70%
Clear need for change	60%	Measurement (KPIs)*	50%
Buy-in	70%	Reward & recognition*	80%
Planning & methodology	40%	Accountability	30%
Communication	20%	Continuous Improvement	20%
Stakeholder identification	10%	Communication / training	20%
Budget (inc. resources, time etc.)	10%	Removal of resistance	20%
		Standardization of process	10%

Source: (Found and Harvey, 2006)

Table 3 Outcomes Behavioral Leadership Questionnaire (on a 7-point Likert scale where 1 means 'never' and 7 'always') from the University of Twente study

	<1 year (N=16)	*>1 year (N=27)*	*Total (N=43)*
Actively listens attentively to a person's concerns	5,25[a] (1,44)[b]	6,30* (0,78)	5,91** (1,17)
Builds trust	5,38 (1,26)	6,19* (0,79)	5,88* (1,05)
Actively provides support and encouragement	5,31 (1,25)	6,11* (0,70)	5,81 (1,01)
Encourages/facilitates learning by team members	5,44 (0,96)	6,11* (0,75)	5,86 (0,89)
Leads by example and models exemplary behavior	5,19 (1,11)	6,11* (0,80)	5,77** (1,02)
Expresses confidence team can attain objectives	5,38 (1,09)	6,07* (0,96)	5,81 (1,05)

Source: Van Dun et al. (2008)

[a] Mean, [b] Standard deviation, * p<.05; ** p<.10

Note 1. Last column describes Kruskall-Wallis test

Note 2. 43 respondents completed our Behavioral Leadership Questionnaire (BLQ): 26 males and 18 females. This included six middle managers and four of their supervisors. Incorporated in the results were the responses of two internal Lean advisors and a total of 31 subordinates. The response rate was 89.59%. After deleting one item, BLQ's Cronbach's alpha increased from α=0.927 to α=0.930. Table 3 shows the six items with the highest total means (see the last 'Total (N=43)' column of Table 3). These descriptive statistics show that, in firms that sustain Lean, the highly effective middle managers relatively often exhibit the behaviors listed in Table 3. We explored the between-case differences in the BLQ-responses. Based on a Kruskall-Wallis test, five BLQ items showed significant inter-group variances at p<.05, namely 'builds trust,' 'trains and teaches the Lean principles by doing,' 'designs and coaches teams,' 'cooperates effectively with his/her employees,' and 'delegates sufficient tasks to his/her employees.' T-tests did confirm our following proposition: An important finding here was that the outcomes for the group who started a Lean implementation > 1 year ago are higher that the outcomes for the group who started a Lean implementation < 1 year ago. This proposition appeared to apply (p<.05, independent samples 1-tailed T-test) for 17 of the 60 individual items.