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Management support for the application of Lean Six Sigma methodology to improve customer satisfaction in a South African telecommunications company

Abstract

During difficult financial times, companies are always looking for ways to improve their bottom line. Lean Six Sigma (LSS) is a holistic business improvement methodology that maximizes shareholder value by increasing customer satisfaction and reducing the cost of complexity. The purpose of this paper is to explore the importance of management support when implementing LSS in a South African telecommunications company and to establish if management perceives that LSS leads to improved customer satisfaction. The research design involves a structured literature review on the application of LSS in services and a case study conducted at a South African telecommunications company. From the semi-structured interviews with various management levels in the company, it became evident that although managers are aware of the implementation of LSS in the company, there is not overall support from top management, and this impacts negatively on the application of LSS. With regard to how customer focused LSS is, the interviewees all agreed that the methodology is customer focused, but some were concerned that top management might be more concerned about internal, as opposed to external customers.

This research emphasizes the importance of management support when new performance methodologies are introduced in a company. The telecommunications industry plays a significant role in the economy of South Africa and if the introduction of LSS could improve service delivery and ultimately contribute to increased bottom line results, further research could be conducted on the financial implications of its application and implementation.

Keywords: Six Sigma, Lean, Lean Six Sigma, continuous improvement, service industry, performance management, telecommunications.

JEL Classification: L96, M14, M40.

Introduction

Since its introduction in the early 1980s, the Six Sigma (SS) approach as a means of improving, inter alia, financial performance through systematic measurement has been used predominantly by manufacturing organizations (Antony, Antony, Kumar & Cho, 2007). Likewise, lean thinking as “a pursuit of perfection by constantly eliminating waste through problem solving” (Liker & Franz, 2011) has led to comprehensive changes in the manufacturing process. Since then the term “lean” has been used generally in business language, for instance, “lean production”, “lean management” and “lean organizations”. In turn, Davies and Boczka (2005) use the term “lean accounting” to describe the financial performance of a company that has implemented lean processes, with an emphasis on eliminating waste and creating capacity for an improved longer-term financial performance.

Although SS application is limited in service industries (Chakrabarty & Tan, 2007), its popularity in service organizations is currently growing exponentially and aims to ultimately reduce deficiencies and enhance overall customer satisfaction (Antony et al., 2007). In addition, Pieterse (2007) concurs that lean concepts, as

pertaining to manufacturing, can also be successfully applied in service industries. Contrary to the fact that Six Sigma and Lean are often regarded as rival initiatives, the blending of these methodologies addresses both quality (the elimination of defects and reduction of variation) and speed (the elimination of waste and cycle time) in order to achieve business excellence and customer satisfaction (Bicheno & Pieterse, 2008; George, 2003; Psychogios, Atanasovski & Tsironis, 2012).

Although the literature shows that Lean Six Sigma (LSS) techniques hold the potential to improve company performance, the implementation thereof poses many challenges (Jeyaraman & Teo, 2010; Pepper & Spedding, 2010). These challenges include the lack of proper planning and a clear strategy to align the cultural aspects of Lean with the Six Sigma’s data driven approach. One of the key findings, in a survey regarding industry-wide best practices in management accounting, revealed that management commitment (support) is an important trigger for the adoption of best-practice solutions to improve companies’ financial performance (Garg, Ghosh, Hudick & Nowacki, 2003). Ultimately, LSS is regarded as a comprehensive management system with an emphasis on customer satisfaction, high quality and employee empowerment (Arnheiter & Maleyeff, 2005).

In line with the rest of the global business world, South African organizations have also embarked on several

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quality improvement programs such as total quality management (TQM), Kaizen, Hoshin, just in time (JIT) and the South African excellence model (Murray, 2007; Nguenang, 2010). Although many authors (Kwak & Anbari, 2006; Nakhai & Neves, 2009; Oke, 2007) have debated the successful application of SS initiatives in multinational companies, Antony and Desai (2009) posit that few papers have been published on the utilization of it in developing countries. It follows that even fewer papers have been published on the introduction and application of LSS, in South African service industries.

From the literature the researcher identified a need to explore the importance of management support for the adoption of LSS in the service industry, with specific focus on a telecommunications company. Telecommunications services are a crucial component of the global economy and are imperative in terms of technology, regulations, customer demand and competitive actions (Psychogios et al., 2012). LSS has been said to have a significant impact on customer satisfaction, improving the bottom line and working culture of an organization (Kumar, Antony & Tiwari, 2011). Therefore it was decided to explore how different levels of management in a telecommunications company perceive the implementation of LSS.

