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Quality Quandaries: Increasing the First Time Fix Rate in a Customer Contact Center

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INTRODUCTION

In The Netherlands, the financial system is coping with increasing international competition. It is therefore becoming increasingly important for such organizations to reduce operational costs and achieve a higher customer satisfaction (Blom and Kuenen 2009). As a consequence, the last decade has seen numerous financial services organizations embrace a range of methods for improving business processes.

A widely applied method for improving operational efficiency and effectiveness is Lean Six Sigma. Lean Six Sigma deals with eliminating operational inefficiency on a project-by-project basis, by taking each project through define–measure–analyze–improve–control (DMAIC) phases (De Mast et al. 2012). Though the method has its origins in manufacturing, it is also used in service organizations as well. Some literature discusses Lean Six Sigma in call centers (McAdam et al. 2009; Laureani, Antony, and Douglas 2010; Piercy and Rich 2009), which is also the setting of this article.

This column discusses a Lean Six Sigma improvement project in the contact center of a medium-sized bank (€7.5 billion in annual turnover and €170 billion in assets under management; ABN AMRO Group 2013). The goal of the project was to increase the first-time fix rate for the customer contact service center. We first provide a brief background on the case study. Next, we describe how the project has been executed following the five DMAIC phases. Finally, we conclude by discussing the benefits of this particular Lean Six Sigma project.

CASE STUDY

ABN AMRO bank is one of the three largest banks in The Netherlands, serving retail, private, and commercial banking clients, and is active internationally in a number of specialist activities. In 2013 the bank had around 7 million clients and more than 22,000 employees.

In 2010 the bank started with Customer Excellence, a company-wide improvement program that entails a way of working that combines customer focus and operational excellence. In the scope of this program some employees are trained in the Lean Six Sigma methodology, so-called Green Belts and Black Belts, who execute improvement projects.

One of the five strategic priorities for ABN AMRO bank is to enhance client centricity. For the call center and back offices of ABN AMRO this implies that

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accessibility and service fulfillment are focal points. Reducing the number of employees that a customer has to meet in order to fulfill a service request is a priority for the bank. Being able to service customers in time, efficiently, and to utmost customer contentment is requiring fundamental changes in the way processes, responsibilities, and employees are organized and trained. Therefore, a wider organizational will to improve employee skills and responsibilities has emerged parallel to the deployment of the Customer Excellence program, which is labeled under the notion of moving towards advice and service. In 2014, an organizational change of the contact center and a release of a new version of the interface of the Internet banking service led to an increase in demand for the support of Internet and mobile banking services for retail customers. Therefore, a Lean Six Sigma project was initiated to improve the accessibility and service fulfillment of the contact center.

Define

In the define phase, the project leader described the process to be improved and formulated the project objectives and their potential benefits. The process concerns handling incoming client calls. At a high level, the call handling process is organized in the following steps: first, a client calls and an employee answers this call and inquires into the reason of the call. Next, if the employee does not know the answer, he consults a second-tier colleague. Finally, the client's question or request is answered and the call is wrapped up. This is schematically shown in Figure 1.

On a more detailed level, the process was described step-by-step in a flowchart as displayed in Figure 2. The process steps are as follows: a client calls and this call is answered by an employee of the first tier, who inquires into the reason of the call. If the employee cannot answers the client's question, an employee of the second tier is consulted. The second-tier employee either answers the questions or puts the question through to functional maintenance. This last part was set out-of-scope for this project, because it concerned only 1.7 percent of all daily calls.

The project objective is to increase the first-time fix rate (FTFR). The FTFR equals the percentage of calls the center's employees can answer directly without consulting a colleague. The scope of the project was all calls concerning Internet and mobile banking service for retail customers. The target of the project was to reduce personnel costs. This can be achieved by shortening the total handling time of calls and decreasing the number of consults (i.e., increasing the FTFR). A reduction in the total handling time of a call will result in a decrease in the number of full-time equivalent (FTE) first-tiers necessary. Furthermore, a decrease in the number of consults will result in a decrease in the number of FTE second-tiers necessary. Note that the total number of FTEs needed in this process equals

$$FTEs = \#\ calls * THT + \#\ consults * TCT, \quad [1]$$

where # calls denotes the total number of calls answered by the first tier, # consults denotes the number of consults with the second tier, THT stand for first-tier total handling time, and TCT stands for total consult time of the second tier. The THT is defined as the sum of the time an employee speaks to a client, the time needed for consulting the second tier, and the wrap-up time.

