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# A Lean Six Sigma framework for the insurance industry: insights and lessons learned from a case study

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## Abstract

It has long been recognized in the literature that the Lean and Six Sigma methodologies can complement each other fruitfully. So far, however, researchers have not been able to derive definitive conclusions on how to combine these methods; furthermore, there is little research on how to apply them to service firms. We develop a framework for integrating Lean and Six Sigma instruments in the service industry, particularly in the insurance sector, and discuss it in the context of the insights we gained from a large-scale project carried out at a large German insurance company. We show how various instruments drawn from these two methodologies can be (a) adapted to the insurance industry and (b) combined productively to enable a company to achieve its strategy and goals. The conclusions we draw from these insights can help a wide range of companies customize the combination of the Lean and Six Sigma approaches to suit their specific needs.

**Keywords** Insurance industry · Lean · Process improvement · Six Sigma

**JEL Classification** G22 · L89 · M11 · M54

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## 1 Introduction

The insurance industry is currently undergoing significant changes. As a result of the prevalent low interest rates on the capital markets, the role of actuarial practice in enabling companies to achieve their ultimate goal of making profit and to create value is more important than ever. Fierce competition places upper bounds on increasing revenues (Heckl et al. 2010). As a consequence, operational efficiency and cost reduction are now at the center of attention. Against this background, many insurance companies try to optimize their internal processes with the eventual goal of achieving “leanness” and increasing the quality of their output (Koning et al. 2008).

Similar changes were observed in the car industry much earlier. In the late 1940s, Taiichi Ohno, a businessman and industrial engineer who worked with Japanese car manufacturer Toyota concluded that an unreliable supply meant missing parts, idle production plants and therefore higher costs. To mitigate these problems, in 1948 he devised the Toyota Production System, which he continued to develop into the 1970s. In the late 1980s, Ohno’s Toyota Production System evolved into Just in Time (JIT) in the US (Shingo 1988; Pepper and Spedding 2010). While JIT is expensive and does not suit all production settings, most firms can benefit from the broader principles underlying the concept. Lean Manufacturing (referred to simply as “Lean” hereafter) puts emphasis on the reduction of waste (“muda”), which is defined as every activity that does not add value for the customer but consumes resources (Womack and Jones 2013). Solving problems that result from poor quality requires extra work, which is regarded as a waste of time. For that reason, Lean strives for perfect quality (Womack et al. 1990; Womack and Jones 2003). As a consequence, quality improvement concepts such as Six Sigma or Kaizen gain recognition resulting in a simultaneous application of Lean and Six Sigma (Harry and Schroeder 2000; Spear 2004). This is also partly due to the overlap between these two methods (Hahn et al. 1999; Bhasin and Burcher 2006; Salah et al. 2010). Snee (2010, p. 10) defined this combined approach, which has been dubbed “Lean Six Sigma” (LSS hereafter) as “a business strategy and methodology that increases process performance resulting in enhanced customer satisfaction and improved bottom line results”. According to Antony et al. (2017, p. 1073) “Lean Six Sigma [...] has become one of the most popular and proven business process improvement methodologies organizations have ever witnessed in the past”.

Research shows that combining Lean and Six Sigma can benefit not only the manufacturing industry but also service firms (Bowen and Youngdahl 1998; Mader 2008; Laureani et al. 2010). It is therefore highly plausible that employing the demonstrably effective LSS approach could help companies tackle the struggle that the multibillion-euro insurance industry is going through. However, neither researchers nor practitioners have found an optimal way to combine LSS either in general or in the insurance industry (Paton et al. 2011; Sunder et al. 2018). This study aims to develop a conceptual framework for integrating Lean Manufacturing and Six Sigma, show how these methods and the instruments they

provide can be modified to fit the insurance industry, and provide insights on an ongoing LSS implementation approach to bring research and business practice together. Several studies on LSS echo what Vashishth et al. (2019, p. 460) pointed out recently; namely, that “financial service organizations do need a roadmap for implementing LSS and this is clearly lacking in the existing literature”. The authors moreover emphasize the need for developing an LSS toolkit customized to the banking, financial services and insurance (BFSI) sector. With this need in mind, in this study we present the insights we derived from a large-scale case study of a German insurance company that implemented a customized LSS toolkit to improve its processes. We believe that our insights can benefit other companies in the insurance industry and potentially even in other service industries.

The following key features of our research make it unique in the literature to date: first, in the context of our case study, we developed a holistic conceptual LSS framework for realizing and implementing LSS projects in the service industry. Second, our framework, which incorporates state-of-the-art scientific insights, is flexible enough to be adapted for use in a specific department or across an entire company. We are aware that highly customized frameworks are harder to adapt to different contexts and of the trade-off between versatility and specificity. However, our results make us confident that we have struck the right balance. Third, we discuss in detail how specific instruments that are combined in an LSS framework need to be adapted to the needs and characteristics of the service sector in general and the insurance industry in particular. While designing our framework, we took these needs and characteristics carefully into account. Furthermore, we designed our framework so that a company can adapt it to the individual goals it defines as part of an LSS project. Our case study is also unique in that the setting is a company-wide LSS project to which we were granted comprehensive access and in which we also participated. This enabled us to collect and process comprehensive data and validate the design of our LSS framework on the basis of the project's outcomes.

Methodologically, a useful starting point for developing a holistic Lean Six Sigma concept is addressing both Lean and Six Sigma and contrasting their respective strengths and weaknesses. In the following, we apply this process to develop a general framework for combining and implementing individual tools from each approach, depending on the setting. We will then go on to refine and adapt our framework to the insurance industry, integrating specific Lean and Six Sigma tools in a stepwise manner into a “define, measure, analyze, improve and control” (DMAIC) process that is flexible enough to be used across this industry. To define our framework, we draw on the insights and experiences we gained from “Top 3”, a large-scale LSS project one of the co-authors initiated at the Versicherungskammer Group (VKG). Our involvement in this project gave us the opportunity to develop concepts that we were subsequently able to juxtapose to immediate practical experience. This, in turn, enabled us to integrate theory and practice on this important issue in a unique way. Our research can be seen as a direct response to the many calls in the literature for drawing on both theoretical and practical insights (Madhani 2018; Vashishth et al. 2019) in order to combine Lean and Six Sigma effectively.

According to Glaser and Strauss (1967), the close connection between conceptual and empirical work in case studies helps yield relevant and testable insights.

Furthermore, as Yin (2014) has argued, compared to quantitative research, qualitative research lends itself more to exploring complex relationships in their specific context. Our methodology is in line with these arguments as well as with existing research on Lean and Six Sigma in the service industries, which largely consists of case studies (Sunder et al. 2018).

Our contribution to the literature is twofold. First, we develop a framework for combining Lean and Six Sigma and adapt it to the service sector; more specifically the insurance industry. The potential and practical relevance of combining Lean and Six Sigma has encouraged researchers such as Thomas et al. (2008), Snee and Hoerl (2007) and Pepper and Spedding (2010) to create *strategies* and other researchers, such as Kumar et al. (2006), Salah et al. (2010) and Thomas et al. (2009), to develop *frameworks* for the successful integration of Lean and Six Sigma across industries. However, despite the relevance of LSS to the service sector as a whole and the difficulties that many companies in this sector face when it comes to applying this approach successfully, research on designing an LSS framework for the specific needs of the service sector in general and the insurance sector in particular remains scant (Antony et al. 2017; Madhani 2018). Previously, Koning et al. (2008) put forward an integrated LSS framework for the financial service industries. In line with that study, our framework is based on the same organizational infrastructure—specifically, the “belt system” and the DMAIC cycle—and uses the diagnostic and analytical tools Six Sigma offers, combining them with Lean tools and Lean thinking; namely, avoiding waste, rework, defective quality and anything that contributes to time wastage. However, in contrast to Koning et al. (2008), we show how companies can combine and adapt individual instruments and tools to a service context—specifically, in the insurance industry. Furthermore, we establish a connection between the company’s overall strategy and the Lean Six Sigma approach. In these respects, our framework differs also from the Lean Six Sigma frameworks that Madhani (2018) developed for the combined BFSI sector, whose underlying principle is that a company has to create customer value to raise shareholder value. As we share this fundamental principle, we go one step further, e.g. by examining how employee satisfaction influences bottom-line results.

Second, we validate our framework empirically by integrating it with case-study data to which we had unique access. The case-study design we chose is well-suited to pioneering research and theory-building (Eisenhardt 1989; Eisenhardt and Graebner 2007) and particularly apt for our research, given the scarcity of studies on LSS in the context of the service sector and particularly the insurance industry (Antony et al. 2017). Variants of LSS have already been successfully implemented in several international banks, including the Bank of America, Citibank (Ndaita et al. 2015), Merrill Lynch and UBS (Madhani 2018). However, there is little research on this approach in the rest of the broader BFSI sector including the specifics of the insurance industry (Delgado et al. 2010; Antony et al. 2017). Our study differs from the existing studies in several respects. Lokkerbol et al. (2012) examined various improvement projects involving processes carried out at fourteen different financial service organizations. The authors used their retrospective document-based observations to create project-specific “generic templates”, to help practitioners improve individual key performance indicators (such as revenue). In contrast, we develop and

describe a holistic program designed for improving processes across a large German insurance company, the VKG. Our detailed case study shows how our conceptual LSS approach enables a company to pursue and achieve several individual goals at the same time and how different departments can adapt the framework to their own needs but apply the methodology consistently with the rest. Wang and Chen (2010) studied how so-called inventive problem-solving can be integrated into the improvement phase of the DMAIC cycle as part of an LSS project at a savings bank. In contrast, we discuss how companies can integrate a broad variety of Lean and Six Sigma tools into a version of the DMAIC cycle specifically adapted to the insurance sector. Our comprehensive conceptual framework is also specifically designed to fit the current needs of insurance companies. Delgado et al. (2010) conducted semi-structured interviews with several managers of GE Money Portugal to document the lessons learned from the implementation of an LSS project at a bank. In contrast to their study, our paper documents how our own conceptual approach to LSS was implemented at an insurance company and reports the lessons learned at two different departments. In sum, our study details the trade-off between generalizability and flexibility that we had to consider when we designed our framework and the insights we derived from its implementation.

