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Business Process Improvement using Lean Six Sigma: An Example of Improving the Onboarding Process

Prenova poslovnih procesov s pomočjo *Lean Six Sigma:* Primer prenove *onboarding* procesa

Diplomsko delo

Ljubljana, 2016

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In the thesis we show and analyse how the *Lean Six Sigma* approach is used in services. Since this methodology was originally used in manufacturing environments, even today it retains a hint of the methodology used for manufacturing process improvements. In performing the empirical part of this thesis, an answer is given to the research question of whether Lean Six Sigma is also an appropriate tool for use in services. First, we outline the theoretical basis about Lean Six Sigma. Further on, we demonstrate how the Lean Six Sigma methods and tools are used by considering an example of improving the onboarding process in Company A.

In both theoretical and empirical parts, the structure of the thesis follows the DMAIC (Define-Measure-Analyse-Improve-Control) project approach used by Lean Six Sigma. In each DMAIC phase, we present some Lean Six Sigma tools to demonstrate Lean Six Sigma's usefulness in services. Our key finding is that the Lean Six Sigma method offers appropriate tools for business process improvements also in the area of services.

In the conclusion, we sum up the main findings, mention the limitations of the method and list some recommendations for Company A's future considerations about its onboarding process. Our primary suggestion for Company A is to consider the changing needs of newcomers arising from demographic changes and to use technology to facilitate onboarding.

Key words: Lean Six Sigma, onboarding, business process improvement.

Prenova poslovnih procesov s pomočjo *Lean Six Sigma:* Primer prenove *onboarding* procesa

V diplomskem delu prikazujemo in analiziramo uporabo *Lean Six Sigma* pristopa na področju storitev. Prvotno je bila uporaba te metodologije znana le v proizvodnih okoljih, zato se je vse do danes ohranil sloves tega pristopa, kot primernega le za proizvodna okolja. Z izvedbo empiričnega dela te diplomske naloge želimo odgovoriti na zastavljeno raziskovalno vprašanje: Ali je pristop *Lean Six Sigma* primeren za uporabo tudi na področju storitev? V začetku orišemo teoretske temelje pristopa, nadalje pa prikazujemo uporabo *Lean Six Sigma* metodologije in orodij na primeru prenove *onboarding* procesa v podjetju A.

Struktura obeh delov, teoretičnega in praktičnega, sledi DMAIC (Definiraj, Izmeri, Analiziraj, Izboljšaj, Nadziraj – *ang. Control*) modelu, ki se uporablja pri projektih izvedenih s pomočjo *Lean Six Sigma*. Z namenom prikazati uporabnost tega pristopa na področju storitev, v vsaki od faz prikazujemo uporabo izbranih *Lean Six Sigma* orodij. Ugotovili smo, da so orodja, ki jih ponuja Lean Six Sigma, primerna tudi za uporabo tudi na področju storitev.

V zaključku povzemamo glavne ugotovitve, omenimo omejitve pristopa in naštejemo nekaj predlogov v zvezi s prenovo *onboarding* processa v podjetju A. Med drugim podjetju A predlagamo, da upošteva demografske spremembe na trgu dela ter svetujemo uporabo tehnologije za pomoč pri onboarding procesu.

Ključne besede: Lean Six Sigma, onboarding, prenova poslovnega procesa.

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List of abbreviations

BB	Black Belt
CEO	Chief Executive Officer
CFO	Chief Financial Officer
COPQ	Cost of Poor Quality
CQI	Continuous Quality Improvement
CTQ	Critical to Quality
CV	Curriculum Vitae
DMADV	Define-Measure-Analyse-Design-Verify
DMAIC	Define-Measure-Analyse-Improve-Control
DPI	Department Performance Indicator
DPMO	Defects per Million Opportunities
EBIT	Earnings Before Interest and Taxes (also *operating profit*)
EBIT Margin	Earnings Before Interest and Taxes (EBIT) Divided by Total Revenue
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortisation
EBITDA Margin	Earnings Before Interest, Taxes, Depreciation and Amortisation (EBITDA) Divided by Total Revenue
FY	Financial Year
GB	Green Belt
HR	Human Resources
IT	Information Technology
KPI	Key Performance Indicator
MBB	Master Black Belt
MSA	Measurement System Analysis
NI	Net income – profit (also called *"bottom line"*)
PD	Person-days
R&D	Research and Development
ROI	Return on Investment
SIPOC	Suppliers – Inputs – Process – Outputs - Customers
SMART	Specific – Measurable – Achievable – Relevant – Time-Bound
SPC	Statistical Process Control
SWOT	Strengths – Weaknesses – Opportunities – Threats
TQM	Total Quality Management
TTH	Time to Hire
VOC	Voice of Customers
YOY	Year over Year