The department (business line) of the contact center that handles calls concerning Internet and mobile banking service for retail customers had a total of 425 FTE first-tiers working when the project started. The scope of the project was all calls concerning the Internet and mobile banking service. These calls take up 25 percent of the daily work of the first tier employees. Furthermore, ten FTE second tiers worked full time in scope of this project. The target of the project was to eliminate the need for the second tier.

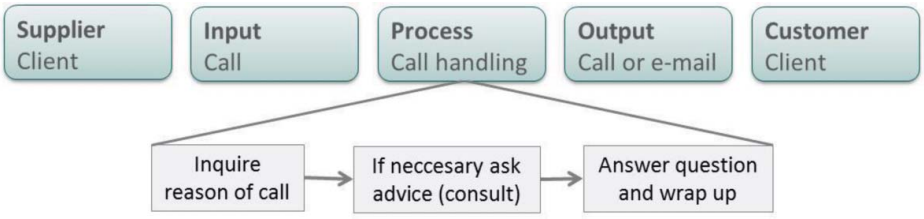

FIGURE 1 Macro process description of the process of handling calls.

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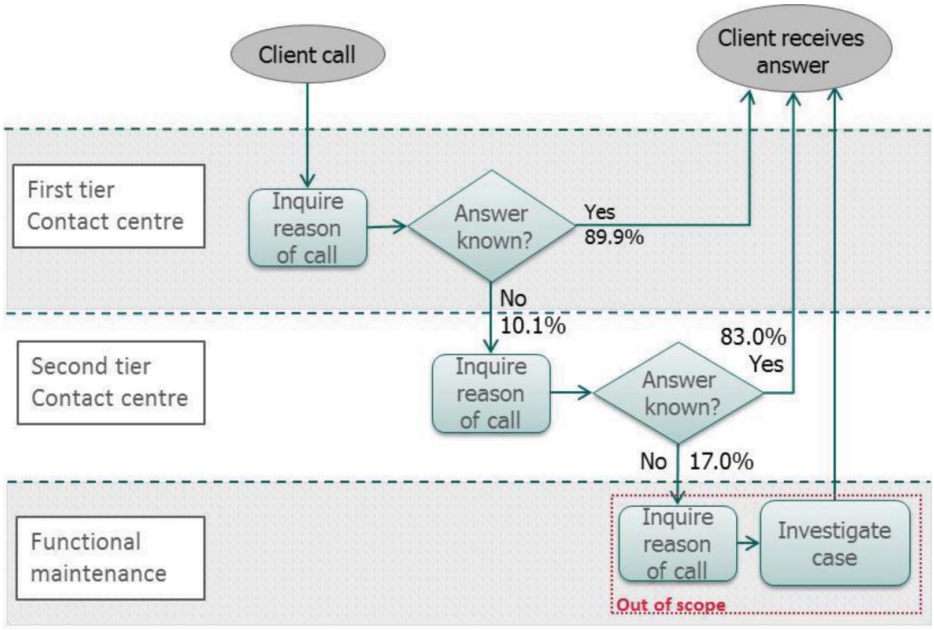

FIGURE 2 **Micro process description of the process of handling calls.**

The project team consisted of three advisors, one of whom is a Green Belt (i.e., project leader). They report to a champion, who has given them the assignment to do the project and is manager of the business line.

Measure

The first step in the measure phase includes the selection of clearly defined, measurable characteristics, which are called "critical to quality characteristics" (CTQs). Then, a procedure is established to measure these characteristics, and the measurement procedure is validated.

The project objectives were to increase accessibility of the center by increasing the FTFR and by reducing the total handling time. These objectives translate into the objective to reduce the headcount in the first tier and second tier, respectively. The relationship between project objectives and strategic focal points can be schematically illustrated by means of a CTQ flowdown (cf. De Koning and De Mast 2007). Furthermore, Lokkerbol et al. (2012) distinguish eight generic CTQ flowdowns for the financial service organizations. The CTQ flowdown selected in this project is a modified version of the generic template for projects with the objective to reduce cost by increasing efficiency of human resources. The CTQs are equal to the four components of Eq. [1]: the number of calls, the total handling time, the number of consults, and the total consult time. The CTQ flowdown for this project is given in Figure 3.

