Perceptions of Lean Six Sigma: A Multiple Case Study in the Financial Services Industry

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From 2001 onward, books and papers about the application of Lean Six Sigma (LSS) in service industries describe typical LSS deployment characteristics, such as the human element. The objective of this paper is to identify which LSS attributes affect employee and management attitudes and how the contextual frame affects this relation during the LSS change initiative. This study was conducted in the financial services industry. The research examines how the attributes of LSS affect attitude in terms of acceptance, contribution, or rejection of the LSS change initiative by managers and employees. A thorough qualitative multiple case study comprising five companies and 25 interviewees is seeking to answer how the attitudes toward the LSS change initiative differ per case. After exhaustive within- and cross-case analysis, theoretical and practitioner conclusions are drawn and the three main findings are discussed: 1) of all aspects of LSS, cost saving is the likely candidate to receive long-lasting attention; 2) the tendency to simplify the accounts of the LSS change initiative forms a fertile basis for misconceptions and extreme interpretations; and 3) the drive required to keep the LSS initiative going comes from a gradual and incremental implementation of LSS. The implications for LSS practitioners and managers implementing a LSS change initiative are discussed.

Key words: case study, deployment, financial industry, Lean Six Sigma, Lean, perception, Six Sigma

INTRODUCTION

Lean Six Sigma (LSS) is a methodology focused on improving operational efficiency and effectiveness for companies in various industries (George 2003). While the method has its origins in manufacturing, it is increasingly used in service organizations as well. From 2001 onward, books and papers have been written on this subject; some of them describe typical LSS deployment issues for service organizations such as a lack of tangible output, a lack of a process view of work, the scarce availability of useful measurements, and a greater human element (Antony et al. 2007). Today, the academic literature has established a vast amount of research on determinants for successful implementation of LSS change for competitive advantage (Nonthaleerak and Hendry 2008; McAdam and Lafferty 2004). Apart from substantial technical and "how-to" bodies of literature, scholarly reviews of lean and Six Sigma implementation have mostly focused on financial and operational performance gains and stakeholder effects (Fullerton and Wempe 2009; Behrouzi and Wong 2011) for lean (Lewis 2000) and Six Sigma (Parast 2011). The number of publications that study employees' feelings and perceptions during and after LSS implementation (the human element as Antony et al. (2007) specifically notes for service organizations) are few (Shafer, Tepper, and Meredith 1995; Losonci, Demeter, and Jenei 2011). The literature on lean change success in manufacturing dictates that in the majority of cases, the main

barriers to achieving successful lean change are related to the human element; insufficient communication and employee opposition are among other important reasons (Bhasin 2012). Nevertheless, the results from studies on lean and Six Sigma perception by employees are scarce, contradictory, and inconsistent, though very relevant for lean and Six Sigma change success (Vidal 2007). There seems to be a knowledge gap in understanding LSS perceptions within the service industry. The objective of this research is to study how manager and employee attitudes in terms of acceptance of, contribution to, or rejection of the LSS change initiative are determined. The focus is on two possible variables. The first is which LSS attributes are experienced and how these LSS attributes affect employee and management attitude. The second is how the contextual framing affects the relation between LSS attributes and attitudes during the LSS change initiative. Thereby, useful insights for LSS practitioners aiming at LSS deployment are generated.

This study focuses on the financial services industry, with the addition of a case from healthcare as a control variable, as efficiency gains are considered to be large in the financial sector, and more and more financial institutions are adopting LSS (De Koning, Does, and Bisgaard 2008a; Delgado, Ferreira, and Branco 2010).

The next section further introduces the discussion on perceptions of LSS and the key concepts involved. In this section, the concepts of framing of the change initiative by employees and managers and ideological positioning of these employees toward the change initiative are used to structure the search for perceptions of LSS. The main features of lean and Six Sigma separately, as well as their joint operation as defined for this study, are stated. The third section presents the methodology and the research strategy. The fourth section presents the results, and the fifth section provides discussion and managerial conclusions.

LITERATURE REVIEW

As mentioned previously, LSS is a method that can drive the improvement of operational efficiency and effectiveness of organizations in various industries (George 2003). Lean and Six Sigma combined prove to be an effective improvement method. Lean does not entail the reduction of variation and statistical control. Six Sigma is not developing a link between quality and speed. Therefore, the combined instrument of LSS can lead to greater efficiency and better quality in the financial services industry (De Koning, Does, and Bisgaard 2008b).

Attitude Toward Lean Six Sigma Change Initiative

There are various challenges when applying LSS in the service sector, as described by Antony et al. (2007). Data collection issues, dealing with highly dynamic processes, and presenting analysis results using the service language rather than the statistical language to gain support for the recommendations are the most prominent challenges. The human element in service organizations is of great importance in achieving LSS objectives: 1) human behavioral characteristics such as courteousness, eagerness to help, honesty, and so on have a major influence on service processes that determine the quality of services provided to customers; 2) the resistance to change in a service-focused environment is comparatively higher than in a manufacturing setting due to the high involvement of soft issues, such as human behavior, friendliness, honesty, courtesy, and so on; 3) service processes in general are much more dependent on human and organizational change than manufacturing process change. Changing a machine's parameter settings is quite different than training staff or adjusting work procedures or tasks. Research into employee and manager perceptions has been performed in the LSS-related fields of quality improvement (see Boiral [2003] for ISO 9000 and Zbaracki [1998] for TQM); however, there has been little research on the perceptions of LSS change in the service industry, including research at various organizational levels (Shafer, Tepper, and Meredith 1995). Losonci, Demeter, and Jenei (2011) note that the feelings and perceptions of those involved in an LSS deployment have remained unreported. The authors expect perceptions of lean

success to differ, as the process characteristics differ from case to case, thereby endorsing the importance of lean and/or Six Sigma attributes. A review of 12 quantitative studies in manufacturing published by Hasle et al. (2012) on the subject of perceptions noted that both positive and negative effects of lean and/or Six Sigma have been reported. Much depends on employee framing of the context, implementation, and application of LSS change.

Attitude In research done on employee responses to a merger, Howard and Geist (1995) captured the concept of ideological positioning (attitude). Ideological positioning "reveals individual beliefs, values, and perceptions about cultural norms that define and/or clarify their position on an issue." Ideological positioning occurs "as organizational members attempt to rationalize and explain the choices they make in response" to a change initiative. The ideological positioning concept moves on two axes: acceptance vs. rejection (positive responses versus negative responses) and active vs. passive (attitudes of being empowered vs. attitudes of powerlessness). Differences in attitudes of the LSS change initiative between hierarchical layers in organizations are held as important drivers for unintended consequences of change initiatives (Harris and Ogbonna 2002; Jian 2007). Therefore, attitudes between managers and employees are compared. These differences hold true for cultural changes or restructuring efforts especially (McKinley and Scherer 2000).

Furthermore, narratively constructed attitudes toward change at an individual level have been shown to significantly affect change outcomes. The individual attitudes of top management may have a more immediate effect on the change initiative compared to the attitudes of individual employees (Choi and Ruona 2011). As attitude will most likely result in corresponding behavior, attitudes close to active acceptance are more desirable than attitudes close to passive rejection in LSS change initiatives.

Behavior The theory of reasoned action (TRA) focuses on theoretical constructs concerned with individual motivational factors as determinants of the likelihood of performing a specific behavior (Ajzen and Fishbein 1980). TRA states that the most important determinant of behavior is behavioral intention. A direct determinant of an individual's behavioral intention is his or her attitude toward performing the behavior. Thus, a person who perceives that positively valued outcomes will result from LSS change (for example, better working conditions or less rework without loss of paid work) from performing contributing behavior (for example, engage in process optimizations and standardize daily work) will have a positive attitude toward that behavior (contributing). Conversely, a person who perceives that negatively valued outcomes will result from LSS change (for example, loss of autonomy) from the contributing behavior (for example, participating in daily improvement sessions) will have a negative attitude (and thus not apply contributing behavior). Hence, TRA holds that employee perception of LSS change explains attitude toward behavior and consequently actual behavior, which will have a significant impact on LSS change success, as argued by Antony et al (2007). Following the existing literature on employee attitude and corresponding behavior, the following research questions are proposed:

- Research question 1a: How do the attitudes toward the LSS change initiative differ per case?
- Research question 1b: How do the attitudes differ between managers and employees?

Perceived Lean Six Sigma Attributes

The concepts of lean and Six Sigma are introduced to help distinguish which LSS attributes carry the most weight in management and employee perception of the change initiative. How and why lean and Six Sigma are more effective while applied as LSS together is a separate debate that is thoroughly covered by George (2003), among others.