In the next section we develop our conceptual LSS framework and discuss the collection of our data in depth. In Sect. 3 we introduce the case company, the VKG, and the Top 3 project that we studied. Section 3.3 outlines how and why various instruments and concepts from Lean and Six Sigma were combined in the Top 3 project and how they were adjusted to the insurance context. In Sect. 5 we discuss how the combined methods were applied in two very different departments and the lessons learned from their implementation. Section 6 concludes the paper with an overview of the insights gained from our case study and the implications for the insurance industry and for the service sector more generally.

## 2 Developing the conceptual framework and methodology

### 2.1 The rationale for combining Lean and Six Sigma

Six Sigma, as Schroeder et al. (2008, p. 540) explain, is employed as “an organized, parallel-meso structure to reduce variation in organizational processes by using improvement specialists, a structured method, and performance metrics with the aim of achieving strategic objectives”. According to Andersson et al. (2006), the ultimate objective of Six Sigma is to improve financial results (e.g., by cutting costs or improving quality), which implies that other goals, such as achieving high customer satisfaction or employee satisfaction, are of secondary importance. Following the rationale that “better quality leads to increasing profits” (Freiesleben 2006, p. 24), Six Sigma aims to reduce product defects and improve quality and thus bottom-line results. For Six Sigma to achieve this, companies are required to follow a structured procedure, employ well-trained specialists and make use of various types of (statistical) data. Indirectly, improving quality affects customer satisfaction positively (Freiesleben 2006; Salah et al. 2010). In general, Six Sigma is best used

in case the process average needs to be shifted or the process variation has to be reduced (Snee and Hoerl 2007; Snee 2010).

Lean is widely described in the literature as both an approach to management that comes with specific tools and techniques (Shah and Ward 2003; Li et al. 2005) and as a philosophy associated with various broad principles and goals (Womack et al. 1990; Liker 1998; Spear and Bowen 1999; Bhasin and Burcher 2006). Shah and Ward (2007, p. 791) define Lean as follows: “Lean production is an integrated socio-technical system whose main objective is to eliminate waste by concurrently reducing or minimizing supplier, customer, and internal variability”. Although the authors defined Lean in the context of the manufacturing industry, their definition applies also to other industries, including the insurance industry on which we focus, for two reasons. First, it highlights the importance of eliminating waste; second, it integrates people and processes from an internal perspective and customers and the company from an external one. To eliminate waste, Lean improves the flow of material and information and reduces the complexity of processes along the entire value chain (Andersson et al. 2006; Salah et al. 2010). In addition, satisfying customers is one of Lean’s overarching goals (George et al. 2003; Snee and Hoerl 2007; Snee 2010).

Compared to Six Sigma and its highly sophisticated statistical and analytical tools, Lean is much simpler and more hands-on (Salah et al. 2010). Both approaches are project-based (Andersson et al. 2006) and share the fundamental principle of continuous improvement, which is also known as *Kaizen*. However, whereas Lean prepares all employees of an organization for continuous improvement, Six Sigma’s way to continuous improvement is less focused on the individual employee’s capabilities, but rather relies more strongly on the scopes of a series of individual projects (Salah et al. 2010). Both methods stress equally how important it is for the top management to demonstrate commitment and provide support (Yang 2004; Salah et al. 2010) and, in that sense, both take a top-down approach (Salah et al. 2010). However, Lean places greater emphasis than Six Sigma on trusting and empowering people (Salah et al. 2010). Drawing on interviews with professionals and academics, Antony (2011) found that Six Sigma requires longer training and a larger investment than Lean. Finally, Lean is generally regarded as a method for reducing the inefficiency of processes, whereas Six Sigma is regarded as more suitable for improving the effectiveness of processes (Antony 2011).

This overview of the differences and similarities between Lean and Six Sigma indicates that they are complementary in their strengths and weaknesses. Lean’s strengths include focusing strictly on the customer, analyzing the value stream in detail (Womack and Jones 2003; Koning et al. 2008) and ensuring that all organization members contribute their expertise and in-depth knowledge to developing and implementing lean processes. Furthermore, Lean makes use of standard tools to solve common problems, which, as research shows, is an efficient way of optimizing processes. The basic philosophy of Lean—avoiding waste—is plausible, easy to communicate and therefore likely to be widely accepted throughout an organization (Töpfer 2009). However, because Lean emphasizes staff involvement, to implement this method staff need to be open-minded as well as open to change and to being given greater autonomy in decentralized organizational structures (Bhasin and Burcher 2006). More importantly, the Lean approach does not offer much



guidance on how an organization can ensure the availability of the necessary capabilities to coordinate extensive, innovative and often very different improvements in every department (Koning et al. 2008).

One of the main advantages of the Six Sigma approach, to which Schroeder et al. (2008) also allude, is that it relies on the so-called Black Belts; that is, full-time specialists who head the improvement projects. These specialists conduct procedures and apply methodology while regular business activities continue. Black Belts typically build their work on DMAIC, the highly structured approach to project organization that we mentioned earlier (Swink and Jacobs 2012). While this well-organized system that relies on specialists and on making use of statistical data can boost a company's profitability dramatically, it is often perceived as too complex (Drohomeretski et al. 2014). Using Six Sigma to solve simple problems with fairly obvious solutions has been likened to breaking a butterfly on a wheel (George 2002). Furthermore, to implement Six Sigma and particularly to train Black Belts and supporting staff, the so-called Green Belts, requires considerable investment (Antony 2006; Fammy 2006). Another potential problem is that, to assess whether an organization is in a position to apply Six Sigma, it is necessary to have high-quality data. If such data are not readily available, gathering them can be a challenge (Antony 2006). Finally, Six Sigma projects often focus on isolated parts of the value chain. Not taking into account the bigger picture, however, can lead to suboptimal results along the value chain and undermine the goal of value creation (Koning et al. 2008).

Our overview of Lean and Six Sigma shows that despite their differences, they share a considerable amount of common ground. Moreover, because of their specific strengths and weaknesses, these two approaches are complementary, which makes the idea of combining them particularly appealing (Pyzdek 2000; Breyfogle et al. 2001; Arnheiter and Maleyeff 2005). For example, poor quality is a main reason for rework and, from the Lean perspective, the time used for rework is wasted (Womack et al. 1990; Womack and Jones 2003). Considering that Six Sigma strives for the best possible quality, implementing its methods could contribute to achieving leanness.

With regard to how complex and how easy to communicate these two approaches are, Salah et al. (2010, p. 258) argue that "lean is more suitable for blue collar and Six Sigma is for white collar". The authors concluded that only a combined approach can take into account different concerns and knowledge and reach everyone in an organization. By merging Lean and Six Sigma it is possible to create a superior methodology for improving processes that can "reach a wider range of competitive priorities compared to the isolated application of the models" (Drohomeretski et al. 2014, p. 820). A hybrid program comprising Lean and Six Sigma can help companies not only reduce costs, but also increase organizational speed, improve the quality of their products and services and react more flexibly to customer demands (Bhuiyan and Baghel 2005; Drohomeretski et al. 2014). The compatibility of Lean and Six Sigma and the potential of combining them is also evident in the popularity of LSS among practitioners and consultants (George 2002; Snee 2010; Sarkar et al. 2013).

For all the reasons we outline above, combining the methodologies of Lean and Six Sigma is an excellent way to improve processes, and therefore the quality of the



products and services that companies provide, and to reduce costs in the insurance industry (Koning et al. 2008), on which we focus. As we will show, our LSS framework enables insurance companies to increase not only customer satisfaction, profitability and efficiency, but also employee satisfaction.

### 2.2 The conceptual framework

Although researchers have called for the integration of Lean and Six Sigma in the financial sector and despite the practical relevance of an integrated LSS approach, currently, concrete suggestions on how to combine the two methodologies are far and few between (Vashishth et al. 2019). The conceptual framework we developed in connection with the VKG’s Top 3 project comes to fill this gap, as it draws on the methodologies and tools of both Lean and Six Sigma. Figure 1, which displays the preliminary outcomes of this ongoing project, illustrates the integrated LSS approach we will be discussing at length in the following. For reasons of clarity, at

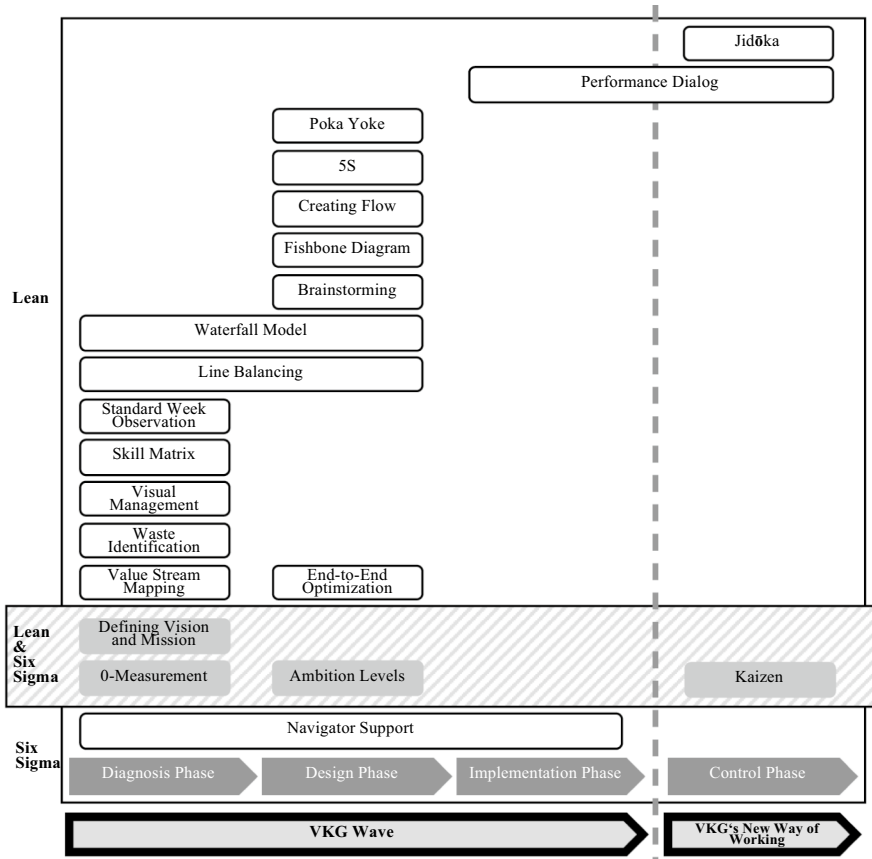


Fig. 1 The conceptual framework of integrating Lean and Six Sigma (Source: Own)