The objective of this paper is to establish management's post-implementation perceptions of the LSS methodology in a telecommunication company in South Africa. In spite of extensive literature on LSS (Anthony et al., 2007; Jeyaraman & Teo, 2010; Näslund, 2008; Shah, Chandrasekaran & Linderman, 2008; Zhang, Irfan, Khattak, Zhu & Hassan, 2012), there is a dearth of literature on LSS implementation in the telecommunication industry, especially in a developing country. This paper contributes to the literature by providing an insight into managers' perceptions on the support from management for the implementation of LSS in a telecommunication company (Company A), in a developing country, and also if they perceive that the implementation led to improved customer satisfaction. Various stakeholders will benefit from the study especially if they take note of the different management levels' positive and negative perceptions of the implementation of LSS in their company.

1. Research method

The paper commences with a conceptual analysis of the application of LSS methodology in service organizations. It will examine the application, benefits and challenges of LSS in service organizations, as presented in the worldwide literature. The research is explorative. The major

purpose of exploratory research is the development and clarification of ideas and the formulation of questions for more precise subsequent investigation. Typically, this type of research involves gathering a great deal of information from a small sample (Struwig & Stead, 2013).

The adoption of the LSS approach in service industries is not as widespread as in manufacturing industries. By conducting both an in-depth literature review and a case study, this article focuses on gaining a better understanding of the importance of management support of LSS methodologies in service organizations, in order to improve customer satisfaction. A case study approach was deemed appropriate because the research involved an in-depth study of organizational and managerial processes in only one organization (Given, 2008; Yin, 2009). The exploration of the case involves multiple sources of information (De Vos, Strydom, Fouché & Delpont, 2005), for instance, interviews with various management levels, documents relating to the LSS approach and archival records, which will provide rich information pertaining to a South African service organization, specifically in relation to the telecommunication industry.

In order to obtain a rich account of the benefits and challenges of a LSS approach and the management support in this particular service organization, and to enquire if its application contributed to customer satisfaction, a case study was conducted at Company A, a major role-player in the telecommunications industry in South Africa. To ensure anonymity, the pseudonym "Company A" was selected. Case study research was chosen because of its ability to deal with a variety of evidence, including written procedures, documents and interviews (Yin, 2009). Ethical clearance was granted by the University of South Africa's College of Accounting Sciences (CAS) Ethics Committee (Ref#: 2014/CAS/SAS/002) and permission was obtained from Company A to conduct the interviews.

Company A, a major telecommunications company operating in more than 38 countries across the African continent, was selected because they have already implemented LSS as a performance improvement method. In a quest to, inter alia, improve customer satisfaction, through eliminating defects and waste, while also reducing variation and cycle time, they firstly introduced Lean methodology during 2006 and SS during 2007. They initially trained 12 Lean champions ("champions" refer to project managers identified to introduce and implement the methodology). After extensive training, these champions then introduced Lean through a project-based system to more operational

units in the Company. Company A then followed the structured DMAIC-framework of SS and applied it on the already introduced Lean concepts. The DMAIC approach refers to the “define, measure, analyze, improve and control” processes in the quest for continuous improvement.

In-depth interviews, also referred to as semi-structured interviews were conducted, after acquiring prior approval from the participants and ensuring their anonymity. The researcher needed to select interviewees who could provide information on the issue under investigation (Henning, Van Rensburg & Smit, 2004). Based on the advice of one of the LSS champions in Company A, nonprobability purposive sampling was used to interview employees representing different management levels and also those who had in some way been exposed to the LSS approach.

Of the 13 interviewees, two managing executives, two executives, one senior manager, four managers and four operational managers were interviewed. Digital voice recordings of the interviews were transcribed and checked with hand-written notes taken during the interviews. Data were coded manually and since this study involved an explorative approach to theory building, themes were identified and broken down into categories and subcategories (De Vos et al., 2005) for reporting purposes.

To ensure credibility, all the interviews were conducted by the primary researcher who had previous interview experience. Interviews were conducted at Company A's premises and written consent was given by all. Although most of the interviews were conducted face to face, a number were done telephonically. Prolonged engagement was achieved and the same questions were put to all the interviewees. Although only managers were interviewed, specific groups were not excluded on the basis of race, gender or any other social or financial criteria.

2. Literature review

In assessing the readiness for SS in the service sector, Hensley and Dobie (2005) found that it is difficult to collect data in service industries. Many service processes are unseen, sometimes even unmeasurable, and when compared to manufacturing processes, is subject to more noise or uncontrollable factors (Antony, 2004; Chakrabarty & Tan, 2007). Customer service improvement is hampered by organizations' inability to “strike a balance between conflicting stakeholder demands and the integration of the right variables in the right amount” (Nienaber, 2010). According to Athanassopoulos and Iliakopoulos (2003), the literature on customer satisfaction in

telecommunications is scattered and does not provide an overall understanding of the dynamics of customer satisfaction. Furthermore, Psychogios et al. (2012) postulate that there is a limited spread of LSS in service and that its application in telecommunications services has been mostly unexplored.