Lean Since Womack and Jones (2003) introduced the notion of lean thinking, many interpretations of the lean philosophy have been discussed (Bhasin and Burcher 2006; Bicheno and Holweg 2009; De Mast et al.

Figure 1 List of LSS attributes that define LSS as a methodology (Pettersen 2009; Kwak and Anbari 2006)

Definition of Lean Six Sigma attributes	Description
Definition of Lean (Pettersen 2009)	
Just in time (JIT)	Producing when and what is needed by customer pull
Resource reduction	Nonvalue-adding steps of a process, often cited as the seven forms of waste
Improvement strategies	Participation in improvement circles and finding root causes of problems
Defects control	A strong focus on quality and eliminating root causes of defects
Standardization	Standardization and 5S practices, resulting in continuous improvement
Scientific management	Rational allocation (or reduction) of resources in a process
Human relations management	Bottom-up participation and a basic understanding of lean principles
Supply chain management	Active supplier involvement and management
Definition of Six Sigma (Kwak and Anbari 2006)	
TQM	Corporate culture in which all employees actively participate in continuous improvement (Dahlgaard, Kristensen, and Kanji 1998)
Customer focus	Definition and measurement of customer requirements and expectations
Additional metrics	Advanced statistical data analysis tools to measure performance
Financial results	Measured and reported financial results
Structure improvement method	Following the DMAIC procedure for improvement projects
Project management structure	Organized according to project management methodology and tools

2012; Slack, Chambers, and Johnston 2010). Pettersen (2009) distilled the collective terms that apply to all variants of lean and concluded that there is sufficient convergent validity for the term "lean" to carry meaning as an independent concept. The result is a list of six essential and two less vital concepts (see Figure 1).

Six Sigma Lists of Six Sigma's unique attributes vary somewhat among authors, but Kwak and Anbari (2006) cite a strong customer focus, data analysis tools, a focus on financial results, and a useful project management structure. Although the use of metrics to reduce variation is far from unique to Six Sigma, Schroeder et al. (2008) assert that specific metrics such as defects per million defect opportunities (DPMO), critical to quality (CtQ), and process sigma measurements are innovations introduced by Six Sigma. Another important aspect of Six Sigma is the structured improvement method of define, measure, analyze, improve, control (DMAIC) for process improvement, and define, measure, analyze, design, verify (DMADV) for process design—something that was left much more vague in prior quality management methods (Zu, Fredendall, and Douglas 2008).

From these attributes, the "formula" for LSS can be stated (see Figure 1). The integration of lean and Six Sigma is to combine Six Sigma's project management and DMAIC roadmap as a general framework for problem solving and process improvement with lean standard solutions and mindset. For a detailed description of lean management, Six Sigma, and their complementary characteristics, see Bendell (2006).

Following existing literature's LSS attributes known to date, the following research question is proposed:

- Research question 2: How do the perceived LSS attributes differ per case?

Framing of the Lean Six Sigma Change Initiative

In order to study and explain why perceptions of LSS change differ per employee, it is crucial to capture how

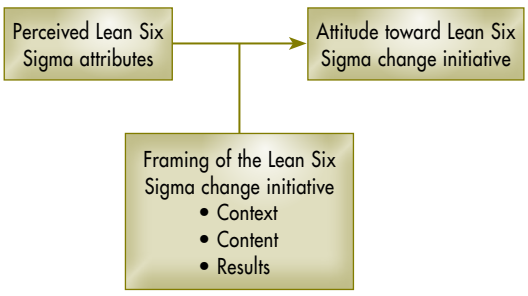
employees frame the LSS change initiative. The concept of framing the context and content captures the differences in meaning between groups or individuals and therefore allows for situational comparisons (Dewulf et al. 2009). Context frames relate to the way actors view the context and reasons behind the change initiative. Content frames regard the main goals of the change initiative. Content frames help one understand which practices are dominant in the perceptions of employees and management. Following the existing literature on the framing of employee attitudes, the following research question is proposed:

- Research question 3: How does the framing of the LSS change initiative differ per case?

METHODOLOGY

The objective of this paper is to explain employee and manager attitudes toward LSS change initiatives by studying which LSS attributes are perceived by employees and managers of study. Manager and employee framing of the LSS change initiative's context and content is believed to moderate the perception of LSS attributes. Hence, framing affects how the LSS attributes are perceived and results in a specific attitude toward the LSS change initiative (see Figure 2).

Figure 2 Conceptual model of the research



Research Strategy

The authors' research is set up as a qualitative multiple-case study. As this study attempts to explain for phenomena under different conditions, the multiple-case setup is particularly suitable (Miles and Huberman 1994). The qualitative nature of the research is reflected in the research questions, where there are many more variables of interest than data points available (Yin 2003). In methodological terms, the study uses "locally grounded" or "thick descriptions" suited for finding meaning rather than statistical relations (Miles and Huberman 1994) and is therefore considered "theory generating" after Ketokivi and Choi (2014). The study follows the structure as proposed by Eisenhardt (1989). Within-case analysis provides detailed write-ups for each case to get intimately familiar with the cases and discover patterns. Then, the authors search for cross-case patterns by selecting categories and looking for within-case similarities and differences. Finally, they compare the findings with external theory, as conflicting theories offer an opportunity by invoking creative thinking (Eisenhardt 1989).

Transparency and repeatability are dealt with in accordance and contain, among others: 1) a clear description of sampling strategy; 2) coding procedure; and 3) enclosure of within-case analysis (Barrat, Choi, and Li 2010). In addition to the previous point, validity is addressed by means of structuring the article according to the chain of evidence (Stuart et al. 2002). Finally, all the interviews are thoroughly documented in accordance with the guidelines for reproducible research and are available as supplementary material (Voss, Tsikriktsis, and Frohlich 2002). The transcripts amounted to 265 pages of plain text.

Four firms within the financial services industry and one hospital participated in this study. Company 1 (C1) is a medium-sized Dutch retail and wholesale bank. An LSS program was first carried out successfully in its operations unit, after which the entire company engaged in a full-scale LSS change program executed by Black Belts. For this case study in the operations department, the change initiative started in 2010. Company 2 (C2) is a large Dutch pension funds administrator. The organization is part of a much larger corporation, with activities across Europe. An LSS program was carried out successfully by Black Belts in another corporate business unit prior to implementation within this unit. For this case study, the change initiative started in 2008. Company 3 (C3)

is a Dutch subsidiary of a European life insurance company, and is a relatively small player on the Dutch market. The organization employs about 450 people. Implementation of an LSS change by Black Belts started in 2009. Company 4 (C4) is a Dutch general hospital. It is one of the larger general hospitals in the Netherlands, employing almost 3,000 people (including about 200 medical specialists) at several hospital locations and laboratories. Implementation of LSS started in 2009 by training middle management to become Green Belts. Company 5 (C5) is a medium-sized pension and life insurance company. The firm employs about 700 people and is a subsidiary of a larger corporation. The organization started implementation by LSS Black Belts in 2007.

All five companies in this research are characterized by the fact that they all began implementing LSS. The first project-based phase, in which pilot projects are started with the expectation of significant impact with effort only from project leaders, is present in all five companies. Then all five companies started projects in core processes or service segments, training more Black Belts for these projects. Senior management monitored results and presented a clear vision on the application of LSS. Despite the similarities, these companies do hold meaningful contrasts for theoretical reasoning (Yin 2003). Differences between the cases exist in terms of industry contingencies (for example, power of employees over managers, familiarity with organizational change), LSS approach (for example, bottom up vs. top down, use of external consultants), and intensity of the LSS change initiative.

For every participating company, five interviews were arranged with people at different organizational levels who had recently been involved with or confronted with an LSS change initiative. Three types of respondents were incorporated: managers, employees, and Black Belts. The interview setup intended to invoke a narrative account of the LSS change initiative by the semi-structured nature (interview questions available as supplementary material). The transcripts were coded in two iterations (transcripts are available as supplementary material). In the first coding phase, all transcripts were coded for attitudes, frames, and LSS attributes. To check and improve accuracy, a second round of coding was done by a second researcher.

A "discourse" label was added, signalling frames of how "others" viewed the LSS change initiative in general terms from the interviewee's point of view. The discourse label was assigned to any passage where the interviewee made statements about the views of colleagues, superiors, or subordinates regarding the change initiative.

RESULTS AND DISCUSSION

The analysis is structured according to attitude toward the LSS change initiative, perceived LSS attributes, and framing of the LSS change initiative. The resulting references made per category of study are displayed per company and are divided into management, Black Belt, and employee results (see Figure 3). The displayed references can be direct or indirect (discourse) references. For example, managers in C2 have eight rejecting references. The content of these references does not only apply to their own attitudes, but also to what they believe are the attitudes of others (the discourse).