this stage, we only introduce the overall concept and underlying thought, rather than going into the details of the various instruments selected despite them being already included in the figure. We will make according reference to Fig. 1 in Sect. 4 of the article when we discuss in-depth the details of the entire framework with a focus on the peculiarities of the insurance industry. After all, we argue that the methodologies and tools that are individually well accounted for in literature need to be adapted to the particular features and needs of this specific branch because most of them have originated from a manufacturing context. What is more, sensibly selecting and combining individual instruments from the entire toolboxes of Lean and Six Sigma is crucial and, as we will see later on, in the case of the Top 3 project that we studied and participated in at the VKG, careful thought went into the corresponding decisions. Figure 1 comprises the preliminary result (project still ongoing), which we will elaborate on more carefully in Sect. 4 after having introduced the case.

Six Sigma's DMAIC cycle, on which our framework rests, constitutes a sound basis for implementing the combined LSS method, as other researchers have pointed out (Snee and Hoerl 2007; Koning et al. 2008; Salah et al. 2010). The DMAIC cycle enables organizations to determine the order in which specific actions need to be carried out. The flow-chart in Fig. 1 along the x-axis shows the steps of the DMAIC cycle, which were adapted to the VKG's Top 3 project, and the tools that were used during each phase of the project. The y-axis indicates whether these tools are more closely associated with Lean or Six Sigma or whether they are used to the same extent in both approaches.

To design this flow chart, we followed a stepwise approach: we identified which concepts might be usefully connected to which tools in order to achieve specific goals and then added complementary tools until we had a complete set. To indicate what each method contributes, we differentiate between Lean and Six Sigma tools. More specifically, in the early stages of a project, companies should favor "broad-spectrum", versatile instruments over "narrow-spectrum" instruments that can only be used in very specific settings and appraise continuously the progress of their approach, adjusting the selection of tools as necessary. More specific tools can be added later on to complement or replace other tools. Which tools are added in the course of the project depends on the particular setting, goals and core tools. After each addition, the project managers need to evaluate whether the updated LSS toolkit suffices for achieving the set goals efficiently; that is, with complementary tools and minimal friction (see Sect. 2.1). When the customized LSS approach has been satisfactorily fine-tuned, it can be put into practice and adjusted as necessary in the course of the project.

Figure 1 makes clear that the adoption of our conceptual framework is designed to be open-ended, in the sense that it has a clear starting point but no fixed end point. We designed this approach around internal processes and with the aim of involving everybody in the organization. The LSS approach should be introduced to each department according to a precise schedule—in the case of the Top 3 project, these introductions were called Waves and each Wave was carried out by trained specialists, the "Navigators".

Training is essential for keeping the DMAIC cycle running and for sustaining the achieved improvements in the long term. Improvement specialists train all staff to

apply the LSS methods to increase the efficiency and quality of processes in their areas of responsibility. Once the staff of a department have completed their qualification and start implementing the LSS method, they become responsible for developing this method further and continuing to improve the processes in which they are involved beyond the end of their Wave.

### 2.3 Data collection

The VKG's Top 3 project offered us a unique opportunity to develop and test our conceptual combination of the Lean and Six Sigma methods for the insurance industry. The company granted us access to staff and documents relating to the Top 3 program, as well as permission to publish copious data on financial figures, lessons learned and other information. We collected our data by conducting semi-structured interviews in late 2019 with VKG staff from various hierarchical levels: we spoke to the improvement specialists called "Navigators" and to staff members who were temporarily involved in Top 3. Our interviewees included the program director of Top 3, the business unit manager of operations in health insurance and the head of the department that deals with the private health insurance offered specifically to civil servants. To derive the lessons learned that we report in Sect. 4, we interviewed the head of the Reimbursement Operations in Health (ROH) department, the department accountant and the managing director of the Basic IT Support (BITS) division, as well as the "Waveguides" in charge of the ROH and BITS Waves. Furthermore, we made extensive use of the comprehensive internal documentation on Top 3 project, including aggregated management reports on the project's progress across the company, training material for staff and Navigators and detailed documents on the different stages of the ROH and BITS Waves, such as kick-off presentations and reports on each department's status before, during and after the Waves. Additionally, we participated in meetings on managing the Top 3 project as such as well as in departmental meetings. The latter included bi-weekly meetings on the status of the Top 3 project and six departmental meetings at the ROH department and the BITS division. Additionally, one of the co-authors, who is also the Group CEO of the VKG, arranged for us to have access to the otherwise confidential content of the quarterly board meetings at which the Top 3 project was discussed. Overall, the broad range of information sources to which we were given access enabled us to collect both qualitative data (e.g., on employee resistance to change) and quantitative data (e.g., on the achievement of financial goals). The diversity of our data enabled us to consider different perspectives, triangulate our evidence and thus strengthen and improve our concept of LSS (Eisenhardt 1989; Miles et al. 2014).

There is evidence that the approach we followed reduces the likelihood that either the researcher or the reader will misinterpret information (Stake 2005) and mitigates the common concern that the methodology of case studies "lacks the rigor and objectivity of the quantitative approach" (Patton and Appelbaum 2003, p. 60). To refine our LSS approach and to test the generalizability of our findings, we observed closely how the Top 3 project was implemented in two organizational units, ROH and BITS, following the approach of Lokkerbol et al. (2012). We examined these

specific organizational units because they reflect two “polar types” (Eisenhardt 1989, p. 537). More precisely, ROH deals with external customers, with which staff maintain personal relationships, while BITS deals with internal customers and focuses on technical mass solutions. Working with these markedly different organizational units enabled us to look across the company for patterns and contextual factors that influenced the success of Top 3 and to report a broader set of lessons learned.

### 3 Case description

#### 3.1 The characteristics of the VKG

The VKG, which was founded more than 200 years ago, in 1811, is Germany’s largest public insurer and the sixth-largest direct insurer. One of its 13 subsidiaries, the *Feuersozietät Berlin Brandenburg Versicherung AG* in Berlin, was founded much earlier, in 1718. This makes the VKG one of the oldest and most traditional insurance companies in Germany. Today, the company is characterized by its diverse product portfolio, which is offered to private individuals, freelancers, companies, agriculturists, regional authorities, churches and various other public institutions. Each of the VKG’s three main business areas—life insurance, health insurance and property insurance—contributes almost equally to the generation of annual revenue. In 2018 the VKG employed over 6,500 people and increased its total revenue by 2.5% to 8.3 billion euro. Apart from a diverse portfolio of numerous products and a heterogenous client base, the VKG also uses many and diverse sales channels. Examples include agencies, insurance brokers, in-house local sales stores, different types of banks and direct online sales through *BavariaDirekt*, a subsidiary operating on a purely digital business model. The VKG’s sales partner with the highest sales volume and main shareholder is a group of savings banks. The VKG sells only health insurance, long-term nursing care and travel insurance nationally. For all other offerings, Bavaria is the primary business focus, but Berlin, Brandenburg, Saarland and Palatinate are also significant. Its international business is negligible.

As Fig. 2 shows, the organization is run as a matrix with an executive in charge of each of its three business areas (i.e., property insurance, health insurance and life insurance) and five core functions. The latter comprise Sales & Marketing, Operations & Claims, Capital Investment, Human Resources and IT. In Fig. 2, we list “Product” as an additional function for semantic reasons. This structure is central to what can be considered a scalable business model that allows for future growth—for example, through mergers and acquisitions.

Relatively recently the company developed sub-strategies for all business areas and core functions, identifying the three distinct strategic fields of action shown in Fig. 2. The figure shows that the VKG’s strategy development has taken characteristics of the VKG as given and evolved around the traditional business model, which also becomes reflected in the organizational structure. Certain features of this business model are considered so vital to the firm’s success that modifying them is currently not an option. For example, the VKG has never sought to compete solely on the basis of efficiency and cost, with the ultimate goal of being the least expensive

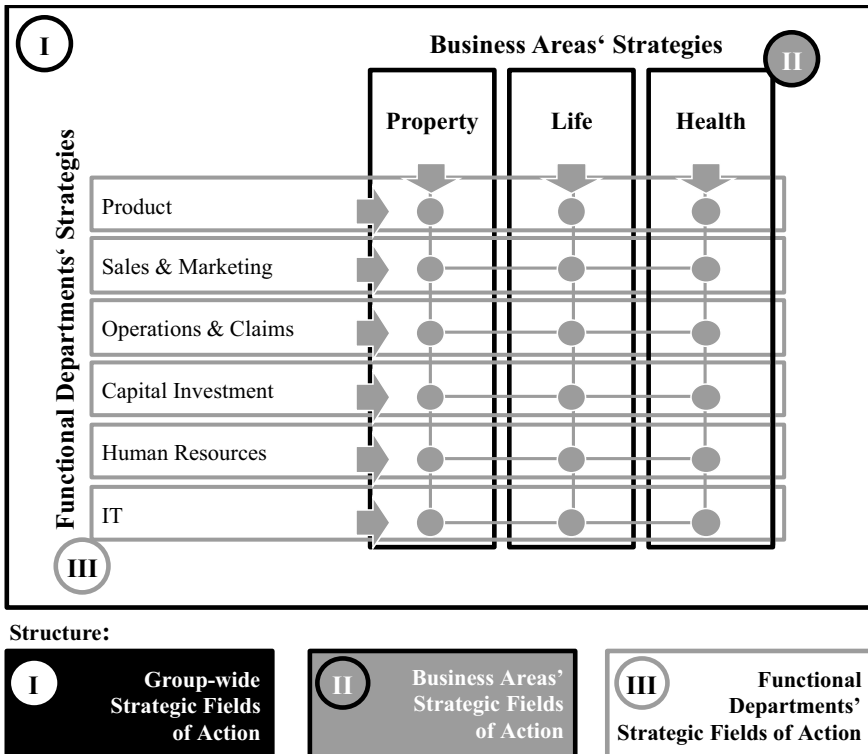


Fig. 2 The matrix organization at the VKG (Source: Sandner et al. 2018)

market participant, because this objective is incompatible with the need to insure clients comprehensively in all key areas of their lives. The VKG’s recent strategy development places quality of service and being close to the customer at the center of the company’s positioning. Local subsidiaries in Berlin and Saarbrücken have their own executive boards; this facilitates direct communication between important decision-makers and customers as well as local sales partners.