INTRODUCTION

In today's fast-changing competitive market it is highly important for companies to plan and monitor their effectiveness. In successful companies, critical observation of internal process efficiency and rapid adjustment to market trends is part of daily activities, not only for company executives but each and every employee within their areas of responsibility. New technologies are bringing new possibilities for the delivery of services, they can provide remote service support, while some services can even be completely outsourced to external teams. As the network of services is becoming ever more complex and usually represents quite a high proportion of all personnel-related costs, it is vital that the people involved in these processes work 'smart'.

Especially in companies with a less developed corporate culture there are usually 'black lists' of the processes or functions which are not bringing the required deliveries. In any case, stating that some processes do not work optimally based on assumptions, 'gut feeling' and 'word of the mouth' are not objective arguments and are completely on the contrary to the Lean Six Sigma theory and principles examined in this thesis. Namely, a major requirement of Lean Six Sigma is that every business decision is based on facts and figures.

Lean Six Sigma was first introduced in manufacturing business environments, with a special focus on shorter lead time, less waste, the most optimal material consumption, flexibility and quality and, on the other hand, keeping the accuracy and precision on a high level. The two philosophies within Lean Six Sigma – Lean and Six Sigma – keep customer focus as the most critical factor of the success of a process.

In services "customers" can mean external customers (e.g. in healthcare, banking, government) or internal customers when one service department supports/serves other departments within the company (e.g. internal IT, Finance, HR departments, etc.). The reason that Lean Six Sigma methodologies were also introduced to the area of services is that research studies showed that 50% of total service costs consist of work that adds no value in the customer's eyes (George 2003). Another reason is that services still use insufficient data and process thinking, which is promoted and required when implementing Lean Six Sigma. With a wide range of IT systems in use in services, there are more data

available than a decade or two ago. Although nowadays the data are available on a bigger scale, services functions still lack a willingness and knowledge to analyse the figures.

The main goal of this thesis is to present the Lean Six Sigma methodology in the context of the service business environment and demonstrate its practical use in a real-life example, helping Company A to make the onboarding process more effective and efficient. The structure of this paper follows these two main goals of the thesis. Roughly, we can divide this paper into two main parts:

First part – theoretical part: In the theoretical part we first offer the main definitions about the terms "Lean" and "Six Sigma" separately and in the continuation we offer an explanation of how these two philosophies fuse within "Lean Six Sigma" and what are the joint fundamentals of this unique approach to process improvement.

The remaining structure of the first part follows the Lean Six Sigma DMAIC (Define-Measure-Analyse-Improve-Control) model. Consequently, the second chapter is divided into sub-chapters, with each subchapter outlining one phase of the DMAIC model. At the beginning of each phase we shortly describe the purpose of the phase, the main activities within the scope of a particular phase and which Lean Six Sigma methodology and tools are most commonly used in each phase. For each phase we select a few tools which we explain in greater detail.

The third section of the first, theoretical part provides a definition of the onboarding process. We include this in the theoretical part to offer the reader the basis for better understanding the practical part. The onboarding process is separately addressed in the theoretical part as the understanding of the onboarding process is very diverse and we want readers to be on the same page, helping them to have the same understanding of the "onboarding" definition before shifting to the second, empirical part.

Second part – empirical part: In the empirical part we apply the theoretical findings and knowledge to a practical example. We will improve one of the existing processes which currently does not work well in Company A – the onboarding process that is the (informal) responsibility of the Corporate HR[1] Department in the headquarter office of a multinational

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[1] Human Resources.

company. We will follow the same approach as in the theoretical part. The improvement project will be presented according to the DMAIC phases, starting with the Define and ending with the Control Phase. Each phase will be a separate sub-chapter of Chapter 4.4. In each sub-chapter we will present some tools used to improve the onboarding process in Company A.