The case segments are combined into short "within-case" descriptions of each case, highlighting the main findings per case in Figure 4 (Eisenhardt 1989; Miles and Huberman 1994). The within-case display combines the narratives of managers and Black Belts for two reasons. First, some case managers also had the role of Black Belt. Second, the differences between the managers' and Black Belts' attitudes appeared to be limited (see, for example, Figure 3). The subsequent cross-case analysis highlights the most interesting findings and leads to the search for cross-case patterns and differences to answer the aforementioned research questions (Eisenhardt 1989).

Attitude Toward Lean Six Sigma Change Initiative

Overall the management group is accepting of the LSS change initiatives (see C2 for an exception). Management mentioned how LSS change can help them meet their objectives by using tools such as

Figure 3 Quantitative within-case results

		Company 1			Company 2			Company 3			Company 4			Company 5		
Roles		Managers	Black Belts	Employees	Managers	Black Belts	Employees	Managers	Black Belts	Employees	Managers	Black Belts	Employees	Managers	Black Belts	Employees
Number of respondents (N=25)		2	1	2	2	0	2	2	2	2	3	0	2	1	1	3
Attitudes (# categories mentioned per role)																
Active		2	3	3	4			5	3	3	5			2	1	3
Acceptance		4	5	6	3		2	1	1	1	3		1		1	3
Passive			2	1	3		4	1	1	2	1			1	1	2
Rejecting		1	1	1	8	1	6	1					3			2
Perceived LSS Attributes (# categories mentioned per role)																
Six Sigma	*Just in time practices*															
	Resource reduction	3	4	1				1	2	3	3		1		1	2
	Improvement strategies	5	2	4	1		1	2	5	5	7		2	2	3	7
	Defects control										3					
	Standardization	3	1	2	2		2	1	1		4		1		1	7
	Scientific management	3	1	2	1		2	1	1	5	9		2	1	1	2
	Human relations management	6	3	6	5		3	3	4	3	8		5	3	2	1
	Supply chain management	8		1	1					4	5		1		1	2
Lean	*TQM*	14	2	1	3		2	6	12	8	17		5	1	6	2
	Customer focus	2	1	1	1		2	3	3	7	5		3	2	2	2
	Additional metrics	10	1	3	7		4	3	6	1	3			1	2	
	Financial results				2		2			1	3			2	2	2
	Structured improvement method	3		2	2		1	1	1	1	5			1	4	3
	Project management structure	7	1	2	5		4	1	2	2	5				2	1
Framing of LSS Initiative (# categories mentioned per role)																
Content	*Pressures to reduce costs*			2	1		1	2	2	2	3					
	Low customer satisfaction	2	1		2		2							1	1	2
	Organizational improvement	2							1				2			
Context	*Improving service and quality*	7	5	8	2		8	8	9	8	13		7	5	4	14
	Reducing the cost-base	9	4	8	9		9	8	8	5	11		9	5	4	11
	Improving employee well-being	7	4	6	3		6	8	7	8	7		7	3	3	13
	Improving employee efficiency	4	4	9	8		9	9	8	5	14		9	5	4	15
	Increase process reliability				7		6	6	8	8	8		4	5	3	14
	Increase process flexibility				5		3	9	8	4	9		8	4	5	10
	Increase speed of delivery				6		8	9	7	8	12		9	5	5	14

Figure 4 Qualitative within case descriptions

	Attitudes (Toward LSS change initiative)	**Perceived LSS Attributes** (During the LSS change initiative)	**Framing of LSS Initiative** (Context/Content of initiative)
Company 1 *Managers and Black Belts*	• Accepting and active • Management doubts at deployment and fear of loss of leadership control	• Telling the story and leading the change by exemplary behavior • Focus on additional metrics	• Low customer satisfaction and consequently cost reduction • Employee satisfaction
Employees	• More accepting than active • Transparency increased work stress	• Bottom-up approach in structured improvement • Opportunity to learn and contribute	• Cost reduction by means of process optimization • Improving employee efficiency
Company 2 *Managers and Black Belts*	• Accepting although critical of the LSS methodology • Strong focus on realizing company objectives with LSS	• Insight in performance metrics perceived as blessing • Clear project management structure	• Initiated to improve customer satisfaction • Strong focus on cost reduction "always FTEs"
Employees	• Rejecting the LSS change initiative, perceived introduced attributes as waste of time	• LSS expert support perceived as absent • LSS in-house training perceived as insufficient	• Low customer satisfaction • Improved efficiency should lead to cost reductions (a means to reduce cost)
Company 3 *Managers and Black Belts*	• Accepting and active • Lack of vision caused chaotic implementation • Fun to solve the problems	• Searching for root causes of problems with employees • Voice of the customer research put forward	• Trend to restructure and optimize in financial industry • Focused on realizing efficiency gains
Employees	• Accepting • Desire to see LSS further implemented in the organization	• Knowing what customer value is remains vague • Measurements are rough estimates due to lack of data	• Assignment from local management to start • Focused on process improvements
Company 4 *Managers and Black Belts*	• Accepting • LSS only one of many management instruments	• Difficulty in adopting each other's best-practices • Management received LSS training to execute projects	• Increased competitive pressure on market • Improved service, quality, and employee efficiency
Employees	• Passive • Initiative primarily focused on middle and higher management	• Measurement of process data is perceived more important than their opinion • No training, less involved	• Reputational reasons as main driver • Focus on cost reduction and employee efficiency
Company 5 *Managers and Black Belts*	• Active • Customer focus achieved through application of LSS	• Management involvement is important though doesn't participate in LSS initiative • Received LSS training	• Management decision • To enhance reputation • Reducing a certain amount of man-hours per year
Employees	• Accepting and active • "Inspiring" to improve processes together	• Team worked step by step toward a solution • Unify service by standard operating procedures	• Management decision • Reducing a certain amount of man-hours per year • Personal savings targets

problem solving and integrating the voice of the customer within the organization. The managers' doubts relate to factors that are not controllable but must be managed by them (for example, little control over program deployment, the program focus on data interpretation/financial measurement instead of trusting management experience, the pace and structure of LSS change implementation, and the skill level of Black Belts).

The employees' group has a passive acceptance/attitude about the LSS change. Rejection of LSS change is passive and not active (see employee references of C2 in Figure 3), while acceptance is active. C5 employees are actively accepting of LSS, stating that the aspect of improving processes together with colleagues is "inspiring." C1 employees have an accepting, though not active, attitude toward LSS change. They perceive the LSS change as possibly improving one's work,

although it increased work stress for the employees due to improved performance transparency. C3 and C4 employees have an accepting though passive attitude toward the change initiative. C3 employees agree that it would be good to implement LSS further and more formally in the organization, feeling that management support for the initiative is lacking and the LSS work methods are fading away. C4 employees cite the LSS change as providing opportunity for them to show and develop skills they would normally be unable to access, although they were only generally aware of what the program should achieve. C2 employees have a passive rejection attitude and claim that required daily activities are a waste of time. They indicated that if LSS change implementation would stop today, everyone would be relieved.

Research question 1a: How do the attitudes toward the LSS change initiative differ per case? Almost all managers are accepting of the LSS change, although some are active and some are passive. More in-depth analysis revealed that in all cases, when managers talk about each other's attitudes, they reference the passive attitudes of others. This may be a signal of professional acceptance, where no personal motivation is felt. From this functional perspective a manager cannot be against LSS once it is deployed. This interpretation is supported by the observation that interviewed managers indicated that other managers have less acceptance, while employees indicated that their managers probably accept LSS. Management is simultaneously subject to, as well as responsible for, co-implementing the LSS quality improvement discipline, so a passive or rejecting attitude would hinder the success of the implementation (Boiral 2003).

Research question 1b: How do the attitudes differ between managers and employees? Employees' attitudes vary more than managers' attitudes. Nevertheless, people who oppose the LSS change remain passive rather than protest. Both employees and managers indicate that most employees, when fearful of losing their jobs, would prefer to not be part of and/or to not understand the LSS change initiative (that is, a passive or rejecting attitude).

Perceived Lean Six Sigma Attributes

Four attributes are mentioned most often: the management involvement aspect of total quality management (TQM) (C1, C3, C4, and C5), human relations management (C1, C2, and C4), improvement strategies (C1, C3, and C5), and additional metrics (C1 and C2). Scientific management (C4), standardization (C5), project management structure (C2), and customer focus (C3) are mentioned only sporadically. However, just in time (JIT) (C1, C2, C3, C4, and C5) and defects control (C1, C2, C3, and C5) are not mentioned at all (see Figure 3).