### 3.2 The starting point and goals of the Top 3 project

Customer satisfaction is an important indicator of whether the VKG’s overall strategy is successful. The so-called KUBUS study evaluates and benchmarks German insurance companies in relevant submarkets according to various criteria, one of which is customer satisfaction. Each year over 12,000 randomly chosen participants from all over Germany are surveyed for the study in computer aided telephone interviews (MSR Consulting Group GmbH 2019). In the case of the VKG, at the time of our research, the KUBUS data indicated that customer satisfaction had been declining. In 2014 and 2015, the VKG ranked in the bottom 30% of German insurance companies with regard to this particular measure. These

worrying results alarmed the company's executives, who, in response, decided to tackle the problem immediately. Their decision marked the starting point of the Top 3 project. The name indicates the project's ultimate goal; namely, to increase customer satisfaction until the VKG achieves a ranking amongst the best three insurance companies in Germany. The executives recognized that customer satisfaction comes right at the end of a long chain of changes and policies that follow a cause-and-effect pattern. The four main Top 3 goals reflect this awareness (Fig. 3).

The VKG's Top 3 goals are based on the assumption that quality is what drives customer satisfaction. Obviously, focusing more on customer needs and wishes—for example, by offering new products or adapting existing products to specific needs—can increase customer satisfaction directly. A company can also increase customer satisfaction indirectly; for example, by ensuring that staff are given more time to deal with customer requests. Given that hiring more staff goes against the VKG's cost-cutting strategy, the only option for the executives was to free up some of the staff's time by making internal processes more efficient. Improving processes (such as completing an insurance contract) reduces cycle times and customers tend to perceive speedy service as a mark of quality. Consequently, improving efficiency will increase, albeit indirectly, customer satisfaction. Another consequence of improving efficiency is that some manpower will become redundant. However, these employees can be transferred to understaffed departments. Such measures reduce costs immediately and can bring short-term success. In order to sustain success in the long term, the company invested some of the freed employee-time in innovation to ensure that it can sustain high quality, and therefore customer satisfaction, in the future. Importantly, the VKG acknowledged that, like any service company, it relies heavily on its employees and therefore needs to ensure that they too are satisfied: happy employees are more likely to stay with the company, more productive and more highly valued by customers





Four Goals	
<b>Customer Focus</b> 	Achieve consistently high customer satisfaction, as measured by relevant studies, e.g., KUBUS and customer barometer
<b>Efficiency</b> 	Free employee-time and make it available for more customer-focused activities
<b>Profitability</b> 	Use freed time and reduce material expenses to save costs and re-invest in future-oriented projects and activities
<b>Employee Satisfaction</b> 	Sustainably track and improve employee satisfaction and establish a culture of recognition and appraisal

Fig. 3 The Top 3 project's four goals (Source: Adapted from internal documents)

(Brown and Lam 2008). More generally, the VKG's example shows that increasing employee satisfaction is one of several steps towards increasing customer satisfaction.

The four main goals of the Top 3 project concern (directly or indirectly) increasing customer satisfaction but also tackling the broader challenges that insurance companies face. Although the VKG pursued all four goals simultaneously (Fig. 3), each department was allowed to focus on the one or two goals that mattered most for its operation. This flexibility made the implementation of different goals that ultimately benefit the company as a whole via the described cause-and-effect relationships appealing. The successful and well-established Balanced Scorecard (Kaplan and Norton 1992, 1996) is based on a similar logic. To track the Top 3 project's overall success and provide feedback, the VKG relies on data from the annual KUBUS study and on the more readily available company's own "customer barometer", a well-established survey tool at VKG. To date, the company has contacted more than four million customers, asking them to complete the online questionnaire. Of these, more than 150,000 have submitted feedback on their customer experience. The VKG uses a similar tool to collect data on employee satisfaction on a weekly basis in a standardized way. With regard to profitability, every department measures directly whether its own profitability has improved as a result of implementing the Top 3 approach.

### 3.3 The Top 3 management approach

The Top 3 project encompasses all internal processes and aims to increase quality, improve efficiency and reduce failure rates. Increasing employee satisfaction, enabling employees to feel proud of their work and freeing up precious time were pivotal to realizing the project's ambitious aims. The Top 3 management approach combines complementary tools and concepts that originate in Lean and Six Sigma but have been adapted to the toolkit of which they are part and to the specific context and characteristics of the VKG. Despite the significant overlap between the Top 3 goals on the one hand and the objectives of Lean and Six Sigma on the other, there are some differences. For example, Lean generally aims to improve efficiency by creating flow and to boost customer satisfaction by improving quality, while Six Sigma aims to create better bottom-line results by reducing variations and cutting costs. The Top 3 management approach, however, places much greater emphasis on employee satisfaction than on these aims, because employees play a central role in the services that the VKG provides.

The Top 3 project was launched in 2015. With an annual budget of about 10 million euro and everybody in the organization involved, it is one of the largest projects in the recent history of the VKG. As Fig. 4 shows, the CEO acted as the project's sponsor. Except the CEO and the CFO, all other executives, together with the Program Director and two key strategy consultants, constituted the project's Committee. The strategy consultants were more involved in the early stages of the project; their main task was to provide training and the first generation of full-time improvement specialists called "Navigators" as project managers.



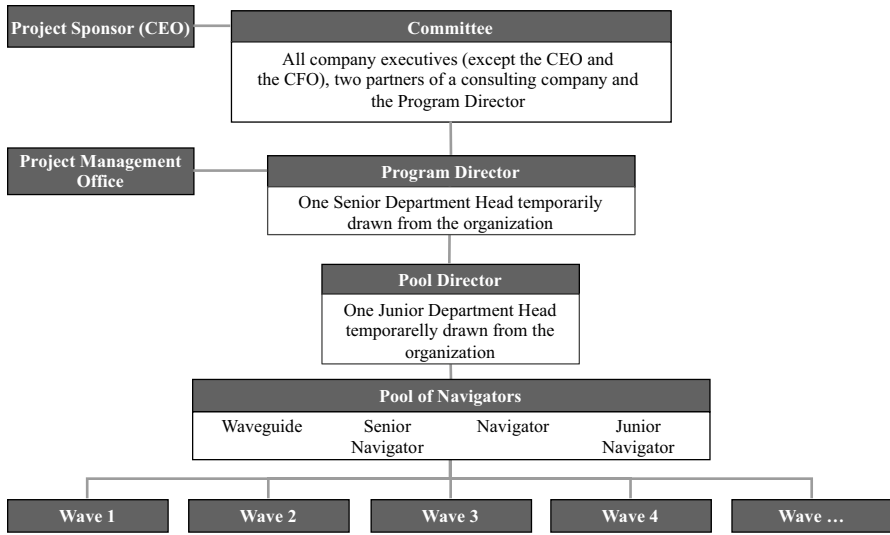


Fig. 4 The organizational structure of Top 3 (Source: Adapted from internal documents)

The Top 3 project was not launched at the same time throughout the whole company. Implementing the Top 3 approach in a specific department was called a “Wave” and each Wave took 12–16 weeks to be completed. The stepwise implementation of the project made it possible for each department to process the lessons previous departments had learned and to improve the system. The Top 3 project was first launched in the direct-sales department, in certain operations and claims departments and in the operations departments of the health-insurance division. Subsequently it was rolled out to other sales, operations and claims departments at VKG.

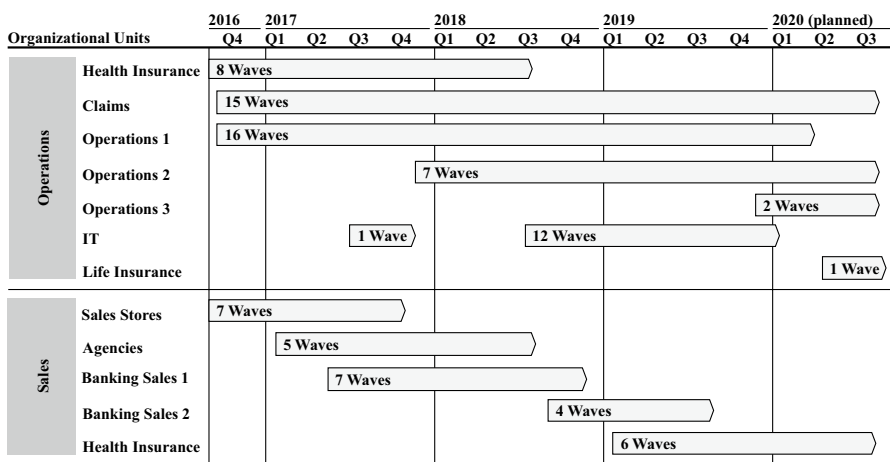


Fig. 5 Chronological order of Waves in operations and sales (Source: Based on internal data and documents)

The VKG's management selected the functions and business areas that would undergo a Wave and then planned the respective Waves in more detail, including the chronological order in which they would be launched (Fig. 5). This planning and preparation took about three years. The main criteria by which the order of the Waves was decided were (a) potential for improvement, (b) urgency and (c) availability of organizational resources, especially Navigators.