The analysis of data collected from a telecommunications company in Malaysia showed that if a company intends boosting customer loyalty it should consider an improvement in the channeling of orders, operating hours, a fault reporting center, response time and restoration time (Khatibi, Ismail & Thyagarajan, 2002). LSS methodology can be used to assist with these improvements. In their study on the integration of SS and lean management, Salah, Rahim and Carretero (2010) described LSS as a “methodology that focuses on the elimination of waste and variation, following the DMAIC structure, to achieve customer satisfaction with regards to quality, delivery and cost”.

Although the application of LSS is less tried in the telecommunication sector, LSS uses tools from both Lean and SS to improve speed and efficiency as well as precision and accuracy. In other words, LSS methodology ensures that resources are applied to the right activities and things are done right the first time (Laureani, Antony & Douglas, 2010). However, Dahlgaard & Dahlgaard-Park (2006) warn against the danger of adopting new performance concepts and tools, without establishing the right company culture from the top management level to the shop floor level. Although many organizations have embraced LSS to improve company performance, the integration of Lean and SS are also criticized by some authors (Bendell, 2006; Jeyaraman & Teo, 2010), especially with regard to the differences in training and the unsuccessful execution of the LSS program in some organizations. Mika, in Pepper and Spedding (2010) goes on to suggest that the two approaches are incompatible because Lean is accessible by floor-level workers, while SS is not.

On the other hand, Bicheno and Holweg (2009) state that: “Lean and Six Sigma are no longer at odds, nor should they be.” The literature further shows that although the two methodologies interact and reinforce each other, they are two different concepts (see Figure 1). Whilst SS is predominantly a powerful problem-solving methodology through DMAIC, Lean is better at gaining a holistic view of the organization (Bicheno & Holweg, 2009; George, 2003). According to Ballé and Ballé (2009), “lean is about serving customers better with less staff, less inventory, and less capital expenditure”. Some of the individual characteristics of SS and Lean, as well as those of LSS, are indicated in Figure 1 below.

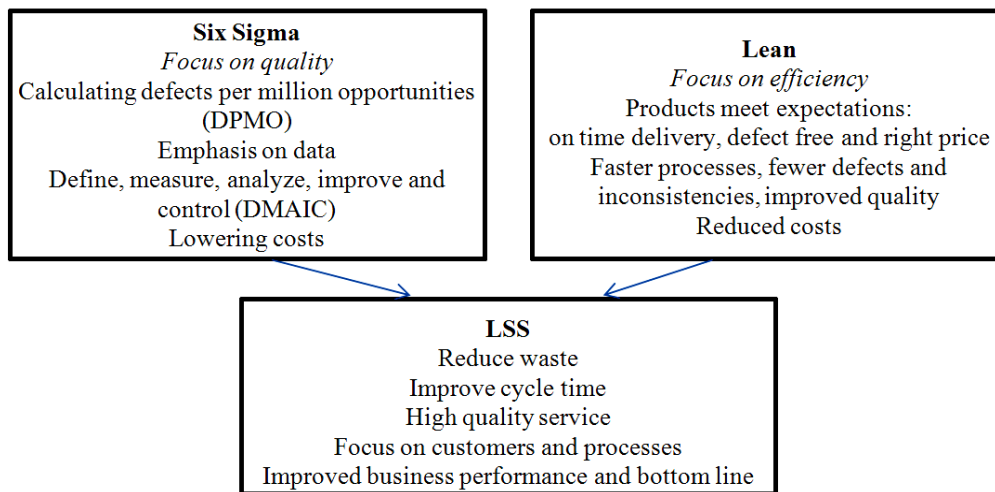


Fig. 1. Characteristics of Lean, SS and LSS

Source: Own observation

Figure 1 illustrated how LSS can provide a holistic approach to improved business performance. Apart from the evident benefits of applying LSS, the literature shows that there are both institutional and contextual factors that challenge the successful application thereof (Psychogios et al., 2012). One of the principal institutional factors is directly related to top management support to ensure that LSS is embraced throughout the organization and will eventually result in long-term cultural change (Antony, Escamilla & Caine, 2003; Lubowe & Blitz, 2008; Kamensky, 2008). With regard to management systems, Snee (2010) listed the following mistakes commonly made in implementing LSS:

- ◆ little leadership from top management, including deployment plans;
- ◆ poor or infrequent management reviews;
- ◆ top talent not used;
- ◆ poor support from finance, IT, HR, etcetera;
- ◆ the focus on training and not improvement;
- ◆ poor communication of initiatives and progress;
- ◆ lack of appropriate recognition and reward.

From an analysis of Caterpillar Inc and other companies that use LSS, it was clear, inter alia, that leadership’s commitment to play an active and enthusiastic role in the LSS approach, contributed to superior financial performance and organizational change. Snee (2010) states the following in this regard: “Lean Six Sigma is an effective leadership development tool”, to enable management to change processes and enhance customer satisfaction. Management support is therefore key to ensure success when introducing improvement methodologies, senior management support and even active participation is required (Bicheno & Holweg, 2009; Oke, 2007; Peters & Waterman Jr., 2004). According to Perry (2009), lean management relies on cross-functional teamwork and is based on

“active project-based communication and problem-solving”. This could only be possible if the company has support from management in all the different departments.