In the *Define Phase,* we first make the process mapping, focusing especially on suppliers and customers of the onboarding process in Company A. We outline customer needs and measure customer satisfaction with the current process with the help of the Voice of Customer (VOC) method. We present these customers' needs in a measurable way together with target values in a Critical to Quality (CTQ) table. Using force field analysis, we detect the driving and inhibiting forces – on one hand people, functions or other internal or external stakeholders and factors which may support the improvement project and, on the other hand, the factors which may counter the renewal of the chosen process. At the end of the Define Phase, we present the project charter made for our project.

In the *Measure Phase*, we use the Makigami method to present a process flow, dividing process activities into value adding and non-value adding, with an estimation of the time input needed for each process step. For each process step we define who (person or function) is responsible for its realisation. We list the problems occurring in particular process steps and brainstorm what could be the solutions for those problems. In this phase, we perform very detailed measurements of all activities within the three most time-consuming process steps using Activity Structure Analysis. We calculate the process costs before the process is reworked.

In the *Analyse Phase*, we try to detect waste and propose ways to eliminate it. For bigger problems occurring during the process we try to find causes using an Ishikawa (cause and effect) diagram and a Mind map.

In the *Improve Phase*, we present our plan for picturing the renewed "to be" process flow. In addition, we present the approach for how we will use the 5S within the department in general.

In the *Control Phase*, we forecast how we will keep the process stable and the implemented changes sustainable. We define KPIs which will measure the future process after the implementation.

In the conclusion, we will sum up theoretical findings about Lean Six Sigma as much as we have learned from the literature and existing sources. We will recap major lessons gathered in the course of running the process improvement project. The main benefits and weaknesses of the methodology will be outlined and some aspects of Lean Six Sigma in HR will be challenged to encourage further discussions and research on Lean Six Sigma in services.

With this thesis we promote the idea of making data-driven decisions also in services. Our primary research question is: *Can Lean Six Sigma methods also be used in services? And, if so, how*? Our aim is to prove the statement that Lean Six Sigma is not only applicable for use in manufacturing but is also a great methodology for use in services.

In this thesis we mainly use a descriptive research method. First, we review, analyse, interpret and compare secondary sources. We explore and explain the existing literature while providing additional information about the topic. At the beginning, we introduce our research question and in the first part of the thesis we offer a theoretical background about the topic. While performing the improvement project in the empirical part we confirm our research question (deductive approach).

In the empirical part, we gather the data and describe and explain the findings using visual aids (e.g. tables, graphs, etc.). To collect the data we use observational, survey and interview techniques. In our research we combine quantitative and qualitative elements. We engage in quantitative research using structured interviews (Voice of customers), structured self-observation (Activity structure analysis), process costing, etc. When organising process description workshops (e.g. SIPOC, Makigami), we ask the questions "Why?", "What?" and "How" to obtain a better and deeper understanding of the process. We also organised creativity groups to find innovative solutions to our problems. These are examples of qualitative elements of our research.

1   DEFINITION OF LEAN SIX SIGMA IN SERVICES

When in this paper we mention "services", we refer to service organisations (e.g. healthcare, banking, government, retail, etc.) as well as to service infrastructure or departments, be they in manufacturing companies or in service companies (e.g. marketing, sales, accounting, hiring, production control, engineering, R&D…) (George 2003a).

As practice shows, service departments need to implement Lean and Six Sigma because there are 30%–80% of waste[2] activities performed in services. Service processes are usually slow and expensive. In contrast to what many might think, slow processes are more prone to poor quality (George 2003a). This is a root cause of why services are often criticised – due to too much waste still being present in services they are delivered at too slow pace (Su et al. 2006).

Case studies mentioned by George (2003a) show that 50% of total service costs consist of work that adds no value in the customer's eyes. Customer value can be improved if services are delivered faster and the service is consistent and reliable every time. This is the basis for a better relationship with customers (Antony 2006).

Another reason that services need the Lean and Six Sigma tools is to start process thinking and using data to make decisions based on facts rather than assumptions. Six Sigma employs a concept of statistical thinking and encourages the use of statistical tools to reduce defects (Antony 2006).

Reducing the cost of complexity and interactions within the system by doing away with non-value-adding activities is another important factor of Lean Six Sigma implementation (Pepper and Spedding 2010). In the next two chapters, we highlight a few major characteristics of Lean and the main principles of Six Sigma separately while, in the last subchapter of Chapter 1, we explain the fusion of Lean and Six Sigma that creates *Lean Six Sigma*.

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[2] "Waste" activities are activities which create no added value from the customer's point of view.