## 4 Combining Lean and Six Sigma in the insurance industry

### 4.1 Applying the conceptual framework to VKG

As Fig. 1 shows, each Wave comprises three steps: the *Diagnosis Phase*, the *Design Phase* and the *Implementation Phase*. In the *Diagnosis Phase* a detailed overview of the activities and processes of the department undergoing a Wave is generated. To that end, the Navigators measure the quality and performance of the relevant processes and, on that basis, assess the structure of the department in question and the behavior and abilities of the staff. These data, in turn, become the basis for the *Design Phase*, which comes next. At this stage, the Navigators, the department head and the employees jointly develop measures to achieve the Top 3 goals. Their suggestions for improvement are then implemented in the *Implementation Phase*, which completes the Wave. Each Wave is followed by the *Control Phase*, during which the department's staff continue the improvements and regularly check the results they have achieved. The structure of the Waves is based on Six Sigma's DMAIC method, which derives from the well-known "plan, do, act and control" (PDAC) cycle or Shewhart cycle (Deming 1986). Practitioners consider these structured approaches particularly useful for identifying the root causes of various problems. However, these approaches can also be seen as "meta-routines" that provide common points of reference within the company and therefore help integrate interdisciplinary processes (Schroeder et al. 2008).

For the needs of the VKG the DMAIC cycle had to be adapted. To begin with, every department only goes through a Wave, which is also referred to as a "Departmental Journey", once. Going through a Wave involves intense activity and completing it depends on full participation and teamwork among that department's staff. By the time the Top 3 project was launched, the VKG had already defined the project's overarching goals. As each department would have to contribute towards achieving these goals, the company considered it unnecessary to include a separate "Define" phase (similar to the DMAIC's equivalent first phase) on the departmental level. In the *Diagnosis Phase*, the VKG decided to combine efficiently measuring and analysis, which normally constitute two distinct DMAIC steps, with very satisfactory results. Conversely, the company chose to separate design (which involves more creative activities) from implementation (which is more technically oriented), although these are normally combined in the DMAIC's improvement phase. Finally, the VKG decided to exclude DMAIC's control phase from the Wave altogether and to establish it as a component of the daily routine in every department. The company also implemented a process of continuous improvement (*Kaizen*). This meant putting in

place in every department a specific process for resolving problems quickly when new challenges arise.

During its Wave, every department was supported by full-time improvement specialists, who were taken out of their regular job for a limited period of two to four years to serve as Navigators. The Navigators are selected from among the most talented employees of the VKG's line functions through an internal assessment center. Starting as Junior Navigators, they complete a one-week course of basic training in different methods and tools before going on to support more experienced Navigators in their first Wave. Junior Navigators who gain experience, further training and certificates can be promoted to "Navigator", "Senior Navigator" and eventually "Waveguide". A Waveguide oversees two to three Waves in one division at the same time. Senior Navigators are responsible for a single Wave in one department and are supported by two to three Junior Navigators and Navigators. Training covers the areas of communication, change management and moderation. A Junior Navigator needs to have gained experience in two or three Waves before being promoted to a Navigator; similarly, a Navigator needs to have completed two to three Waves before becoming a Senior Navigator. At the beginning of the Top 3 project in 2015, experienced employees from a large international consultancy served as the first Senior Navigators and Waveguides. These pioneers were responsible for training the first in-house Navigators. By 2019, the VKG had trained 50–60 Navigators of various ranks, which enabled it to conduct all Waves without external support. The Navigators are full-time improvement specialists who, as a whole, constitute a parallel meso-structure that closely resembles Six Sigma's "Belt" system (Schroeder et al. 2008).

## 4.2 The diagnosis phase

The VKG adapted to its needs and applied a combination of Lean and Six Sigma tools and principles in all phases of each Wave. Lean was used extensively in the *Diagnosis Phase*. A key tool is *Value Stream Mapping*, which allows a company to analyze and visualize the entire value stream (Womack and Jones 2003); that is, all processes involved in developing, producing and distributing a product. Analyzing the value stream regularly helps a company distinguish the activities that add value from the costumers' point of view from those that do not. Further analysis of the latter differentiates fairly necessary activities (such as quality-checking contracts) from completely unnecessary activities that need to be eliminated (such as entering the same customer data twice). The VKG used value stream analysis to observe every employee's regular workflow in every department at least once. This allowed the company to gain a comprehensive picture of the most profitable processes that are performed in every department.

The VKG also used *Visual Management*, which enables service companies to detect flaws in processes involving their mostly intangible products (Koning et al. 2008). In addition, *Line Balancing* allocated employee capacity and capabilities to the different steps of company processes as needed in order to prevent both costly overcapacity and undercapacity (Koning et al. 2008). The VKG used a *Skill Matrix*

to assess every employee's skills. Each assessment was carried out by both management and the employee in question. Where opinions diverged, both assessors sought to align them through open discussion so that every employee was assessed as accurately as possible. A further tool the VKG used is *Standard Week Observation*. This involves analyzing the work schedules of individual employees to identify unproductive time, i.e., waste. Finally, having documented and analyzed tasks, processes and skills in every department, the VKG performed a *0-Measurement*. The results of this analysis constitute the benchmark for assessing the improvements achieved through applying the Top 3 management approach.

The changes that the VKG introduced as a result of the Top 3 project posed tremendous challenges. For that reason, it became crucial that staff participated fully and accepted the project in a climate of openness and transparency. Ensuring that staff were involved in the project and using their local knowledge made the process improvement efficient (Wruck and Jensen 1994) and can thus be seen as key to the project's overall success. The company also organized regular workshops to bring together staff, departmental management and Navigators and to enable them to define clearly and unambiguously the *Vision and Mission* of the project. These workshops also allowed the participants to recap the *Diagnosis Phase* and enabled a smooth transition to the *Design Phase*.

### 4.3 The design phase

At the beginning of the *Design Phase*, the staff and management of the VKG department that was undergoing a *Wave*, together with the Navigators, used creative tools such as *Brainstorming* in combination with other tools such as *Fishbone Diagrams* and *Waterfall Models*, to discover the root causes of the weaknesses they had identified in the processes they had assessed (George 2002). The participants then defined *Ambition Levels*, which are explicit and measurable goals that are identical or at least positively correlated with one of the four specific goals of Top 3 (Fig. 3). Fundamentally, Six Sigma aims at the level of 3.4 defects per million opportunities in the course of a process. This means that a process, product or service needs to perform well 999,996.6 times and go wrong no more than 3.4 times, given 1,000,000 opportunities (Henderson and Evans 2000). This universal figure is based on data derived from the measurable and objectifiable quality of the processes and output in the manufacturing sector. However, at an insurance company like the VKG, because of the sheer number of mostly intangible processes that constitute the company's services and the degree of subjectivity these involve, Six Sigma goals vary from department to department. Nevertheless, despite this inevitable variation, the Top 3 goals had to be challenging and precisely defined for all employees (Linderman et al. 2003). This approach is backed by the literature, which shows that precise targets lead to better performance levels than vague, non-quantitative goals do (Locke and Latham 2002). The emphasis that Top 3 project places on the continuous evaluation of clear and measurable performance metrics has its origins in the data-driven Six Sigma approach (Bisgaard and Freiesleben 2004). Nevertheless, *Ambition Levels*

have to be accomplished within a specified period of time, which reflects the emphasis on speed that is associated with Lean.

During the *Design Phase*, every department needs to define feasible measures it can take to improve employee satisfaction, quality, customer satisfaction and profitability. After that, each department can go on to select the processes that need improvement and the tools to improve them with. The planned changes are introduced through what the VKG calls “Transformation Workshops”. Each department documents on Action Sheets the selected measures and the potential for improvement that the participants have identified. Tracking improvements continuously is typical of the Six Sigma methodology (Schroeder et al. 2008). In line with this approach, during the Top 3 project, the VKG tracked improvement in various areas continuously, rather than only when specific milestones had been reached or rather than waiting till the project had been completed. One important metric the VKG used to assess financial improvement regularly is the *loss ratio*; that is, the ratio of total losses incurred (paid and reserved) in claims, divided by the total premiums earned. Using this metric allowed the VKG to determine “the full dollar value” (Smith et al. 2002, p. 188) of the improvements that had been achieved through the stepwise implementation of the Top 3 project.

The VKG’s approach to improving existing processes in all departments follows a principle typical of Lean: *Creating Flow*. “Flow” means that all steps of the value-creation process can be completed successively and without interruption (Womack and Jones 2003). For a service company like the VKG, achieving this kind of flow means handling a customer request in a single attempt without the waste of waiting and queueing time. The Lean concept of flow also requires managers to reconsider the principle of decentralization, because dividing a company into several departments can create internal barriers (e.g., pursuing departmental interests rather than organizational interests) that hinder flow. With this in mind, the VKG chose to run Waves in individual departments as well as cross-functional Waves, which allowed it to identify areas for potential improvement across the entire company. By these means, the VKG achieved *End-to-End Optimization*, a Lean method that optimizes interfaces, eliminates redundant elements and speeds up processes.

To improve quality and, as a result, customer satisfaction and profitability, the VKG redesigned its processes wherever possible in line with the Lean concept of *Poka Yoke*. The purpose of this mechanism is to prevent errors before they occur. In effect, it ensures that each step in a (production) process is performed correctly and costly mistakes are not carried over to subsequent steps (Shingo 1986). For example, entering incomplete customer data will hinder the conclusion of an insurance policy. *Poka Yoke* helps identify the omission and complete the data and thus the process. Overall, the VKG relies on the *5S* (“sort, set, shine, standards, sustain”) methodology to implement flow and to reduce time wastage. Following this approach, it trains employees to *Sort* the workplace and get rid of tangible and intangible clutter, *Set* retained elements in order, make the place *Shine*, adhere to *Standards* to ensure the repetition of the first three “S” and *Sustain* and continuously improve the newly established order so that the company can remain efficient (Bicheno 2008).