3. Results

From a review of the documents relating to the LSS approach in Company A, it was evident that a team approach in which project teams are established and project leaders are appointed formed the basis of all the improvement plans. During the research at Company A, documentation relating to the introduction of LSS acknowledged that although both SS and Lean methodologies work well individually, the combined methodologies reduce defects and deliver products and services more quickly. These documents also referred to the five steps of good maintenance (5S) applied in the Company. The 5S acronym refers to the Japanese words, Seiri (sort), Seiton (order), Seiso (clean), Seiketsu (standardise) and Shitsuke (self-discipline), which are fundamental techniques to increase efficiency and productivity, while also ensuring a pleasant organizational climate (Titu, Oprean & Grecu, 2010).

In order to determine whether managers in Company A support the LSS approach to problem solving and to determine their perceptions of how customer focused LSS is, the data from the interviews was interpreted according to the different management levels of the interviewees. To ensure their anonymity, the responses of the managing executives, executives and senior managers were collated. The responses of managers and operational managers were shown separately.

Table 1 provides a summary of managers’ perceptions of the support for LSS in Company A. Recurring positive ideas were grouped according to three different themes:

- ◆ Theme 1: What managers do to support LSS.
 - ◆ Theme 2: What they expect other to do.
 - ◆ Theme 3: General attitude towards the LSS process.
- All the negative responses were grouped together under one heading. Notably, the respondents did not always mention LSS as such, but in some instances, only referred to SS or Lean.

Table 1. Interviewees’ perceptions of management support for LSS

Management level	Interviewees’ perceptions
<p>Managing executives, executives and senior managers</p>	<p>Positive:</p> <p><u>Theme 1: What managers do to support LSS:</u></p> <ul style="list-style-type: none"> ◆ We apply the principles, but it does not mean we apply [them] to the rule. ◆ I measure them on it and put it in their performance contract to make sure they produce a certain amount of Lean ideas during the year. ◆ Provide team members with Lean certificates and give them incentives. ◆ We have monthly meetings to try and motivate them to see the bigger picture. <p><u>Theme 2: What they expect others to do:</u></p> <ul style="list-style-type: none"> ◆ I have asked my team to sit with the LSS champion’s team just to reinforce the concept and get them to answer their questions and reinforce their buy-in. <p><u>Theme 3: General attitude towards the LSS process:</u></p> <ul style="list-style-type: none"> ◆ It actually corrects other problems further down the line. ◆ It was never acknowledged as one of the better vehicles to turn challenges around; it took me two years to see the benefits of the process. ◆ We’re measured on the service we deliver to customers. <p>Negative/indifferent:</p> <ul style="list-style-type: none"> ◆ Project managers do not have enough dedicated time to do the work – you have to sacrifice after hours. ◆ In terms of LSS, we do not give that amount of focus on it. ◆ There is some indifference towards it – some people oppose the idea of being tested. ◆ One or two management teams do not think it is necessary.
<p>Managers</p>	<p>Positive:</p> <p><u>Theme 1: What managers do to support LSS:</u></p> <ul style="list-style-type: none"> ◆ We got rid of waste and motivated the staff at the end of the day. ◆ I was on the course, we’ve officially been taught about the green belt, the SS and how it fits in together. ◆ From a manager’s side, I always like to find ways to do things differently, better to cut out waste and to cut out unnecessary processes. ◆ I support my staff to get things done better, come up with new ways and ideas. ◆ Every project that I do is built around the DMAIC framework. ◆ Lean is about go and see, it is about looking at the obvious – you are going to see things that can be changed, but we are doing things because it has been done in the past. ◆ Lean and SS provide an opportunity to move away from crisis mode where you can plan and where you can actually do the work that’s actually adding value, not only for the company but from looking from a customer’s perspective. ◆ Think in a certain way ... how can I improve where there is waste or we are wasting time. <p><u>Theme 2: What they expect others to do:</u></p> <ul style="list-style-type: none"> ◆ Where you actually make it part of their KPIs they must look at certain processes and come up with ideas. <p><u>Theme 3: General attitude towards the LSS process:</u></p> <ul style="list-style-type: none"> ◆ The DMAIC framework actually allows you to make sure that you cover all the different aspects and because each of the phases has certain deliverables, in order to meet these deliverables there’s a lot of tools associated with that. ◆ You need to understand what the problem is before you select the tool. ◆ If you look at any process in Company A, it’s obvious that you will see waste. <p>Negative/indifferent:</p> <ul style="list-style-type: none"> ◆ Not enough time, we as managers [have] been exposed to LSS, where we had to identify problems and come up with it, but it was like a crash course. Possibly if there’s a dedicated person running with it maybe it will work better. ◆ Mostly it is over and above your normal day-to-day activities and hence the reason why I said there’s no buy-in. ◆ We do not have this innovative energy thinking going and although we’ve been talking about it and we want to be an innovative industry or organization, we say it, but we don’t live it. ◆ We have many people sitting on top that also need to actually make that mind shift. ◆ We are not asking the why question. ◆ We are actually preaching this bottom-up approach and we are trying to enforce it from top down. ◆ I can’t force them to implement it. You have to have the management buy-in and they must agree with what you recommend.