Management involvement One element of TQM—management involvement—resulted in clear differences in perception by management and employees. For C1, setting direction and pace are examples of continuous improvement and are perceived by management as their role in the LSS change process. The Black Belt focused on LSS change on the workshop floor and employees perceived lower management involvement only in executing the LSS tooling for the change. C3 management perceives the organization as too undetermined to make the LSS change into a lasting success. However, C3 Black Belts perceive a culture of continuous improvement among employees, although they think management involvement in terms of leadership and LSS knowledge is lacking. C3 employees perceive limited management involvement and are not really sure whether they are expected to continue LSS change. At C4 top management is perceived as determined to implement LSS, while middle management is perceived as not involved. Employees perceive that there is a need for a wider commitment toward LSS change, which should be reinforced by management. C4 employees perceive a significant "not-invented-here" mentality that hinders LSS success. At C5, the manager, the Black Belt, and the employees indicate that management involvement is important though management doesn't participate in LSS change (although they do "allow" it).

Human relations management At C1, management and the Black Belt perceive a bottom-up approach to LSS change and employees describe

how the bottom-up character created the opportunity to be involved and share ideas. Employees perceive involvement by starting with small-scale projects and increasing effort, while in the meantime receiving training in LSS tooling. At C2 both the in-house training program and the in-house LSS expertise were negatively mentioned. Still, the continuing effort to train employees at various levels and ingrain certain daily habits and activities is considered an important aspect of the LSS program. C4 managers receive LSS training (Green Belt) to be able to execute LSS change projects. Employees perceive the LSS change as projects that are being executed by management and favor a different program, which integrates employee participation.

Improvement strategies At C1, improvement ideas are generated by employees in small steps in a learning-by-doing fashion. Management perceives this as something that needs constant attention. Employees describe that new ideas for improvement are less easily generated. At C3, management and Black Belts perceive the search for root causes for problems, together with the employees, as a continuous process. Employees perceive improvement strategies as defining the standard and looking for ways to improve this standard with a pragmatic approach, without any structure. C5 respondents indicate the pleasure in getting voluntarily together in a multidisciplined team (improvement strategy). By starting with a joint problem indication, the team worked step by step toward a solution (structured improvement method). The problems were manageable, and because of representation of all departments concerned, decision making was fast and results became quickly visible.

Additional metrics At C1, additional metrics are mentioned in the discussion about the data in the daily huddle, the so-called performance dialogues. The perception is that people can learn from each other, but data are a burden, as they require an explanation for worse or better performance. At C2, looking at individual and team performance is described as a blessing for management but is described as extra work for management by the team level.

Research question 2: How do the perceived LSS attributes differ per case? Four attributes are mentioned most often, being the management involvement aspect of TQM, human relations management, improvement strategies, and additional metrics. These findings align with previous research. These studies had the objective of finding critical success factors (CSFs) for LSS improvement projects (Coronado and Antony 2002; Brun 2011) and addressed: 1) management commitment and support for projects, training, selection, and prioritization of projects: 2) the link of LSS to human resource management; 3) structured approaches to project execution; and 4) a focus on metrics. In this study, scientific management, the use of standards, project management structures, and customer focus are less frequently perceived and mentioned. These are considered important CSFs for LSS project success and not frequently perceived by the respondents. JIT and defects control are not mentioned at all.

Framing of the Lean Six Sigma Change Initiative

Context Management perceives contextual factors leading to LSS change initiatives as mainly low customer satisfaction due to bad reputation, the need to reduce the company's cost base through efficiency optimization, and the need to improve the competitive position of the company. Interestingly, when a top management priority was perceived as a primary contextual driver, there was not one underlying reason. Rather, the reasons varied between cost reduction, competitive pressure, and reputation enhancement, which indicates that there is not one clear strategic reason to commence LSS change initiatives. When middle management or employees did not understand that a top management priority was to start LSS, they perceived customer satisfaction, enhancing the company's reputation, and cost optimization as equally important. Employees perceive contextual factors to commence LSS change initiatives as the need for cost reduction by means of optimization or a bad reputation among customers. Here one can see that perception of contextual factors is similar between management

and employees. Management does incidentally perceive more contextual factors than employees or different contextual factors.

Content The perceived content, or objectives, of the LSS change initiative are divided between two management groups. One group perceives LSS change objectives to be primarily related to customer service and quality improvements, in which cost reduction is a means to an end. By improving processes, improving quality, and reducing errors in the service delivery process, higher customer satisfaction will follow. Higher employee efficiency is one way to achieve this; as a result, lower costs will be a significant benefit. The other group of management perceives LSS change objectives as primarily focused on cost reduction. Statements such as "people never asked for how many improvements, but asked about the FTE reduction" are exemplary for this group. Cost base reduction by improving reliability and flexibility of processes is of primary focus.

Employees perceive LSS change objectives to be cost driven, in which cost reduction is the ultimate objective. Employees have seen FTE numbers decrease ever since the LSS change initiative was deployed or feel that the focus on employee efficiency has intensified. By improving service and quality delivery and employee efficiency, more work can be handled, if necessary, with fewer people. Employees do perceive LSS objectives to be about employee well-being as a means to improve efficiency and reduce the cost base. Employees incidentally perceive employee well-being as an LSS change objective by means of process improvement. Management incidentally believes that employee well-being is an important objective, as a means to better performance, of LSS change.

Management for all companies claims the LSS change initiatives were successful. The projected cost/income advantages were accomplished, customer satisfaction increased, better lead times were reported, less rework was accomplished, and direct report managers actively use LSS to continuously improve the service delivery with their teams.

Managers doubt the perseverance of the LSS way of working and the continued use of LSS. Managers perceive that employees view the LSS change as a one-off result and not a way of performing daily work.

One employee group is clearly happy with the results of the LSS change initiative. Colleagues are happier, and there are clear examples of reduced waste and better customer service. Also, they like the opportunity to learn, participate, and make mistakes. Despite this perception of success, there is a fear that not everybody is willing to keep on using LSS attributes in their work and that things might revert to their previous state. Another group of employees is not so clear about the results and perceives the LSS change as unsuccessful. To them, the one-off results of LSS are not clear. Their way of working changed and became more focused on continuous improvement, but the decrease in management attention on LSS affected the adoption of LSS change attributes throughout the organization. As noted by other researchers, this gap between management and employee perception of results may exist because management uses the rhetoric of success to further drive and develop their change initiative (Zbaracki 1998).

Research question 3: How does the framing of the LSS change initiative differ per case? What stands out in the framing of LSS change initiatives so far is that contextual reasons for LSS change are perceived as similar among managers and employees. This indicates that there is alignment of management and employee understanding about why LSS change has commenced. This is supported by the observation that management does perceive top management decision making as a contextual factor contrary to what employees perceive. Top management reasons to begin LSS change vary for three cases, but in these three cases employee perception is aligned with management perception of top management reasons to commence LSS change. This finding is supported by the existing literature on LSS deployment, whereby a first and important element is a strong organization-wide recognition of the need for change (Kumar et al. 2007).

Content perception differs between management and employees. Employees perceive the cost reduction objective the most. Management perceives customer and customer-related objectives, such as service and quality improvements, which will lead to a better cost

base. This indicates that employee perceptions about LSS change objectives are not fully aligned with management. Contrary to management, employees perceive employee well-being objectives as a means to meet cost reduction, while management generally does not perceive employee well-being as a means to meet any LSS change objectives. Employee narratives about well-being mainly highlight the positive influence of LSS change involvement. This indicates that the perceived importance of employee responsibility in meeting LSS change objectives is not always addressed by management (as management does not perceive employee well-being).

In two cases, employees indicate that the one-off results of the LSS change are not clear. In all other cases, management and employees undoubtedly perceive the one-off results as successful. The main reasons for doubt about the success by management and employees lie in the perceived acceptance and adoption of the LSS change attributes in the way of working. This indicates the importance of employee involvement and ownership of LSS change initiatives. Again, employee narratives about well-being mainly highlighted the positive influence of LSS change involvement. However, only being involved does not ensure ongoing LSS change attributes deployment by employees.

INTERPRETATIONS AND CONCLUSIONS

Three factors that stand out in this study are considered.