## 4.4 The implementation phase

The *Implementation Phase* centered on daily so-called *Performance Dialogs*. These consist of brief department meetings that allow managers and Navigators to provide real-time feedback to employees on the department's progress in implementing the Top 3 improvements. To help everyone visualize progress and keep track of, e.g., what goals have been achieved at what pace and of the levels of customer satisfaction, the VKG used dashboards.

As explained earlier, the purpose of the *Control Phase* is to enable every department to sustain improvements and continue to improve (*Kaizen*) the processes that were optimized during a Wave. The VKG also adapted to its services and applied the Lean method *jidōka*, which helps identify deviations from set standards and correct flaws during, rather than after, a process. The *jidōka* method thus helps ensure that the output is of high quality. At the VKG, when dissatisfied customers give negative feedback through the customer barometer, their comments pop up on screens in the departments in real time. This enables staff to act immediately and “close the loop”. Typically, customer service will call dissatisfied customers instantly and attempt to find jointly a solution. The aim is to address the cause of dissatisfaction and resolve and eliminate the problem quickly, before the customer complains formally or walks away from the company. Responding fast to customer requests and, from the customer's point of view, satisfactorily, demonstrates that the VKG values every individual customer. Given that 75–80% of the customers the VKG has surveyed through the customer barometer agreed to be contacted afterwards, this approach to *jidōka* is an effective way of resolving individual customer problems and at the same time identifying and addressing problematic patterns in a process.

## 5 Selected VKG examples and lessons learned

### 5.1 Example A: the Reimbursement Operations in Health (ROH) Department

The VKG, particularly their subsidiary Consal Beteiligungsgesellschaft AG, offers private health insurance across Germany. A key area of the company's business is providing a particular type of private health insurance to civil servants. The competition in this specific market is fierce, even for the standards of the highly competitive general private health-insurance market in Germany. What is more, according to the KUBUS survey, customer satisfaction in this specific market is low, which might be partially explained by the dominance of outdated products and services. Finally, the highly individual character of this particular service makes it hard to standardize operations and processes and to implement efficiency goals in practice.

At the VKG six departments deal with this kind of private health insurance and the challenges we have just described. To demonstrate how the Top 3 project helped these departments tackle the problems they were facing, we chose to focus on the ROH department. The ROH employs 15 full-time staff who deal with sales, insurance claims and customer queries. This means that the ROH staff are constantly in direct contact with VKG customers and handle large amounts of sensitive material

regarding personal health issues—for example, in order to provide information to customers on the conditions that the VKG’s private health insurance covers.

Figure 6 reveals that, by the end of its wave, the ROH department had made considerable progress in all four Top 3 goals. According to the customer barometer, customer satisfaction had increased from 63.1% to 69.8%—a great success that in turn increased the company’s competitive advantage, given the poor ratings of customer satisfaction in this market. Additionally, the ROH department almost met the Top 3 efficiency goals, which are measured by the number of customer operations per employee per day: staff processed an average of 29.8 customer operations per day after the Wave, which is close to the target of 30.5. The ROH staff managed to increase profitability by reducing the loss ratio as a key performance indicator (KPI) to a value of 82.7%, which is not far below the target set at the beginning of the Wave (83.4%). Finally, employee satisfaction increased from 26.0% to 37.4%.

At the beginning of the *Diagnosis Phase*, ROH staff and executives, together with the Navigators assigned to the department, used *Value Stream Mapping* to gain an overview of the department’s activities and processes. Applying a *Skill Matrix* and *Standard Week Observation* helped identify the staff’s capacities and capabilities, which were matched to the visualized value stream. The latter had already enabled the participants to identify some unproductive time—in Lean terms, waste—and to progress to the *Design Phase*, which followed the *0-Measurement* benchmarking process.

The Navigators organized *Transformation Workshops* with the employees and the department head. Together they set the *Ambition Levels* for each of the four Top 3 goals. The ROH staff accepted unproblematically the KPIs that were applied to evaluate the efficiency and profitability of the department’s performance, as the same KPIs had already been used before the Wave. However, the daily, transparent, real-time reports on efficiency and profitability, which were generated in the Performance Dialogs by means of dashboards, were new and made the staff much



Fig. 6 Top 3 goal achievement in the ROH department (Source: Based on internal data and documents)



more aware of those indicators. This new awareness encouraged staff to make suggestions on how to improve various processes, products and services and therefore the results, as measured by the defined KPIs. One such suggestion, for example, was to simplify the design of the software interface that was used for the internal processes of payroll accounting.

These improvements in efficiency freed up time, which the employees invested in providing better quality customer service and thus strengthening customer relationships. For example, ROH staff now spend time to recommend doctors, give tips on additional benefits that an insurance product offers or just listen to anxious customers. Both customers and employees value demonstrable customer care and empathy tremendously, so, in this case, improving efficiency was very much in line with the Top 3 goals of increasing both customer satisfaction and employee satisfaction. Enabling staff to access customer feedback almost instantly through the customer barometer also helped the department achieve the Top 3 goals. Instant access to feedback allowed staff to measure the level of customer satisfaction and identify flaws in the department's products and services as well as improve their individual communication skills. Acting on feedback had a positive impact on both customer satisfaction and employee satisfaction. It also motivated staff daily to do a better job and help customers.

The *Design* and *Implementation* phases also resulted in a change that—perfectly in line with the Lean philosophy—increased efficiency by reducing the time it takes to complete a process and increasing customer satisfaction. Before the Wave, ROH staff communicated with customers mostly by letter. This has two drawbacks: first, the letters are often ponderous; second, delivering letters requires at least a couple of days. During the Wave, the department decided to use phone calls and e-mail much more extensively to communicate with customers, as these channels provide a much faster way of answering relatively unproblematic queries. This modification enabled employees to resolve simple problems in a single attempt.

The ROH example illustrates how improving flow can make processes more efficient, deliver results faster and, as a consequence, increase customer satisfaction. Staff participation in the Top 3 project was high at ROH and the feedback that staff, executives and Navigators exchanged was very positive. For that reason, it is not surprising that the department regularly uses the implemented problem-solving process that Fig. 7 illustrates.

This tool is based on *Kaizen* and ensures that staff continue to pursue all four Top 3 goals even after the Wave, i.e., in the *Control Phase*. Whenever a problem arises, staff discuss it and try to identify its root causes in the next scheduled *Performance Dialog*, regardless of whether it occurred during a previous *Performance Dialog* or during a process or was reported by a customer. In most cases, the problem cannot be solved immediately and is assigned to a member of staff, whose task will be to find a solution within a specified time frame. This individual then sets up a working group to generate ideas and to track progress. The solution to the problem and the results of the tracking process are shared in a subsequent *Performance Dialog* with the whole department and implemented in a timely fashion.

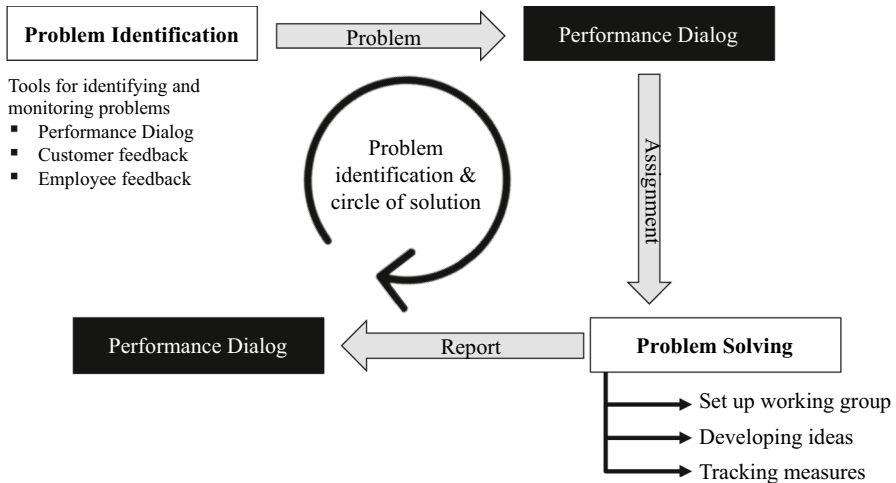


Fig. 7 The problem-solving process at ROH ( Source: Based on internal data and documents)

## 5.2 Example B: the Basic IT Support (BITS) Division

Digitalization is without doubt one of the most prominent trends in the market. The possibilities of combining artificial intelligence with big data appear to be unlimited. Pure digital insurance startups attract a lot of attention from investors and collect billions of dollars of equity capital (Walther et al. 2019). However, companies selling a broad range of products tailored to very specific demands still depend on the intelligence and empathy of their human resources—their employees—to satisfy their customers. In the case of companies such as the VKG, legal requirements also impede comprehensive digitalization, as some contracts still need to be physically signed by the customer. Therefore, it is necessary to ensure that VKG staff who are in direct contact with the customer receive basic IT support in four service areas: (a) print, (b) customer and workplace services, (c) administration of workstations and services for mobile devices, and (d) management of workstations and multimedia systems.

At the VKG, the division called BITS of the VKBit Betrieb GmbH (VKBit), a subsidiary wholly owned by the VKG, provides these services to internal customers, such as the ROH department. The subsidiary as a whole has around 200 employees and is responsible for the entire VKG IT infrastructure. Here we focus solely on the BITS division, which comprises four departments and employs around 100 staff in total. Each of these departments is responsible for one of the four areas listed above. At BITS the Top 3 approach was applied to all four departments simultaneously, because the challenges they face are very similar. The BITS example illustrates how an internal supplier of the VKG implemented the Top 3 approach and how the company managed a Wave that was launched simultaneously in more than one department.