Table 1 (cont.). Interviewees’ perceptions of management support for LSS

Management level	Interviewees’ perceptions
Operational managers	<p>Positive:</p> <p><u>Theme 1: What managers do to support LSS:</u></p> <ul style="list-style-type: none"> ◆ Whenever I can, I try to apply LSS in my head to shorten processes and deliver a better quality. ◆ We first have to determine what the problem is, I support it because you focus on the problem areas and you come up with a specific solution. ◆ Involve the whole team. ◆ I’ve developed tools to make sure that we are able to track and monitor each environment. ◆ We look at projects, where there are non-value-adding activities and we remove those. ◆ We look at the whole spectrum of SS from define to control – the whole DMAIC framework. ◆ Try and improve and remove barriers. ◆ We look at the 5Ss and share the basics of SS wherever we go. ◆ We impart the knowledge to the team we have helped. <p><u>Theme 2: What they expect others to do:</u></p> <ul style="list-style-type: none"> ◆ To shorten the delivery days they have to provide the customer with what they need. ◆ We didn’t explain to them SS, but they understood the purpose of the project. <p>Negative/indifferent:</p> <ul style="list-style-type: none"> ◆ Very difficult to change processes. ◆ We don’t have enough time and dedicated people to work on SS projects.

As shown in Table 1, the **senior management group** is aware of the LSS approach, but is not necessarily knowledgeable about it. According to Psychogios et al. (2012), the success of any LSS project is directly or indirectly linked to top management support. The interviewees were not negative about the process. From their responses it was clear that according to Theme 1, they support the LSS process by measuring performance and by providing incentives to those who participate in the process. One of the interviewees did mention that it is included in the team’s performance contract to produce a certain amount of Lean ideas during the year. Byrne et al. (2007) contend that companies that successfully implemented LSS not only improved business performance, but also had an inherent inclination towards innovative ideas.

It is evident from Table 1 that the **managers** were more knowledgeable and did more to support the LSS process. Some of them even did the training, at least at the Green Belt level. However, they mostly referred to SS and not to LSS. They embraced the DMAIC framework to problem solving but did not always feel that they had top management support for implementing the LSS approach. More than one interviewee indicated that top management must “live” the principles and not just preach them. Snee (2010) emphatically stated that “active senior management leadership” is one of the key characteristics necessary to make LSS work. The interviewees mostly felt that not enough dedicated

time is spent on LSS initiatives. With regard to theme 2, some of the interviewees also felt that the LSS approach should form part of all the teams’ key performance indicators (KPIs), in order to come up with cost and time-saving ideas.

As indicated in Table 1, the **operational managers** are more involved in improving processes. Responses under Theme 1 clearly indicate that operational managers are actually implementing LSS principles to remove waste and streamline processes. Although they have a team approach, not all members are informed of the LSS methodology, but do understand the purpose of reducing waste and increasing efficiency. Interviewees also indicated that they follow the DMAIC framework. Some of them also pointed out that they follow the 5S principles in order to promote continuous improvement. On the negative side, they mentioned that there is not enough time and dedicated people to implement these principles and that probably is why it is difficult to change the existing processes.

The interviewees were also asked if they perceive the LSS process to be customer focused. From the literature review it is evident that customer satisfaction is one of the central goals of blending Lean and SS (Psychogios et al., 2012; Laureani et al., 2010; George, 2003). Management’s perceptions on how customer focused the LSS process in Company A is, are collated in Table 2. Responses were grouped as positive or negative, but specific themes could not be identified because the responses were too diverse.

Table 2. Interviewees’ perceptions on how customer focused the LSS process is

Management level	Interviewees’ perceptions
Managing executives, executives and senior managers	<p>Positive:</p> <ul style="list-style-type: none"> ◆ More internally focused ... Definitely focused on internal customers. ◆ External customers, I haven’t seen that coming through yet.