For all CTQs we need operational definitions. The total handling time is measured per call and was obtained by listening to records of calls. The handling time should be as low as possible and the center's target equals 360 seconds. The number of calls and consults are measured per day and data were obtained from the contact center's computer system. The target for the FTFR equals 95 percent, whereby

$$FTFR = \left(1 - \frac{\#consults}{\#calls}\right) * 100\%.$$

To validate the measurement procedure, two of the team members listened to the same three calls and measured the THT. Consequently, the definition for start of a call was adjusted and agreed upon. Furthermore, it was not always clear whether a consult took place; therefore, this was manually checked with the respective employees of the first tier. The number of calls and consults was measured for thirty consecutive days in a representative period.

Analyze

In the analyze phase, the current performance of the CTQs is determined based on the collected data. A thorough analysis leads to a diagnosis of the problem

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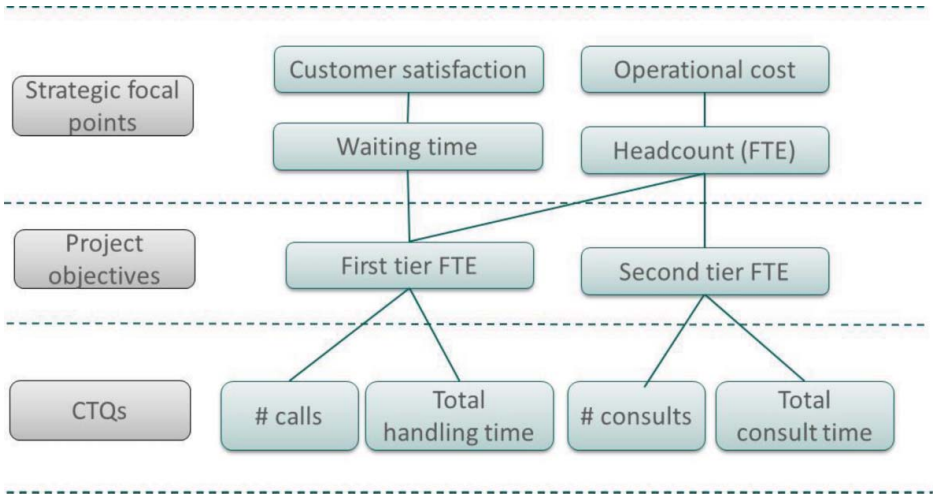

FIGURE 3 CTQ flowdown of the project.

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and a list of potential influencing factors. Last, a recalculation of the project benefits was made.

The Green Belt first analyzed the CTQs with the use of descriptive statistics. The average number of calls per day equaled 1,345 and the average number of consults per day equaled 136. Therefore, the FTFR equaled 89.9 percent (see Table 1).

Next the Green Belt analyzed the THT of the calls. Seven calls were measured for eight employees each. The overall average THT equaled 280 seconds. Furthermore, it was discovered that there was a large variation in the total handling time between the employees (Figure 4). It was known that due to a reorganization, only employees 6 through 8 had training for Internet banking service-related calls, probably causing a shorter average THT: 172 seconds as opposed to 345 seconds. In the total population of 425 FTEs, 22 percent of the FTEs have had this specific training. Therefore, based on a weighted average, the average total handling time is 307 per call. Second tier consult time (TCT) equaled 352 seconds on average.

The analysis of the number of calls and consults showed that on average 89.9 percent of calls are handled by the first tier; thus, the target FTFR of 95 percent is not met on average. In the sample there was only one day with an FTFR above 95 percent (see Figure 5). Analysis showed that on average the target will be met for only 1.5 percent of the days.

Furthermore, the Green Belt identified other influencing factors for the CTQs using Ishikawa diagrams, brainstorming sessions, autopsies, and a value stream map analysis.

Based on these analyses, the potential benefits of the project were recalculated. The average number of calls per day equals 1,345. Because this was not the focus of this project, this CTQ was set as out-of-scope. In addition, the second tier consulting time was set out-of-scope because reducing the number of second-tier calls is more relevant than decreasing the second-tier consulting time. The new objectives were determined to be that the FTFR would increase from 89.9 percent to 95 percent, which would imply a halving of the second-tier workload and thus a reduction five FTEs.