One of the challenges the BITS division faced was the design of the automated ticketing system that assigns instantly customer requests to staff by a simple push process on the “first come, first served” basis. Customer requests, however, are highly heterogeneous in terms of complexity, so the time it takes to process a ticket and receive a new one varies widely. Before the Top 3 project was implemented, tickets were neither prioritized nor redistributed among staff. As a result, it was frequently the case that some employees would struggle to process all tickets assigned to them on time, whereas others would sit idly.

Although overall customer satisfaction was acceptable before the Wave, communication between BITS staff and its customers was often problematic. On the one hand, customers would frequently not provide the necessary information for staff to identify the root cause of a specific problem; this required staff to contact those customers repeatedly to request more details. On the other hand, BITS staff were more technically oriented than customer-focused, which hampered communication and resulted in misunderstandings. A third issue that needed to be tackled was that the BITS management structure had a negative impact on the division’s development. Executives were too preoccupied with the day-to-day business to see to their management duties. Moreover, service-level agreements between BITS and its internal customers at the VKG (e.g., stipulating the time frame in which staff had to complete dealing with a ticket) were not up to date because recent technological developments had not yet been incorporated satisfactorily. What is more, in the absence of adequate performance metrics, the BITS managers relied exclusively on the internal service-level agreements as performance metrics. All of these factors led to inefficiency, low profitability, and contributed to low employee satisfaction.

The four BITS departments applied the Top 3 approach to tackle the challenges we describe above and to contribute to the overarching Top 3 goals. Figure 8 shows the aggregated results of the four departments. As a result of Top 3 project, employee satisfaction increased significantly and even above the target level. The



Fig. 8 Top 3 goal achievement in the BITS division (Source: Based on internal data and documents)

goals for efficiency were measured by reduction of full-time employees. Although BITS did not achieve the set Top 3 goals during the Wave, it did make some progress, which served as the basis for further improvement. The increase in profitability also fell short of the target. Nevertheless, improving various processes and reducing time wastage did save BITS 70,000 euro per annum, so, in terms of profitability, there was some progress as a result of the Wave.

In the *Diagnosis Phase*, the Navigators analyzed how staff handled incoming tickets, which is how BITS creates value for its customers. They also monitored various processes and interviewed staff as part of *Value Stream Mapping*. The team used a *Waterfall Diagram* to arrange the processes into a logical order and identify which step in a particular process staff would need to complete before moving on to the next step. They also used a so-called *Heatmap* to visualize their analysis and identify problems in capacity. The *Heatmap* revealed that most tickets were opened in the morning and that the early part of the week is the busiest time for staff. To track and control the progress of Top 3, all four BITS departments surveyed both employee satisfaction and customer satisfaction in the *Diagnosis Phase* to determine the start values (*0-Measurement*).

The results of the *Diagnosis Phase* highlighted the processes that would have to be improved in the subsequent *Design* and *Implementation Phases*. During several *Brainstorming* workshops, staff tried to identify the potential causes of the problems BITS commonly faced and concluded that the executives should focus more on their managerial duties, instead of providing operational expertise. Through these meetings, the participants were also able to define a *Vision* and a *Mission* for each department. Specifically, they concluded that they would have to balance better the capabilities of BITS with customer expectations. To measure the progress of the project, the Navigators and staff first defined the *Ambition Levels* for each of the four Top 3 objectives before defining and implementing concrete improvements.

The BITS staff streamlined and standardized its processes according to the Flow Principle. As a result, they eliminated media disruptions in key processes, reduced the number of tools IT staff used, automated several tasks (e.g., routing jobs) and clarified their scope. Following the idea of *Poka Yoke*, BITS staff introduced a more structured ticketing system with only a few basic mandatory input fields with pre-defined dropdown menus. The new design improved the quality of the tickets and reduced the time staff wasted on collecting all required information to process a ticket. These Lean measures enabled staff to reduce the number of unproductive hours and at the same time boost the speed and quality of the BITS service, which in turn increased both employee satisfaction and customer satisfaction.

To reduce the executives' operational workload and free time for their managerial duties, daily *Performance Dialogs* were introduced in all departments. These dialogs provided a platform on which staff could exchange views on lessons learned and share best practices directly, without the need for managers to mediate. Furthermore, the surveys that continuously track KPIs indicate that this permanent departmental training also increased cooperation and employee satisfaction. Executives now use some of the freed time to provide every member of their staff with regular feedback, which appears to boost job satisfaction. After the Wave, *Performance*

*Dialogs* continued to take place two or three times a week; daily dialogs were no longer considered necessary.

The BITS division also optimized its capacity planning on the basis of the *Heat-map* analysis. As a result, more employees are now available in the morning than in the afternoon, incoming tickets are prioritized according to urgency and non-urgent problems are given lower priority. This change has enabled staff to balance their workload more evenly throughout their working day. Updating service-level agreements with internal customers also improved capacity planning: in the updated documents, the quality and objectives of different services are described in more detail, which has helped adjust more precisely the scheduling of the handling time allocated to each service.

The customer surveys in the *Diagnosis Phase* revealed that solving customer problems quickly is crucial for improving their perception of service quality. Ideally, an issue should be resolved on first contact with a customer or, if this is not possible, at least on second contact. Consequently, BITS staff now increasingly call customers, arrange on-site visits and expand the use of a newly introduced internal chat program to conclude the issue at hand in a single session, rather than exchanging e-mails over several days. They have also introduced a permanent survey to track customer demands and satisfaction continuously. The new KPIs that BITS defines are based on the results of the survey. Following the principle of the technique “*Close the Loop*”, negative feedback prompts the employee responsible for a case to act swiftly and resolve it.

### 5.3 Lessons learned from the implementation of Top 3 project

The VKG’s Top 3 project is a success story. Several goals have already been achieved and, as further improvements are to be expected, it is likely that the company will achieve 100% of its goals in the near future. The continuous evaluations in individual departments and the KUBUS study results we obtained after the Top 3 project had been launched also indicate that the initial goals of the various Waves have been accomplished. What is more, many departments have even exceeded expectations, which demonstrates that the manpower the VKG allocated to the Top 3 project was indeed adequate. For example, with the support of one Junior and one Senior Navigator per department, the Top 3 project occupied the ROH and BITS department heads two to three days a week during the 12 weeks of the respective Waves, while each member of staff only had to invest 2 h per week in the project.

Short-term efficiency gains do not automatically imply that good results will be sustained in the long run. At the VKG, the question of sustaining what was achieved during a Wave did arise in the course of the Top 3 project. To sustain those achievements in every dimension of the project, the company has taken several measures and, so far, these measures seem to be successful. The tools of Top 3 approach have enabled the VKG to overcome the obstacles that typically make it hard to sustain efficiency gains. Overall, the Top 3 project has succeeded where numerous similar projects have failed and can therefore serve as an inspiring

example (Bhasin and Burcher 2006; Kumar et al. 2008a, b; Martínez-Jurado and Moyano-Fuentes 2014). The project's success is noteworthy, particularly because the Top 3 approach was applied across the organization and was adapted to the very different needs of the various departments, as the examples of ROH and BITS show. We are therefore confident that this approach can be successfully applied widely in the service sector. To enable companies in this sector to benefit from applying an LSS approach to the same extent as the VKG, we would like to share some of the most important "lessons learned" during the project. Our observations build on and extend research on the factors that are critical to success when using Lean, Six Sigma, and Lean Six Sigma (Albliwi et al. 2014).

In the literature, providing appropriate training to employees is often highlighted as a factor that is critical to company success (Goh 2000; Coronado and Antony 2002; Chakravorty 2009), so it is hardly surprising that the VKG invested considerable resources in training its staff. As we have already mentioned, the appointed Navigators trained the staff of every department that went through a Wave. The Navigators had already gone through comprehensive, certified training in project management and in the methods of Lean and Six Sigma before training others to apply the principles and tools of the Top 3 approach. The VKG used an international consultancy to train the first team of in-house Navigators and included both consultants and VKG staff in those first teams. This approach enabled staff to gain hands-on experience before going on to direct a wave without the support of external consultants. Despite the significant costs of creating an internal improvement-specialist pool, the VKG's decision to do so seems to have paid off. Staff could relate more easily to the internal Navigators than to the external consultants. This helped create an atmosphere of trust that was conducive to achieving successful solutions and results. In the case of the ROH department, we observed that staff accepted more readily suggestions made by colleagues, rather than by Navigators. For that reason, in the first *Performance Dialogs*, the Navigators retreated to the sidelines to give staff sufficient room to express concerns and suggestions. It is also worth mentioning that the VKG's Navigator program has opened up interesting possibilities for internal career progress and contributes to employee retention.

Overall, the Navigator program proved very successful. Nevertheless, in the course of the Top 3 project, it needed a few adjustments. For example, in the case of the highly specialized ROH department, attempting to use various LSS tools "out of the box" hampered progress at the beginning of the Wave and led to dissatisfaction among the department's staff. However, as the Wave progressed, the Navigators got to know the department much better and adapted those tools to its specific capabilities and needs. This was key to transforming the ROH department successfully. Two factors proved crucial to helping the Navigators adjust the tools they implemented to the needs of the department: first, holding regular meetings with the ROH's executives. In fact, the open atmosphere of those meetings at ROH proved so productive, that the participants suggested that this feature should become integrated into future Waves, as indeed it did. Second, combining the Navigators' methodological training and the executives' familiarity with the staff and their detailed knowledge of how the department operates. All in all, the ROH Wave made clear that even the

best-prepared Navigators cannot expect that in the space of a few weeks they will become as familiar with a department as the people who have worked there for a while. Now, to facilitate the project, Navigator teams spend more time on familiarizing themselves with a department's peculiarities before launching a Wave.