Employee and Manager Attitudes: Balancing Cost-Saving and Improvement Focus

In a negative organizational context with unfavorable market conditions (the "bad" context), LSS perceptions are related to fear and resistance. In a positive organizational context with more favorable market conditions (the "good" context), the improvement aspect of LSS will naturally receive the most attention. Then, both employees and managers seem willing to engage in the change initiative. As was mentioned in C4 (that is, the hospital), in a context where competition is increasing, the quest for efficiency will result in more work that is handled by fewer people. The "bad" context effect certainly seems the case in C2. However, market conditions were also unfavorable for C1, C3, and C5, without triggering a negative response to implementation of LSS. Even though employees in C5 were faced with a major reorganization, including a significant cost-saving operation, employees did not blame LSS implementation as a cause for the loss of jobs. This suggests that market conditions alone are insufficient to predict attitudes toward LSS. Managers overall seem less averse to the cost-saving focus, which consequently weighs less heavily on their overall attitude toward LSS. It is theorized that managers are less afraid of cost-saving initiatives. Managers have a more active attitude, and when faced with adversarial change they simply decide to leave the organization (it was stated in C2 that several managers chose to leave the organization when the change initiative was started). In most cases (C1, C3, C4, and C5) perceptions of too little management involvement are reported. The result is a lack of LSS leadership and knowledge, as observed by employees and Black Belts. As management expectations are not clear, employee interpretations about the rationale of LSS are not managed and can unintentionally induce a cost-saving perception of the LSS change initiative.

Theoretical propositions From a theoretical perspective, the relation among market conditions, cost-saving versus improvement strategy, and employee attitudes toward change forms an interesting triangle that allows modeling (and testing) in multiple ways. It can be hypothesized that a relation between market conditions and attitudes to LSS exists, which is modified by the perceived balance of cost saving versus improvement. This mediating effect is expected to be stronger for employees than for managers.

Recommendations for practitioners The authors believe that companies implementing LSS can face a cost bias problem. This means that of all aspects of LSS, cost saving is the most likely to receive wide,

long-lasting, and negative attention. In general, best practices in this regard seem to entail at least: 1) being clear upfront about the aims of the change initiative; and 2) decoupling cost saving expectations from LSS implementation in communication and in practice, at least below the management level. This research shows convincingly that management needs to consciously and continuously deal with the cost bias problem.

Perceived Lean Six Sigma Attributes: Narrow Employee and Manager Perception

For each interviewee a few aspects stand out, while most others are not mentioned at all. JIT production methods, as well as supply chain management, are not mentioned at all. Standardization, for example, looks to be an important feature of all LSS programs, but—except for C1—remains implicit. Much the same goes for the element of defects control. Solving problems and looking for root causes is perceived as the most well-known, important, and enjoyable way to be involved as employees and management (C1, C3, and C5). Four LSS attributes are perceived repeatedly (TQM, HRM, improvement strategies, metrics), whereas others such as JIT or defect control are not mentioned at all (C1-C5). One explanation is that service industries do not produce services in advance and are therefore less subject to the concept of pull. Hence, there is a tendency for managers and employees to base their attitude toward LSS on just a few attributes of the LSS change program.

Theoretical proposition In this study, the framing of the LSS change initiative is quite narrow compared to the broad scope of these LSS attributes that are applied in the change initiatives. In conjunction with the aforementioned cost bias problem, a particularly narrow framing seems to further encourage strong responses. One can hypothesize that the more narrowly LSS is portrayed, the stronger the response will be. This can be an avenue for further research.

Recommendations for practitioners The discussion suggests that conscious effort seems required to keep emphasizing a broad range of LSS aspects, both communicatively and in practice. As the content frames of LSS are generally quite narrow, attempts to broaden the perception of the change initiative to include more than, say, improvement strategies and standardization may have a positive effect on the perception of the change initiative as a whole.

Employee and Manager Framing: Differences in Lean Six Sigma Approaches

C1 and C5 are framed as the most involved in the change initiative, actively engaging employees in the entire change program, with both employees and management framing the change initiative as bringing lasting change, and creating bottom-up demand for further implementation.

C2 is characterized by a strong top-down implementation. C4 is characterized by a similar approach, with LSS explicitly framed as a tool that could be used to achieve certain goals in specific situations and was targeted to a large extent at the managerial level. At C2 and C4 specifically, managers were wondering how to implement the next step, noting that despite significant investments the change initiative would not carry on without continued management pressure and support. Managers were wondering when the LSS change initiative would realize bottom-up participation and noticeable cultural change.

The change initiative in C3 could best be described as unobtrusive, with no significant pressure on either employees or management to implement the LSS change program. There was no sense of a bottom-up initiative carrying the program further, with implementation being portrayed as instrumental in nature. The purported idea behind it was that the organization could have achieved more over the past years when the initiative was carried bottom up.

No firm viewed the implementation of LSS as a way to distinguish it from others or obtain sustainable competitive advantage. If anything, LSS was seen as a basic requirement or table stake for competition.

The authors note that this is unlike most successful firms in manufacturing.

Recommendations for practitioners Based on the authors' findings, there will always be a distinction between quick wins (gained from discrete application) and long-term goals (targeted by a more ostensive approach). A tension between long-term incremental improvement supported by lean theory and a more radically directed approach purported by Six Sigma seems at play. This research suggests that while the Six Sigma approach can have a larger and more immediate effect, the drive required to keep the initiative going after initial management-initiated projects are exhausted comes from a much more gradual and bottom-up implementation of LSS at the shop-floor level.

LIMITATIONS AND FURTHER RESEARCH

The authors acknowledge their methodological approach has some drawbacks.

Limitations

The first thing to note is that interview selection may have been biased up front toward employees and managers who were actively involved in the change initiative. It would take courage for people who actively resist the program to come forward. In addition, the propensity for the interviewees (especially employees) to describe the views of colleagues toward the change initiative as more negative exists. Of all the people invited, those with the most positive attitude toward LSS are more likely to accept the invitation.

Second, there is the risk of falling for the narrative fallacy. The narrative fallacy entails the fact that humans tend to make sense of events after they have occurred, constructing and simplifying meaning, breaking down complex stories to manageable accounts (Kahneman 2011). This plays a role, for example, in the question of which aspects of LSS received the most attention.

Third, one of the drawbacks of open-ended interviews and qualitative case studies in general is the low generalizability of research findings. The small sample size and uniqueness of each data point forced the authors to carefully limit the scope and ambition of their research conclusions.

Another inherent drawback of the research setup is the fact that the evidence gathered is mostly anecdotal in nature. The danger lies in taking one account of a certain phenomenon and turning it into a generalized statement. Aware of this problem, the authors have attempted to reconstruct the accounts for each case using all the available data.

Further Research

An interesting question that seems promising for further research involves the particular change characteristics associated with each LSS program. LSS requires change to be both incremental and radical (Womack and Jones 2003), technical and cultural, organizational and behavioral (Bhasin and Burcher 2006), top down and bottom up, and systemic and local (Bicheno and Holweg 2009). These requirements seem to be contradictory. The concept of dualities places central emphasis on this idea (Seo, Putnam, and Bartunek 2004). The authors go on to list eight different dualities, together forming the 16 change characteristics. The authors suggest first order vs. second order, continuous vs. episodic, and open vs. closed dualities may be the most interesting dualities to research. As they have seen, some firms struggle to create second-order change, which ultimately leads to a "next-step problem;" it would seem worthwhile to further specify a construct to capture this difference between a first- and second-order change focus. The difference between the lean and Six Sigma approach may be most pronounced in their treatment of change as either continuous or episodic. In conjunction with the two aforementioned dualities, an open vs. closed approach indicating bottom-up participation or top-down implementation seems to be an important design choice for the change program.

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APPENDIX: PERCEPTIONS OF LEAN SIX SIGMA: EXTENSIVE WITHIN-CASE ANALYSIS

COMPANY 1

(five interviews, two business managers, one Black Belt, two employees)

Company 1 (C1) is a medium-sized Dutch retail and wholesale bank. An LSS program was carried out successfully in the operations unit, after which the entire company engaged in a full-scale LSS change program. For this case study in the operations department, the change initiative started in 2010.

Attitude Toward the LSS Change Initiative

Management and the Black Belt show acceptance and an active attitude toward LSS change. Employees who accept the LSS change though are more passive than active.

Management attitudes Management is accepting and active in their support of the LSS change initiative. Both managers mention being proud of the success of the initiative, and one describes himself as a "lean believer." Nevertheless, they both have their doubts. One criticizes the moment of LSS change deployment, which was just before a grand cost saving reorganization. The other blames the focus on data collection and management as a premier reason for loss of his management control. The Black Belt is positive as well and calls the LSS change a great success. Despite the success, the Black Belt describes the overall involvement of management as minimal and mainly encouraging.

Employee attitudes Both employees are positive toward the LSS change, more accepting than active. Reasons for positivism about LSS change include: 1) the opportunity to improve one's work; and 2) "because it works." However, on the downside, the LSS change has also increased work stress for the employees due to improved performance transparency.

Discourse attitudes Employees mention that colleagues have been afraid of losing their jobs due to enhanced efficiency. Reports of faulty measurements by employees are stated, after which too many employees were sent home (and others were rehired later). Also, employees mention that their management is probably prohibited to be negative about the LSS change. Management perceives a difference in acceptance among managers, with statements such as, "I think I am the most positive." Management believes that employees perceive the LSS change as a cost-saving operation, though some have truly accepted the LSS change.