Table 2 (cont.). Interviewees' perceptions on how customer focused the LSS process is

Management level	Interviewees' perceptions
Managing executives, executives and senior managers	<ul style="list-style-type: none"> ◆ Push is to improve internal processes, that is why there is an internal focus. ◆ Tested new operations in our call center regarding way of operating, process flow and interaction in the value chain – customer feedback was very positive. ◆ If a turnaround used to be five days plus and suddenly it is reduced to three days the customer receives quicker results. ◆ At the end of the day everything we do impact[s] on the customer. ◆ We are looking at the bigger picture, doing things different[ly] from how we did it previously – we are more customer focused. ◆ We have a service level agreement (SLA) – feedback on how well we perform against the SLA ◆ The team has a customer satisfaction KPI.
Managers	<p>Positive:</p> <ul style="list-style-type: none"> ◆ The whole methodology is to actually satisfy your customer. ◆ LSS is very customer orientated. ◆ I see other divisions as internal customers – get feedback from service managers. ◆ If LSS is implemented and everybody uses it, it will benefit the customer. ◆ We refer to the voice of the customer – LSS is focused on customer experience and customer requirements. ◆ Measurements should be according to customer needs and expectations. ◆ In any type of fault environment, communication to the customer is important – know where their frustrations with the processes are. <p>Negative:</p> <ul style="list-style-type: none"> ◆ Processes get implemented on management level, it should be right from the top. ◆ LSS is more about the practicalities on how to get the job done, the flow from one point to another – I don't know if it is focused that much on the customer.
Operational managers	<p>Positive:</p> <ul style="list-style-type: none"> ◆ LSS is hundred percent customer focused. ◆ Definitely focused on giving the customer a better service. ◆ We had to all come aboard and put the customer there and put us in their shoes and see what we can do. ◆ With LSS the penalties were lower and on the customer side the service was quicker. ◆ Look at voice of the customer, voice of the processes and voice of the business – do my processes address the needs of the customer? <p>Negative/indifferent:</p> <ul style="list-style-type: none"> ◆ Working in silos is a problem – service to the customer runs through all the silos, each one with its own rules. ◆ Greyish area – do I address the needs of the customer as a business or do we address the concerns of the business in terms of revenues, in terms of our shareholders? – They tend to lean towards the people who give us money.

Senior management distinguishes between internal and external customers. Although they acknowledge (see Table 2) that they should be focusing more on external customers, some interviewees indicated that the focus is more on improving the processes. This will ultimately impact positively on customer satisfaction, but it would seem that the starting point is not the external customer.

Table 2 clearly shows that the **managers** strongly feel that the whole LSS methodology is focused on customer experience and customer requirements. One interviewee, however, did mention that LSS is more about the process flow than customer satisfaction. According to Byrne, Lubowe and Blitz (2007), research has shown that management should not primarily think of LSS in terms of process improvement and cost reduction, but they should use it to find significant innovation opportunities to enable them to improve business performance.

Operational managers mostly commented that LSS is definitely customer focused (see Table 2) and that the needs of the customer should be addressed by introducing LSS methodologies. However, they did raise concerns about the fact that individual departments (silos) do not work together as a unit to serve the needs of the customers. Näsland (2008), on the other hand, clearly advocates the importance of placing organizational improvement methods “under a systemic (process management) umbrella”. Another concern was that the business's short-term demands for increased revenue should rather be a priority among senior management. This is contradictory to Pfeifer, Reissiger and Canales's (2004) view that customer focus is a prerequisite for organizational success.

Conclusions and recommendations

In challenging financial times, businesses are continuously looking for ways and means to

improve service to their customers by accomplishing more, with fewer resources, and ultimately improving their financial performance. The literature review underscored the fact that LSS as a business improvement methodology is increasingly used in service industries. The blending of SS process quality tools and Lean process flow tools can effectively eliminate waste and defects while simultaneously accelerating the speed of processes in the organization.

Although telecommunications are a large part of today's economy, specifically in developing countries, it is evident that the application of LSS in telecommunications services has not been widely explored. It has been noted throughout the literature that management support, especially that of top management, is imperative to successfully improve service functions when introducing and applying LSS methodology.

Notwithstanding the above observations from the literature, it became evident during the interviews at Company A that although senior management are aware of the LSS approach, it is not really driven from the top. At middle management level, the interviewees were more aware of LSS and actually applied the DMAIC framework in some instances. The operational managers indicated that they try to implement LSS at grass-roots level, but it is difficult to change established processes. A recurring theme was that in order to really be successful, there is not enough dedicated time to implement LSS methodology in the company and not enough focus on it.

Most of the interviewees perceived LSS to definitely be a customer-focused methodology and that it takes the "voice of the customer" into account. One operational manager even remarked that it is 100% focused on the customers' experience. However, some interviewees indicated that the focus of top management is more on internal customers, meaning the various divisions in Company A, rather than on the external customers. It is noteworthy that while top management's responses were more positive, managers and operational managers expressed their concerns on how customer focused LSS is.

From the literature and the responses of managers interviewed, it is recommended that, in order to successfully implement LSS as a continuous improvement methodology in a telecommunication organization, top management support is a prerequisite. Without it, the methodology would probably only be applied in certain projects and not in the business as a whole. It is imperative that top management undergo some level of training and promote it throughout the business. There is also a need for all the divisions in an organization to buy into the concept. The expectations of external customers should drive the improvement initiatives, and if LSS is implemented correctly, this will ultimately lead to increased financial performance and improved shareholder value.