Another factor that researchers regard as critical to the successful implementation of Lean Six Sigma is a committed top management that leads by example to convince the entire organization that change is feasible (Henderson and Evans 2000; Delgado et al. 2010; Laureani et al. 2010). Harald S. Fanderl, senior partner at McKinsey & Company and expert in TOP 3 methodology summarizes: "In short: the kind of transformations that projects such as Top 3 can achieve are much more likely to be successful if the top management demonstrates clear commitment at the outset. The VKG stands out because it succeeded in pursuing and achieving goals that are often considered incompatible: it managed to improve dramatically customer satisfaction, which is now above the average score in the insurance market, and simultaneously reduce cost and improve employee satisfaction. The VKG's effort is manifest in the over 30 Waves that have taken place since the beginning of Top 3. It goes without saying that being open to change and introducing significant changes in the company's leadership are the backbone of this success". At VKG the CEO sponsored the Top 3 project, sending a strong signal to everyone in the company that the project had top priority. Additionally, in the spirit of Lean, the VKG shortened a number of managerial processes and decision paths; for example, by inviting executives and staff to discuss jointly changes to the organization's structure. This ensured that everyone, including executives, would need to adapt to such changes. However, for the success of projects such as the Top 3, commitment is necessary also on lower hierarchical levels. At the VKG's BITS division, for example, some managers who failed to show commitment to the Top 3 project and were unwilling to change had to be replaced. Some of the longest-serving employees also resisted such changes. Negative attitudes to the Top 3 project were more prevalent at the four BITS departments compared to other departments at the VKG. One possible reason for this is that the BITS division, as part of the VKBit subsidiary, is more removed from the problems and needs of the insurance business, both contextually and organizationally. To address the difficulties that arose at BITS, executives who were committed to Top 3 project scheduled a series of workshops to discuss the project openly with the department's employees and to inform them about what it involved. This measure raised the approval of Top 3 project amongst BITS staff and, a year after each BITS department had completed its Wave, the improvements that resulted from the project were acknowledged universally throughout the division.

Similarly, the Wave at the ROH department showed that transparency, informing staff about which processes have to be modified and how and updating staff on the project's progress are critical to its success. People become quickly frustrated by lack of information and misunderstandings and lose their motivation to see a project through to its completion. At ROH, staff reacted in precisely this way when the Navigators neglected to inform them that an employee-reward program that had been announced as part of the Wave would be postponed. It is quite likely that if staff had been informed about the technical requirements of implementing the program and



about the fact that the VKG had little control over when it would be implemented, they would have shown understanding.

A further factor that is crucial to the success of projects such as Top 3 is choosing carefully when they should be implemented in which departments and in which order (Henderson and Evans 2000; Antony 2006; Pepper and Spedding 2010). Starting with departments that were either relatively small or relatively free of conflicts proved to be the right way forward at the VKG. The team that planned the Top 3's Waves thought very carefully about whether a Wave should take place simultaneously or successively in similar departments, on the basis of criteria such as Navigator capacity, the need to keep business operations going and potential gains in efficiency. The experience of conducting the Waves simultaneously in the four BITS departments shows that despite the similarities, no cost-reducing synergies arose from this exercise.

Spelling out the goals of the department at the beginning of each Wave so that everyone involved is clear about them is also important. From our perspective, visualizing these goals concisely (see Figs. 6 and 8) helps every employee focus on the required improvements. Tracking progress, as well as mistakes, continuously and discussing them openly during regular *Performance Dialogs* helps provide timely feedback to staff, executives and Navigators. Also, employees tend to accept such projects more readily when their success is measured by comparing the target values and the values that are actually achieved (Delgado et al. 2010). To that end, the VKG introduced a so-called transparency cockpit to track the success of every single Wave and to assess the overall impact of the Top 3 project.

In the case of the VKG, increasing profitability—one of the four goals of the Top 3 project—was the target that employees feared the most, because of the perception that this goal can only be achieved by cutting jobs. However, the VKG re-invested around two thirds of the savings a department achieved in that department—for example, to improve working conditions or develop new products. This approach gave staff an incentive to improve bottom-line results. A further incentive was ensuring that the company would not increase the staff's workload in response to freed time, but would use this time to allow staff to focus on customer support, get specialized training on handling non-routine, challenging tasks and deliver tasks that had previously required external support.

The degree to which individual departments sustain the positive results of the Top 3 project after the Navigators have gone is reflected in the extent to which staff have integrated the various tools and ideas of LSS into their everyday work. In practice, not all departments continue to use these tools and ideas to the same extent. For example, the *Performance Dialog* has been established in all departments as a platform on which staff can share insights and discuss various issues with executives. Similarly, the *Skill Matrix* is widely used to assess staff and develop their skills. In contrast, whereas ROH employees now try to handle most problems internally and instantly, there is still scope for improvement in this regard at the BITS departments. This difference may arise because technical and financial constraints make it harder for BITS staff to adopt that approach, whereas ROH staff work closely with customers and are able to improve problematic aspects of their work quickly, which boosts their motivation.

## 6 Implications

The purpose of our concluding remarks is twofold. First, we want to highlight how strategic positioning can affect the design and implementation of large-scale projects that impact significantly an organization. Second, we want to demonstrate how tools and ideas borrowed from Lean and Six Sigma can be combined to achieve specific goals in the context of such projects.

From our analysis of how the VKG designed and implemented the Top 3 project, we can conclude that in the insurance industry, such ambitious projects are doomed to fail, if companies attempt to apply Lean and Six Sigma methods and ideas without adapting them to their specific needs and without taking into account their market position and strategy. While reducing costs and increasing profitability are important goals, pursuing these goals blindly can be detrimental to the quality of the services and products a company provides. In the car industry, for example, certain well-known companies suffered greatly from dissatisfied customers in the 1990s because of poor quality. In the insurance industry, the knock-on effects of customer dissatisfaction are felt much more quickly than in the manufacturing sector. If a company's strategic position depends to a large extent on being able to charge comparably high prices—e.g., because of its comprehensive offerings and corresponding cost structure—it is of utmost importance to provide high-quality service and fully satisfy customers so that they are willing to pay a premium. At the same time, such companies have to emphasize profitability and analyze their cost structures in order to design their processes more efficiently. The insurance company of our case study falls in this category and the effort to cut costs and increase profitability while defending and maintaining its market position as a provider of high-quality services and products is difficult. The findings of this paper show how this difficult task can nonetheless be achieved. Merely focusing on efficiency and cutting costs is not enough. Companies in the service sector need to prioritize also customer satisfaction and to adopt a more holistic approach to change in order to strengthen their market position.

We have demonstrated that it makes sense for companies with a similar strategic positioning and in similar situations to combine ideas from Lean and Six Sigma in order to increase efficiency and simultaneously ensure that their output is of high quality. Our case study of the VKG illustrates that all members of an organization need to embrace and participate actively in projects such as Top 3 to achieve the set goals. It is important that everyone in a company understands that the changes such projects introduce will be permanent. Projects such as Top 3 aim to change *how* a company's members approach and deliver their tasks, while maintaining the company's core values, business model, strategy, goals and value proposition—all that makes its business model unique.

Our case study of the VKG has also shown how ideas borrowed from Lean and Six Sigma can be combined. Both methodologies are process-focused; i.e., they do not focus on the company's ends, but on improving the means through which those ends can be achieved. Moreover, both can be adapted to a company's ends, at least to some extent, which offers those in charge of designing and running an LSS project some flexibility. Before an LSS project is launched, it is important to define precisely the company's goals and how they are interrelated in the sense of potential cause-and-effect relationships. In our case, the LSS framework we designed helped

raise employee satisfaction and has therefore helped the VKG reach all four goals of the Top 3 project, while maintaining its distinctive organization and business model.

Some of the insights we gained from our study may well be useful to service companies in other industries. In the literature, the generally recognized key characteristics of services are intangibility, inseparability, perishability, variability and lack of ownership (Gronroos 1978; Parasuraman et al. 1988; Vargo and Lusch 2004). One consequence of these characteristics is that in the service sector, and therefore also in the insurance industry, production follows an inherent “pull” principle, services are often customized (which results in a diverse, frequently changing product portfolio and short product life-cycles), overhead costs are significant and processes require intensive employee activity, which limits the potential for automatization and standardization. This means that in order to design successfully an integrated LSS approach for an entire company, it is necessary to follow certain guidelines. First, companies that engage in projects such as Top 3 need to have in place a general framework that allows them to implement the principles and tools of Lean and Six Sigma in every department. They will also need to adapt these tools to the characteristics of the industry, of the company and even of individual departments. Second, companies need to make use of Six Sigma’s DMAIC cycle, which has proven to be a solid framework for integrating Lean and Six Sigma tools. Third, each department within a company will have to both standardize and customize the broader framework: the one-size-fits-all approach does not work with large-scale LSS projects. For example, it is conceivable that some departments may benefit more from Lean while others may benefit more from Six Sigma, depending on their goals, cultures and attitudes to change.

In sum, our findings show that despite the many obstacles large firms have to overcome in order to achieve modernization and stay competitive, it is possible for them to adapt without weakening their core strengths. However, as our case study illustrates, there is no out-of-the-box way of tackling the challenges that this effort inevitably poses. Every company needs to analyze carefully its situation before it can start thinking about which ideas and tools from which approaches it can usefully combine in order to achieve its goals and stay ahead of the competition.

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**Role of Authors** The Top 3 project was carried out at the Versicherungskammer Bayern Group (VKG) and developed jointly by initiators, employees, consultants and the project board. More specifically, the Top 3 project was initiated, supervised and sponsored directly by the Group CEO of the VKG, Dr. Frank Walthes, who is also a co-author of this publication. Marleen Tellermann is his executive assistant and the department head of organizational development that is specifically responsible for corporate processes. Prof. Kai Sandner was during the project senior expert of the VKG. Sebastian Sieber is his research assistant and has no affiliation with the VKG. Sebastian Sieber and Kai Sandner were never directly employed for the purposes of the project, but helped develop the conceptual background and underpinned the project with scientific literature and methods. The implementation of Top 3 project at VKG was conducted jointly with a professional consulting firm.