Framing of the LSS Change Initiative

Context: perceived reasons behind the LSS change Employees perceive the main reason behind the LSS change to be cost reduction by means of optimizing processes. Management indicates that the main reason is low customer satisfaction, a bad reputation of the company from a service perspective, and projected synergy of the recently implemented merger.

Content: perceived goals of the LSS change The main focus of the LSS change is perceived by employees to be cost driven. They say they have seen the reduction in personnel while working on the LSS change. Management, however, perceives the goals more as customer- and cost-reduction oriented, that is, working toward better customer satisfaction by reducing errors and optimizing processes. Then cost reduction will logically follow. One manager indicates that this should have been communicated more clearly (see Figure 1A).

Management states that cost base and employee well-being are of primary focus. Employees state that improving service and quality delivery, and employee efficiency are of primary focus. Management perceives cost reduction as a means to an objective (side effect), while employees perceive cost reduction as an objective. Employees feel that the LSS change was a success.

Figure 1A Perceived goals rated on a 1 to 5 scale by the respondents

	Management			Average	Employee		Average
Improving service and quality	3.5	5	3	3.8	4	4	4
Reducing the cost base	5	4	4	4.3	3	5	4
Improving employee well-being	3	4	4	3.7	3	3	3
Improving employee efficiency	2	4	2	2.7	4	5	4.5
Increase the reliability of the processes	–	–	–	–	–	–	
Increasing the flexibility of the processes	–	–	–	–	–	–	
Increasing the speed of delivery	–	–	–	–	–	–	

Figure 2A Lean Six Sigma attributes cited by respondents

		Management		Black Belt	Employees		Total
Lean	Just in time practices						0
	Resource reduction	1	2	4	1		8
	Improvement strategies	4	1	2	3	1	11
	Defects control						0
	Standardization	1	2	1	1	1	6
	Scientific management	1	2	1		2	6
	Human relations management	4	2	3	3	3	15
	Supply chain management	4			1		5
Six Sigma	Total quality management	8	6	2		1	17
	Customer focus	2		1	1		4
	Additional metrics	7	3	1	2	1	14
	Financial results						0
	Structured improvement method	1	2		1	1	5
	Project management structure	3	4	1		2	10

Colleagues are happier; they give examples of reduced waste and better customer service. Also, the opportunity to learn and make mistakes is mentioned. Management also mentions the LSS change as being a success because the projected synergy has been accomplished and direct report managers are actively using LSS tools to continuously improve the work with their teams.

Perceived Lean Six Sigma Attributes

Four attributes are mentioned most often: TQM, human relations management, additional metrics, and improvement strategies. Here, JIT, defects control, and financial results are not mentioned at all (see Figure 2A).

TQM is frequently mentioned with regard to management involvement in the LSS change implementation process. Telling the story and leading the change is a key role for senior management, as described by management. Setting direction and pace and making an example of continuous improvement are mentioned by management as some of their activities. Also, the importance of a continuous improvement culture is mentioned as a necessity. The Black Belt mentioned the focus of the LSS change on the workshop floor and less on management and stressed the importance of the culture of

continuous improvement. One employee stated that his manager was heavily involved in executing the LSS change tooling, which was considered helpful.

Human relations management is discussed by management and the Black Belt as the bottom-up approach of the LSS change, starting with small-scale projects and increasing the effort, while in the meantime training the employees in LSS tooling. Also, the involvement of employees in executing analysis on the work floor by the Black Belts is described by management. Employees describe the bottom-up character of the LSS change and the opportunity to be involved and share ideas.

Additional metrics are described by management, the Black Belt, and employees as the daily huddle that started after the LSS change program began. They all mention the discussion about the data in the daily huddle, the so-called performance dialogues. One employee and one manager describe how they can learn from each other, but even more so how data put a burden on them, as they must explain better or worse performance.

Improvement strategy is described as the way in which improvement ideas are generated by employees, and management perceives this as something that needs constant attention. Employees describe improvement as something that is done in small steps—learning by doing—but it is hard to maintain, as new ideas for improvement are less easily generated.

The main difference between management's and employees' perception is how management describes how management involvement and a culture of continuous improvement are of key importance. On the other hand, employees hardly mention the subject, let alone how they have experienced the role of management in the LSS change.

COMPANY 2

(four interviews, two business managers, one team manager, one employee)

Company 2 (C2) is a large Dutch pension funds administrator. The organization is part of a much larger corporation with activities across Europe. An LSS program was carried out successfully in another corporate business unit prior to implementation within this unit. For this case study, the change initiative started in 2008.

Attitude Toward the LSS Change Initiative

Unit level management was generally accepting of the LSS change, but at the team level there was notable resistance.

Management attitudes The higher-level managers who were interviewed accept the ideas of LSS, although one said that it alone was not enough to bring about all the necessary changes. Their view on LSS is complemented by an active stance toward achieving the aims set out for the organization. They are critical, however, of the way in which the change initiative was implemented, its achievements during the first years, and the level of the in-house LSS experts.

Employee attitudes Employees are even more critical of the LSS program, quite clearly rejecting the way it was implemented. The daily activities are described as a waste of time. The employee indicates that if management would stop implementation of LSS today, everyone would be relieved, nobody would care, and as far as he can tell, nothing would be missed.

Discourse attitudes Top management is described as being very enthusiastic about the LSS change program. Employees are perceived as less enthusiastic, as they wouldn't fit the "standard approach" that LSS prescribes. For them, it feels like a "must do" and is not perceived as a means to an end. Also, the LSS change is perceived as a nice way (customer focus, continuous improvement) to bluntly cut costs. Looking back, most of the tooling is thought to be badly perceived. Only the daily huddles are mentioned as valuable for colleagues.

Framing of the LSS Change Initiative

Context: perceived reasons behind the LSS change The main reasons behind the LSS

Figure 3A Perceived goals rated on a 1 to 5 scale by the respondents

	High management		Average	Team level		Average
Improving service and quality	2	–	2	4	4	4
Reducing the cost base	5	4	4.5	5	4	4.5
Improving employee well-being	1	2	1.5	3	3	3
Improving employee efficiency	4	4	4	5	4	4.5
Increase the reliability of the processes	4	3	3.5	3	3	3
Increasing the flexibility of the processes	3	2	2.5	2	1	1.5
Increasing the speed of delivery	4	2	3	4	4	4

change are perceived as quality improvement (process improvements) and customer satisfaction improvement, and as a side effect, efficiency optimization (cost reduction). Both the employee and management indicate that LSS change was mainly initiated to improve the company's reputation toward the customer.

Content: perceived goals of the LSS change When asked for objectives of the initiative, the main focus of the LSS change is perceived to be cost driven. "People never ask for how many improvements, but do ask about the FTE reduction" one manager stated. Also, the employee mentions the bottom-line result of cost reduction of improved efficiency (see Figure 3A).

Management states that cost base, reliability, and flexibility of processes are of primary focus. The team level states that improving service and quality delivery, employee well-being and efficiency, and speed of delivery are of primary focus, which results in reducing the cost base. Management perceives cost as an objective, and the team level as a means to an objective.

Upper management is very clear about the results; they see LSS as successful because of the improved returns and higher customer satisfaction, as a one-off result; the way of working (continuous improvement) has not significantly changed, and that jeopardizes the chances of continuing success. The team level is less clear about the results; they indicate that the returns are not clearly visible, but this group did experience a change in the way of working (continuous improvement).

Perceived Lean Six Sigma Attributes

Three attributes are mentioned most often: additional metrics, project management structure, and human relations management. Here, JIT, resource reduction, and defects control are not mentioned at all (see Figure 4A).

Additional metrics are for upper management an important aspect of lean; taking measures and collecting data are stressed. Looking at individual and team performance is described as a blessing for management, but it is thought of as extra work to be done for management by the employees at the team level.

Project management structure is mentioned by upper management as the way LSS change is implemented, with LSS experts who are assigned to implement continuous improvement in a structured manner (waves) and educate employees and management. The team level mentions project management structure as LSS experts who are supposed to deliver continuing support for the continuous improvement initiatives at the departments but did not do that.

Human relations management in the accounts of both managers and employees comprised the in-house training program. Almost without fail, this training program and the level of the in-house LSS experts are mentioned in a negative fashion. Still, the continuing efforts to train employees at various levels, and ingrain certain daily habits and activities, are considered an important aspect of the LSS program.