Improve

In the improve phase, the Green Belt selected the most important and changeable influencing factors and provided evidence of their effects on the CTQs.

TABLE 1 Overview of Performance

CTQs	# Calls per day	THT (seconds)	# Consults per day	TCT (seconds)	FTFR (%)
Company target	N/A	360	N/A	360	95.0
Measured performance	1345	307	136	352	89.9
Objective	Out of scope		0	Out of scope	100

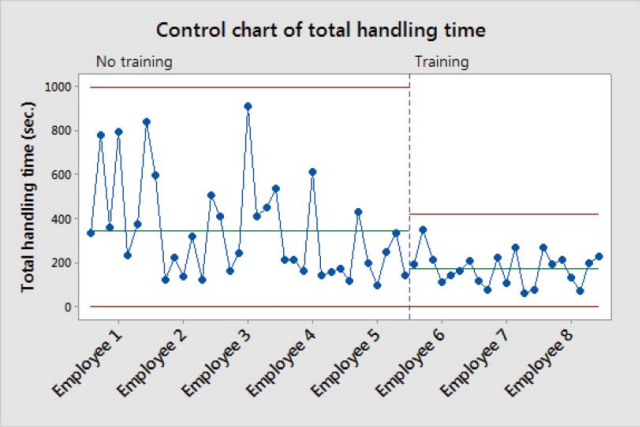

FIGURE 4 **Control chart of total handling times per employee.**

Based on these influencing factors, the Green Belt designed improvement actions that would result in a large improvement of the CTQs.

To further understand the differences in total handling time between employees (see Figure 4), the following characteristics, which were set in a brainstorming session and by listening to several calls, were studied: training, private use of Internet and mobile banking, and when an inquiry is aimed. In the measure phase, seven calls were measured for each employee. From this, the average total handling time was computed. These averages were analyzed with a Kruskal-Wallis test to identify significant influencing factors (Table 2). If an employee had been trained or used aimed inquiry, the total handling time was significantly shorter (173 and 277 seconds, respectively). Probably these two effects are related and dependent. Furthermore, it was found that the private use of mobile banking by the

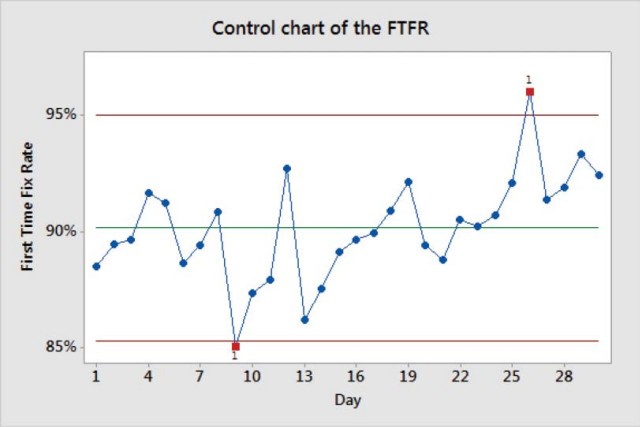

FIGURE 5 **Control chart of the FTFR.**

employees had no significant impact on the THT. This result was a surprise: both the employees and management supposed that private use of the Internet and mobile banking of ABN-AMRO would make it easier to answer client calls due to first-hand experience.

Next, the most important factors influencing the number of consults were investigated. For this the number of calls to the second tier by the eight employees was measured. This varied from zero to four calls in the seven calls measured for each employee. None of the measured employee characteristics had a significant effect on the number of calls to the second tier (Table 2).

To identify more influencing factors, the employees were included in brainstorming sessions and in making an Ishikawa diagram. The contact center employees were enthusiastic about the ability to address the everyday challenges they meet. Involving them in identifying influencing factors and developing improvement actions did not just give them the opportunity to do so, it also made sure there was enough support among the employees to implement the designed improvement actions.

It was concluded that the most important factors influencing the number of consults were training and no access to the database with specific instructions. Furthermore, skills influence the number of consults. Another discovery was that some calls for which the second tier was consulted were calls concerning online investment services. Most of these belonged to the investment business line instead of the Internet banking business line.