Since this is a conceptual study supported by case study information of only one particular organization, results cannot be generalized. The study provides insight into the applicability of a LSS approach in a South African service organization and it lays a solid foundation for future research. This study however focuses primarily on the management issues that impact on customer satisfaction and not on the measurement of customer satisfaction or the technical application of these methodologies.

Since there is a dearth of empirical research into customer retention drivers, in particular in the telecommunications markets (Gerpott, Rams & Schindler, 2001), this study contributes to understanding the benefits and challenges of management support in a LSS approach and could therefore provide a useful source of information for other service industries, specifically in the telecommunication sector. It is imperative for companies that want to successfully adopt LSS, to take cognizance of the fact that various levels of management may have different perceptions of the implementation thereof and on how customer focused LSS is. Although decisions are usually taken at top management level, the case study at Company A shows that top management is not always aware of how middle- and lower management levels perceive it. This can impact negatively on the implementation, not only of LSS, but also on any other business improvement methodology.

References

1. Antony, J. (2004). Six Sigma in the UK service organizations: results from a pilot survey, *Managerial Auditing Journal*, 19 (8), pp. 1006-1013.
2. Antony, J., Antony, F.J., Kumar, M. and Cho, B.R. (2007). Six Sigma in service organizations: benefits, challenges and difficulties, common myths, empirical observations and success factors, *International Journal of Quality and Reliability Management*, 24 (3), pp. 294-311.
3. Antony, J. and Desai, D.A. (2009). Assessing the status of six sigma implementation in the Indian industry: results from an exploratory empirical study, *Management Research News*, 32 (5), pp. 413-423.
4. Antony, J., Escamilla, J.L. and Caine, P. (2003). Lean Sigma, *Manufacturing Engineer*, 82 (2), pp. 40-42.

5. Arnheiter, E.D. and Maleyeff, J. (2005). The integration of lean management and Six Sigma, *The TQM Magazine*, 17 (1), pp. 5-18.
6. Athanassopoulos, A.D. and Iliakopoulos, A. (2003). Modeling customer satisfaction in telecommunications: assessing the effects of multiple transaction points on the perceived overall performance of the provider, *Production and Operations Management*, 12 (2), pp. 224-245.
7. Ballé, M. and Ballé, F. (2009). *The lean manager: a novel of lean transformation*. Cambridge: Lean Enterprise Institute.
8. Bendell, T. (2006). A review and comparison of six sigma and the lean organizations, *The TQM Magazine*, 18 (3), pp. 255-262.
9. Bicheno, J. and Holweg, M. (2009). *The lean toolbox: the essential guide to lean transformation*. 4th edition. Buckingham: PICSIE Books.
10. Bicheno, J. and Pieterse, K. (2008). *The lean toolbox for service systems*. South African edition. Port Elizabeth: TriLean, 258 p.
11. Byrne, G., Lubowe, D. and Blitz, A. (2007). Using a Lean Six Sigma approach to drive innovation, *Strategy and Leadership*, 35 (2), pp. 5-10.
12. Chakrabarty, A. and Tan, K.C. (2007). The current state of Six Sigma application in services, *Managing Service Quality*, 17 (2), pp. 194-208.
13. Dahlgaard, J.J. and Dahlgaard-Park, S.M. (2006). Lean production, six sigma quality, TQM and company culture, *The TQM Magazine*, 18 (3), pp. 263-281.
14. Davies, T. and Boczko, T. (2005). *Business Accounting and Finance*. 2nd edition. Berkshire: McGraw-Hill Education, 767 p.
15. De Vos, A.S., Strydom, H., Fouché, C.B. and Delpont, C.S.L. (2005). *Research at grass roots: for the social sciences and human service professions*. 3rd edition. Pretoria: Van Schaik, 471 p.
16. Garg, A., Ghosh, D., Hudick, J. and Nowacki, C. (2003). Roles and Practices in Management Accounting today, *Strategic Finance*, 85 (1), pp. 30-35.
17. George, M.L. (2003). *Lean Six Sigma for services*. eBook: McGraw-Hill.
18. Gerpott, T.J., Rams, W. and Schindler, A. (2001). Customer retention, loyalty, and satisfaction in the German mobile cellular telecommunications market, *Telecommunications Policy*, 25, pp. 249-269.
19. Given, L.M. (ed). (2008). *The Sage encyclopedia of qualitative research methods*. Thousand Oaks, CA: Sage.
20. Henning, E., Van Rensburg, W. and Smit, B. (2004). *Finding your way in qualitative research*. Pretoria: Van Schaik, 179 p.
21. Hensley, R.L. & Dobie, K. (2005). Assessing readiness for Six Sigma in a service setting, *Managing Service Quality: An International Journal*, 55 (1), pp. 82-101.
22. Jeyaraman, K. and Teo, L.K. (2010). A conceptual framework for critical success factors of lean Six Sigma, *International Journal of Lean Six Sigma*, 1 (3), pp. 191-215.
23. Kamensky, J. (2008). Is Lean Six Sigma cool, *PA Times*, 31 (4), p. 9.
24. Khatibi, A.A., Ismail, H. and Thyagarajan, V. (2002). What drives customer loyalty: an analysis from the telecommunications industry, *Journal of Targeting, Measurement and Analysis for Marketing*, 11 (1), pp. 34-44.
25. Kumar, M., Antony, J. and Tiwari, M.K. (2011). Six Sigma implementation framework for SMEs – a roadmap to manage and sustain the change, *International Journal of Production Research*, 49 (18), pp. 5449-5467.
26. Kwak, Y.H. and Anbari, F.T. (2006). Benefits, obstacles, and future of six sigma approach, *Technovation*, 26, pp. 708-715.
27. Laureani, A., Antony, J. and Douglas, A. (2010). Lean Six Sigma in a call centre: a case study, *International Journal of Productivity and Performance Management*, 59 (8), pp. 757-768.
28. Liker, J.K. and Franz, J.K. (2011). *The Toyota way to continuous improvement: linking strategy and operational excellence to achieve superior performance*. NY: McGraw Hill, 450 p.
29. Lubowe, D. and Blitz, A. (2008). Driving operational innovation using Lean Six Sigma, *Business Performance Management*, 6 (3), pp. 10-15.
30. Murray, A.T. (2007). *The application of quality models and techniques in selected SMMEs in the Eastern Cape*. MTEch Industrial Engineering, Nelson Mandela Metropolitan University, Port Elizabeth.
31. Nakhai, B. and Neves, J.S. (2009). The challenges of six sigma in improving service quality, *International of Quality & Reliability Management*, 26 (7), pp. 663-684.
32. Näslund, D. (2008). Lean, six sigma and lean sigma: fads or real process improvement methods? *Business Process Management Journal*, 14 (3), pp. 269-287.
33. Nguenang, L.B. (2010). *An approach to Six Sigma implementation in South African enterprises*. MTEch Thesis, Cape Peninsula University of Technology, Cape Town.
34. Nienaber, H. (2010). Customer service: quo vadis? *International Retail and Marketing Review*, 6 (1), pp. 51-61.
35. Oke, S.A. (2007). Six Sigma: a literature review, *South African Journal of Industrial Engineering*, 18 (2), pp. 109-129.
36. Pepper, M.P.J. and Spedding, T.A. (2010). The evolution of lean Six Sigma, *International Journal of Quality & Reliability Management*, 27 (2), pp. 138-155.
37. Perry, B. (2009). *Enterprise Operations, CIMA Official Learning System, Paper E1*. London: CIMA Publishing, 330 p.
38. Peters, T. and Waterman Jr., R.H. (2004). *In search of excellence: lessons from America's best-run companies*. London: Profile Books, 360 p.