Figure 4A Lean Six Sigma attributes cited by respondents

		High management		Team level		Total
Lean	Just in time practices					0
	Resource reduction					0
	Improvement strategies	1		1		2
	Defects control					0
	Standardization	2			2	4
	Scientific management	1			2	3
	Human relations management	2	3	1	2	8
	Supply chain management	1				1
Six Sigma	Total quality management	1	2		2	5
	Customer focus		1		2	3
	Additional metrics	3	4	2	2	11
	Financial results	1	1		2	4
	Structured improvement method	1	1	1		3
	Project management structure	2	3	1	3	9

The main difference between management's and employees' perception is in the comprehension level of the LSS attributes. For the aforementioned attributes (additional metrics, project management structure, and human relations management) upper management mainly describes *what it is* and the team level mainly describes *how it works or does not work*. For example, additional metrics are described by upper management as insights into team performance to compare and improve, whereas the team level describes the difficulties in getting the management information available and the uncertainty about its use. The same applies for human relations management; upper management describes the in-house training availability, whereas the team level talks about the lack of LSS expert availability in continuous support.

COMPANY 3

(six interviews, one board member, one business manager, two Black Belts, two employees)

Company 3 (C3) is a Dutch subsidiary of a European life insurance company and is a relatively small player on the Dutch market. The organization employs about 450 people. Implementation of an LSS change began in 2009.

Attitude Toward the LSS Change Initiative

Acceptance with a more passive than active modus is found at the managerial level. Employees are accepting though passive in their efforts to do more with LSS change.

Management attitudes Both top-level and team-level management seem accepting in their support of LSS change, with one saying that implementation would be enforced even in the face of open resistance. At the operational level, a lack of clear vision caused a chaotic implementation. Management generally enjoys the challenging work of implementing the change program, stating that it is good to look at the basic problems of the company and try to fix them. The Black Belts generally share the same enthusiasm.

Employee attitudes Both employees state a desire to "do more with lean," feeling that management support for the initiative is lacking and stating that the LSS way of working appears to be fading away. While one of the employees did not feel empowered to change this personally, rather waiting for management to make a move, the other tried to use the acquired skills to actively initiate change. Both employees agree

that it would be good to implement LSS further and more formally in the organization.

Discourse attitudes Both Black Belts report the missing of a true sense of urgency by management and employees due to the lucrative past years of insurance companies. However, when a specific solution for a specific problem, such as capacity management, is offered as an LSS tool, management becomes interested—not in the tool but in what it can do for the company. One employee indicates that the direct colleagues are not that interested in LSS.

Framing of the LSS Change Initiative

Context: perceived reasons behind the LSS change Reputational or competitive reasons are not perceived. Mainly, the trend in the financial industry and the resulting cost-optimizing benefits are perceived as the main argument for the headquarters decision to start the LSS change. One Black Belt perceives the direct operational problems as the main reason why the headquarters initiated the LSS program. Management agrees that a true sense of urgency is still lacking. Employees perceive the reasons to start simply as an assignment from local management and shareholders demands. Also, employees state that competitive or reputational reasons are not at hand.

Content: perceived goals of the LSS change The goals of LSS change are mainly perceived to be focused on optimizing the processes, in a way that processes deliver more quality, and are more efficient, reliable, and flexible at a higher speed of delivery. Management perceives the content of the LSS change to be focused more on service and quality improvement by means of efficiency gains (and resulting cost benefits). Employees perceive the content of the LSS change to be focused more on service and quality improvement by means of process improvements (and resulting improved employee well-being) (see Figure 5A).

It is interesting to see the difference between management and employees: Management perceives cost reduction, employee efficiency, and process flexibility as more important goals and employees see improving employee well-being and process reliability as more important goals.

The implementation of LSS is regarded differently by every group. Management perceives LSS change as largely successful, ranging from a team manager who has less inventory, better lead times, and no rework, and thus perceives success—to upper management who mentions that LSS tooling is not used everywhere in the organization to its greatest potential—though sees the LSS change as successful. The Black Belts perceive the LSS change as a success, though they feel the pace of change could be faster, especially if management shows more exemplary behavior. Employees perceive the LSS change not as successful; that is, for their department they do, but not when they look at the whole organization. They feel management attention toward LSS change is falling and only a group of LSS enthusiasts (employee level) keep the way of working alive.

Figure 5A Perceived goals rated on a 1 to 5 scale by the respondents

	Management			Average		Employees		Average
Improving service and quality	5	3	5	4	4.3	4	4	4.0
Reducing the cost base	4	4	3	5	4.0	2	3	2.5
Improving employee well-being	5	3	4	3	3.8	4	4	4.0
Improving employee efficiency	5	4	4	4	4.3	2	3	2.5
Increase the reliability of the processes	3	3	4	4	3.5	4	4	4.0
Increasing the flexibility of the processes	5	4	4	4	4.3	2	2	2.0
Increasing the speed of delivery	5	4	4	3	4.0	4	4	4.0

Figure 6A Lean Six Sigma attributes cited by respondents

		Management		Black Belt		Employees		Total
Lean	Just in time practices							0
	Resource reduction	1		1	1	2	1	6
	Improvement strategies	2		4	1	4	1	12
	Defects control							0
	Standardization	1		1				2
	Scientific management	1		1		5		7
	Human relations management	3		3	1	2	1	10
	Supply chain management					2	2	4
Six Sigma	Total quality management	4	2	5	7	5	3	26
	Customer focus	3		3		5	2	13
	Additional metrics	2	1	5	1	1		10
	Financial results					1		1
	Structured improvement method	1		1			1	3
	Project management structure	1		2		1	1	5

Perceived Lean Six Sigma Attributes

Three aspects of lean and Six Sigma are mentioned in particular by the respondents: improvement strategies, TQM principles, and customer focus. JIT and defects control are not mentioned at all (see Figure 6A).

Improvement strategies are perceived by management as searching for root causes for problems, together with all the employees and as a continuous process. Black Belts mainly perceive improvement strategies as searching for root causes. Employees perceive the improvement strategy as defining the standard and look for ways to improve this standard with a pragmatic approach without any structure.

Management perceives the organization as too undetermined to make the LSS change into a lasting success (cultural change). The Black Belts perceive a culture of continuous improvement among the employees, though not enough management involvement in terms of leadership and LSS knowledge. Employees perceive management involvement as too little and are not really sure whether they are expected to continue the LSS change. They do perceive management pressure on improving processes, though how they do this is up to them.

Customer focus is mainly described as the LSS tools used to investigate the voice of the customer by management. The Black Belts indicate that the voice of the customer is of little interest to the company. Employees mainly perceive customer focus as a driving force of change actively communicated by management, though actually knowing what customers want is perceived to be unclear.

Management and the Black Belt mainly perceive the attributes as what they should do and employees perceive at the operational level whether the attributes work. From a customer focus, management perceives the voice of the customer; employees perceive a lack of understanding of the voice of the customer. From a scientific management perspective, management describes how they apply measurement and balanced scorecards, employees perceive the measurements as rough estimates due to the lack of data. The same example applies for supply chain management.

COMPANY 4

(five interviews, one unit manager, two team managers, two employees)

Company 4 (C4) is a Dutch general hospital. It is one of the larger general hospitals in the Netherlands, employing almost 3,000 people (including about 200 medical specialists) at several hospital locations and laboratories. Implementation of LSS started in 2009.

Attitude Toward the LSS Change Initiative

The interviewees generally accept the ideas of LSS and valued the change initiative. On the part of employees, however, there is considerable passivity regarding the change initiative. There is a general feeling that implementation of the program lies with management or other employees.

Management attitudes While managers agree with the basic premises behind LSS—describing it as a useful tool to achieve certain goals—all managers interviewed stressed that it was only one of many management instruments. One manager said that LSS was in fact not the top priority for investment, and that the initiative had been allowed to burn low for a while.

At lower-level management, positive attitudes regarding the content of LSS and the potential for improvement that it carried are coupled with a general feeling of lack of time and lack of effort on the part of colleagues. In addition, the financial focus of LSS is considered annoying.

Employee attitudes Employees claim that it is nice to have the feeling that improvements came from the organization's own personnel, as opposed to being forced upon them by quality label demands or government regulations. LSS was also cited as an opportunity for employees to show and develop skills they would normally be unable to, and to grow in this regard. Both employees interviewed, however, also said they did not know LSS in-depth, and were only aware of what the program was supposed to achieve in the most general terms. It was simply not considered an important aspect of daily routine.

Discourse attitudes Management states that the medical staff in particular was not very happy with the LSS change initiative in the beginning. The increased visibility was not welcomed, although the financial benefits of LSS change initiatives were welcomed by those who benefitted from the results. Employees mentioned the lack of LSS understanding among their colleagues, which made it hard for them to change.