Several improvement actions were designed to decrease the number of consults. The largest influencing factor was the inability to access the database with specific instructions for first-tier employees. The Green Belt investigated whether it was possible to make this database accessible to first-tier employees. This was possible and steps have been taken to obtain the corresponding approval.

Furthermore, to solve the problem of calls bouncing between the investment and Internet banking business lines, the Green Belt designed a decision tree in cooperation with the investment service business lines. This tree shows which client calls should be handled by Internet and mobile banking and which should be handled by investment services. The tree, as displayed in Figure 6, is now used by both business lines. This tree

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TABLE 2 Effects of Potential Influence Factors on First-Tier Total Handling Time

		Handling time (seconds)			No. of consults		
Influencing factor	No. employees	Average	SD	*p* Value*	Average	SD	*p* Value*
Level of training							
High	3	172	34	0.025	0.67	0.058	0.655
Low	5	345	136		1.40	1.30	
Aimed inquiry							
Yes	6	211	53	0.046	0.83	0.75	0.739
No	2	488	60		2.00	2.12	
Use mobile banking							
Yes	5	257	157	0.297	1.20	1.23	0.881
No	3	319	115		1.00	1.00	

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prevents approximately two percentage points of the consults per day (see Figure 7).

To decrease both the number of consults as well as the THT, a learning cycle together with a coaching trajectory was developed for all employees who did not obtain training before. Furthermore, an inquiry tool was developed to ensure aimed inquiry, which ensured a decrease in the THT.

With these improvement actions, all reasons to call the second tier were eliminated (Figure 7) because first-tier employees can solve nearly all questions independent of second-tier employees. In any other case, the question has to be routed to the functional maintenance or investment service employees. Consequently, in the redesigned process, the second tier is omitted (Figure 8).

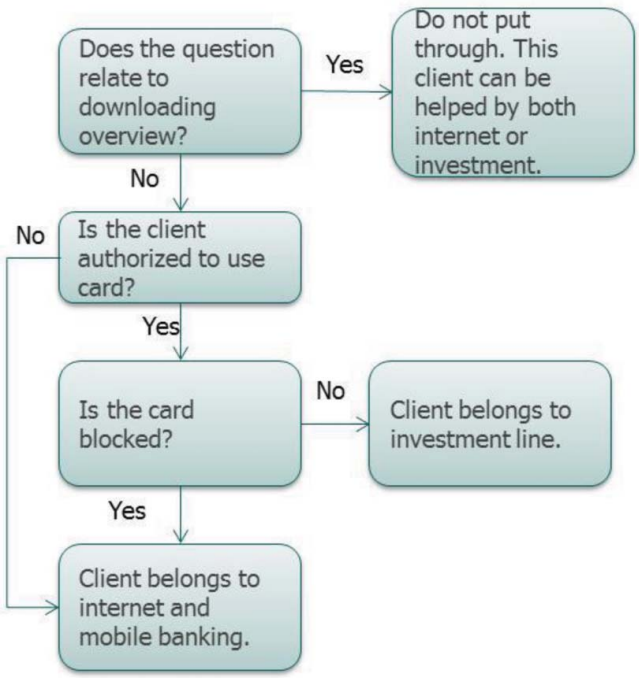

FIGURE 6 Decision tree to route calls.

Control

The improve phase resulted in improvement actions that aim to change the processes for the better. In the control phase the Green Belt created a control plan to deal with irregularities in the process, organized continuous improvement, and assigned roles and responsibilities. Furthermore, the benefits of the projects are calculated and, finally, the project is closed.

Due to the organizational structure and the time needed to implement the more complex improvement actions, it is not possible to immediately implement the new process without a second tier.