39. Pfeifer, T., Reissiger, W. and Canales, C. (2004). Integrating Six Sigma with quality management systems, *The TQM Magazine*, 16 (4), pp. 241-249.
40. Pieterse, K. (2007). *Leaning the South African way: implementing lean manufacturing in the Rainbow Country*. 2nd edition. Port Elizabeth: Trilean, 139 p.
41. Psychogios, A.G., Atanasovski, J. and Tsironis, L.K. (2012). Lean Six Sigma in a service context: a multi-factor application approach in the telecommunications industry, *International Journal of Quality & Reliability Management*, 29 (1), pp. 122-139.
42. Salah, S., Rahim, A. and Carretero, J.A. (2010). The integration of Six Sigma and Lean management, *International Journal of Lean Six Sigma*, 1 (3), pp. 249-274.
43. Shah, R., Chandrasekaran, A. and Linderman, K. (2008). In pursuit of implementation patterns: the context of Lean Six Sigma, *International Journal of Production Research*, 46 (23), pp. 6679-6699.
44. Snee, R.D. (2010). Lean Six Sigma: getting better all the time, *International Journal of Lean Six Sigma*, 1 (1), pp. 9-29.
45. Struwig, F.W. and Stead, G.B. (2013). *Research: planning, designing and reporting*. 2nd edition. Cape Town: Pearson, 290 p.
46. Titu, M.A., Oprean, C. and Grecu, D. (2010). *Applying the Kaizen method and the 5S technique in the activity of post-sale services in the knowledge-based organization*. Proceedings of the International Multi Conference of Engineers and Computer Scientists, Vol III, IMECS, March 17 to 19, Hong Kong.
47. Yin, R.K. (2009). *Case study research: design and methods*. *Applied social research methods series*, vol 5. 4th edition. Thousand Oaks, CA: Sage.
48. Zhang, Q., Irfan, M., Khattak, M.A.O., Zhu, X. and Hassan, M. (2012). Lean Six Sigma: a literature review, *Interdisciplinary Journal of Contemporary Research in Business*, 3 (10), pp. 599-605.