Framing of the LSS Change Initiative

Context: perceived reasons behind the LSS change The main reason behind the LSS change—as perceived by middle management respondents—is that it is a top management decision. Employees perceive reputational over competitive reasons as the main driver of the LSS change initiative; the hospital wants to be known as the highest-quality hospital. Management believes that the increasing competitive pressure in the deregulating Dutch hospital-care market is a clear reason behind implementing the LSS change initiative.

Content: perceived goals of the LSS change The goals of LSS change are mainly perceived to be increasing employee efficiency, increasing speed of delivery, and reducing the cost base. Reducing handling time, total handling time per patient, and corresponding cost reductions are important factors in the narratives of management and employees. Management perceives that the way to achieve this is by focusing on improved service, quality, and employee efficiency. Employees mainly perceive the focus on cost reduction and employee efficiency (see Figure 7A).

Management states improving service and quality as the most important goals, and employees see reducing the cost base, improving employee well-being, and increased reliability and flexibility of processes as the most important goals. Management expects more from the employees (employee efficiency), and employees expect more from the processes (and employee efficiency).

The implementation of LSS is viewed both by managers and employees as largely successful. Management perceives operational benefits such as cycle-time reduction, improved profitability, and

Figure 7A Perceived goals rated on a 1-5 scale by the respondents

	Management			Average	Employees		Average
Improving service and quality	5	3	5	4.3	3	4	3.5
Reducing the cost base	4	4	3	3.7	4	5	4.5
Improving employee well-being	3	2	2	2.3	5	2	3.5
Improving employee efficiency	5	4	5	4.7	5	4	4.5
Increase the reliability of the processes	4	3	1	2.7	–	4	4
Increasing the flexibility of the processes	4	4	1	3.0	4	4	4
Increasing the speed of delivery	5	4	3	4.0	4	5	4.5

Figure 8A Lean Six Sigma attributes cited by respondents

		Management			Employees		Total
Lean	Just in time practices						0
	Resource reduction	2		1		1	4
	Improvement strategies	1	1	5	1	1	9
	Defects control		1	2			3
	Standardization	1	1	2		1	5
	Scientific management	4	1	4		2	11
	Human relations management	4		4	2	3	13
	Supply chain management	1	2	2		1	6
Six Sigma	Total quality management	4	7	6	2	3	22
	Customer focus	4		1		3	8
	Additional metrics	2		1			3
	Financial results		1	2			3
	Structured improvement method	2	2	1			5
	Project management structure	3	2				5

reduced resources. On the other hand, management feels skeptical about the true acceptance of LSS attributes. They state that if the CEO would leave, the LSS change would stop. Employees cite successful projects as examples of the success of LSS change, though they often see colleagues who do not use LSS attributes.

Perceived Lean Six Sigma Attributes

Three aspects of lean and Six Sigma are mentioned in particular by the respondents: TQM (here mainly management involvement), human relations management, and scientific management. JIT is not mentioned at all (see Figure 8A).

TQM references are mainly about the determined attitude of top management and the lack of determination by the middle management (themselves). The main reason mentioned is the difficulty in getting managers to adopt each other's best practices. Besides, middle management perceives LSS as one of their tools, among others. Employees perceive that there is a need for wider commitment toward LSS change and that management should enforce this more. Today, there

is too much of a not-invented-here mentality, and this hinders the success of LSS change.

Human relations management is about the training (Green Belt) that management receives in order to execute LSS change projects. Employees perceive the LSS change as projects that are being executed by management; they would like a new program in which employee participation is more integrated.

Scientific management is described by management and employees as the measurement of process data. Management describes how measurements really help convince stakeholders to change processes and employees experience that data are perceived as more important than what they think.

The main difference between management and employee perception is in: 1) standardization, where employees perceive this as a checklist and management perceives this as the frustration that best practices are not shared between departments; 2) the use of measurements is perceived as convincing by and for management, though employees feel that the data are more important than their opinion; 3) management has many Six Sigma references where employees only mention TQM and customer focus. This is due to the fact that management is trained to execute LSS project and employees feel less involved.

COMPANY 5

(five interviews, one manager, one Black Belt, three employees)

Company 5 is a medium-sized pension and life insurance company that employs about 700 people and is the daughter firm of a larger corporation. The organization began implementing LSS in 2007.

Attitude Toward the LSS Change Initiative

Active acceptance is the dominant attitude for four out of five interviewees.

Management attitudes Despite their active stance, LSS is viewed as an obligation rather than an asset. Mostly, however, the importance of customer centricity is emphasized, with lean viewed as a constructive way to achieve this goal. Being able to delegate challenging and constructive tasks (for improvement cycles) is viewed as an important—and even fun—aspect of lean management.

Employee attitudes Employees focus on the "inspiring" aspect of improving processes together with colleagues, which most would actively promote. This active stance is coupled with the reported pleasure of improving customer experience and reducing errors, and generally of participating in improvement projects with colleagues.

Discourse attitudes Attitudes reported in others are marked less positive, stressing the lack of influence on chosen measures and the increase in workload as a result of LSS. Also, the focus on man-hour reduction is mentioned as an underlying reason for the participation of colleagues in the LSS change. The result is a fear that engaging in improvement ultimately results in a reduction in jobs.

Framing of the LSS Change Initiative

Context: perceived reasons behind the LSS change Middle management respondents and employees perceive the main reason behind the LSS change to be a top management decision. Four out of five perceive that management decided to start the program to enhance the company's reputation to customers. Every respondent perceives competitive advantage to be the least important reason to go ahead with the LSS change program.

Content: perceived goals of the LSS change The goals of LSS change are mainly perceived to be cost driven. Employees and management indicate that the LSS change had a focus on reducing a certain number of man-hours per year. Incidentally, management and employees mentioned that the focus of the LSS change was not on only cost saving, but also on improving customer satisfaction. Immediately following this statement it was

Figure 9A Perceived goals rated on a 1 to 5 scale by the respondents

	Management		Average	Employees			Average
Improving service and quality	5	4	4.5	5	4	5	4.7
Reducing the cost base	5	4	4.5	4	2	5	3.7
Improving employee well-being	3	3	3	5	5	3	4.3
Improving employee efficiency	5	4	4.5	5	5	5	5.0
Increase the reliability of the processes	5	3	4	5	4	5	4.7
Increasing the flexibility of the processes	4	5	4.5	3	4	3	3.3
Increasing the speed of delivery	5	5	5	5	4	5	4.7

Figure 10A Lean Six Sigma attributes cited by respondents

		Management	Black Belt	Employees			Total
Lean	Just in time practices						0
	Resource reduction		1		1	1	3
	Improvement strategies	2	3	1	1	5	12
	Defects control						0
	Standardization		1	1	3	3	8
	Scientific management	1	1		1	1	4
	Human relations management	3	2		1		6
	Supply chain management		1		1	1	3
Six Sigma	Total quality management	1	6		2		9
	Customer focus	2	2		2		6
	Additional metrics	1	2				3
	Financial results	2	2		1	1	6
	Structured improvement method	1	4	2	1		8
	Project management structure		2		1		3

mentioned that the motivation of employees to participate is perceived to be driven by personal savings targets (see Figure 9A).

Interestingly, management states that cost reduction and flexibility are more important goals and employees see improving employee well-being, efficiency, and process reliability as the most important goals.

The implementation of LSS is regarded both by managers and employees as largely successful. Even though implementation takes time, initial projects made enough gains that top management remains committed to further implementation. Yellow Belt training has given employees some tools for implementing smaller changes. More importantly, there is a tentative bottom-up demand for lean initiatives. This makes it easier to start new LSS projects.

Perceived Lean Six Sigma Attributes

Four aspects of lean and Six Sigma are mentioned in particular by the respondents: improvement strategies, TQM (here mainly management involvement), structured improvement method, and standardization. JIT and defects control are not mentioned at all (see Figure 10A).

Improvement strategies are about the so-called "kaizen" approach of solving problems and are very similar to the structured improvement method. Respondents indicate the pleasure in getting together voluntarily in a multidisciplined team (improvement strategy). By starting with a joint problem indication, the team worked step by step toward a solution (structured improvement method). The problems were manageable, and because of representation of all departments concerned, decision making was fast and results became quickly visible.

TQM here is only about top management involvement. The manager, the Black Belt, and the employee indicate that management involvement is important, though management doesn't participate in LSS change (although they do "allow" it).

Standardization is mentioned only by employees (and the Black Belt) as a means to unify service delivery to the customer by means of standard operating procedures.

The main difference between management's and employees' perception is in human relations management and additional metrics. Management indicates that they received LSS Green Belt (advanced LSS) training before starting the LSS change. Employees are sent to compulsory Yellow Belt (beginners LSS) training. Additional metrics are only mentioned by the Black Belt in terms of cycle time as performance indicators. Employees do indicate that they start with daily huddles in which they discuss the performance of the day but do not mention the metrics.