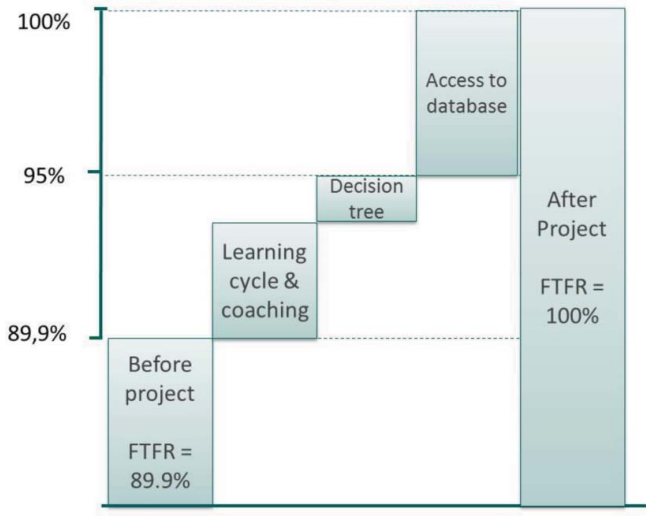

FIGURE 7 Overview of the effects of the improvement actions on the FTFR.

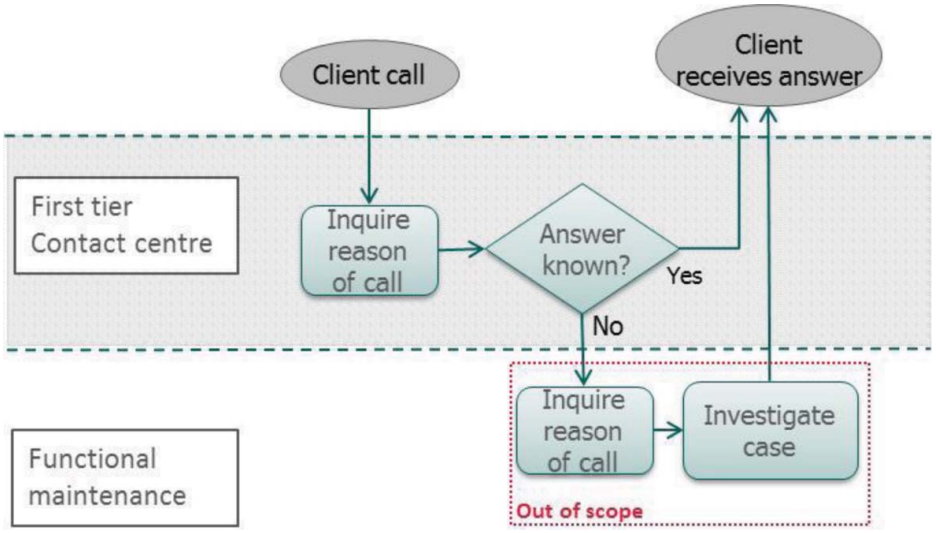

FIGURE 8 **Micro process description of the redesigned process.**

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Furthermore, the education program is still being developed, so there are still questions for the second tier. The new process is planned to be implemented within a year; until that time, some second-tier employees are still available for calls. To ensure that the number of calls to the second tier does not increase, a process control loop is set up by the Green Belt. Furthermore, the Green Belt designed a process control loop to monitor the total handling time.

CONCLUSION

This study demonstrates how Lean Six Sigma can help to increase the FTFR in a contact center. It illustrates how the DMAIC roadmap helps in providing focus and structure to an improvement project. More important, the added value of the DMAIC approach in realizing strategic ambitions is illustrated. In this project, the organizational will to realize the movement toward advice and service has been successfully operationalized by utilizing the Lean Six Sigma DMAIC approach. Core principles of Lean Six Sigma, such as a data-based diagnosis and evidence-based improvement actions, helped to design improvement actions that have a large impact on the CTQs.

The project improved the operational cost for the contact center, within the scope of calls related to mobile banking. The increase in FTFR from 89.9 percent to 100.0 percent leads to a cost reduction of €225,000 annually. The data-based diagnosis revealed important influencing factors as well as showed that a common truth, that employees who privately bank and have first-hand experience have shorter handling times, was unfounded. Based on an analysis of types of calls, it was identified that many calls were easily circumvented with a decision tree and an inquiry tool. More extensive improvement actions are the development of a learning cycle. Finally, a process control loop helped to secure that the new performance is retained.

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Inez Zwetsloot obtained her master's degree (MPhil) in econometrics from the University of Amsterdam in 2013. Currently, she works for the Institute for Business and Industrial Statistics as a Lean Six Sigma Consultant and is a Ph.D. student at the University of Amsterdam. Her current research interests include robust exponentially weighted moving average charts.

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