1.1 Lean – Focus on speed and *efficiency*

"Lean" focuses on speeding up the process to be able to deliver a service on time, excluding unnecessary delays, loops and waste. It is a systematic approach to eliminate waste through continuous improvement, providing a product only when the customer needs it (pull principle) and striving for perfection (Andersson et al. 2006). It provides useful tools for analysing process flow and delay times in a process. It centres on the separation of "value-added"[3] from "non-value added" work and provides a means for quantifying and eliminating the cost of complexity (George 2003a). A reduction of variability consequently means less variation in the quality of a service or product (Arnheiter and Maleyeff 2005).

Examples of the process elements which are not lean but are defined as waste are extra processing, transportation, underutilised people, overproduction, corrections, inventory and waiting (A.M.T. successfactory and Uckert Sigma Consulting 2015). In order to avoid waste in the processes we follow lean principles which we summarise in Figure 1.1. The first principle is to understand customer *Value* – it is only what the customer values that is important. The second principle is to analyse *Value stream* by mapping the process and finding out which activities add value for the customer and which do not. The ones which do not add value must be modified or removed from the process. Another principle, *Flow*, refers to building up a continuous flow through production or the supply chain and not moving commodities in large batches. The fourth principle is *Pull* which means that no work is carried out unless required by the customer. *Perfection* means the elimination of waste and non-value-adding activities amid continuous improvement, as McCurry and McIvor (McCurry and McIvor in Andresson et al. 2006) say: "There is no end to reducing time, cost, space, mistakes, and effort".

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[3] "Value added" is anything the customer is willing to pay for.

Figure 1.1: Lean principles
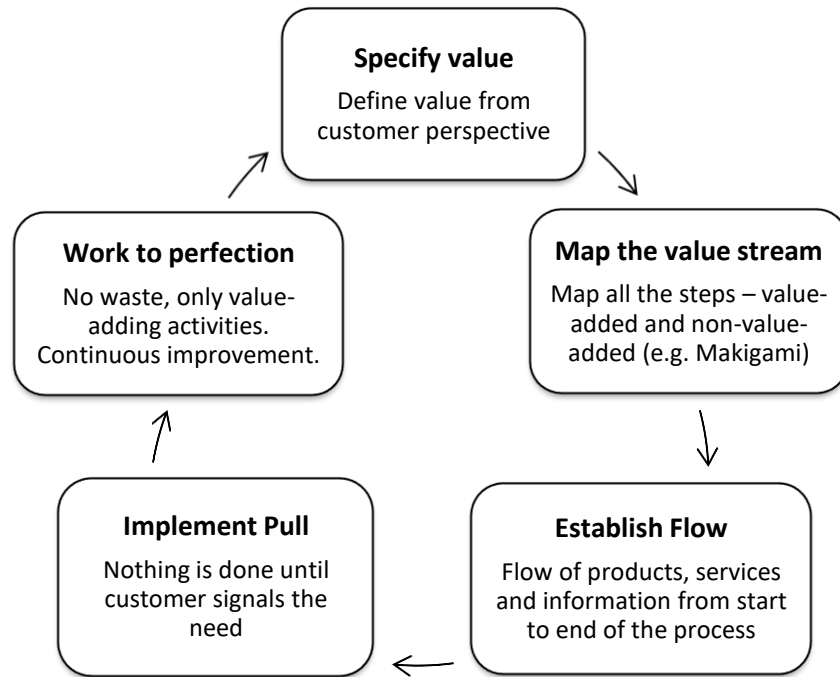
Source: B. McCarron in A.M.T. successfactory and Uckert Sigma Consulting (2015, 12).

The theory of lean management divides activities into three major types, as we demonstrate in Figure 1.2. Three types of activities in lean terminology are: value adding, non-value-adding, and waste. Activities which are value adding are continuously optimised to perfection, non-value-adding activities should be reduced, and waste activities according to lean theory in the process must be eliminated.

Figure 1.2: Three types of activities

Value-creating activities	Non-value-creating activities	Waste
• Any activity that takes material or information and converts it in a way that meets the customers'needs. • The customer is willing to pay for these services	• Any activity that is needed due to the systems and processes in use • Does not contribute any value to the product, service or customer satisfaction	• Activities, processes, time, materials, space, etc. that do not increase the value of a product or service • Activities not needed for the system or process • Waste removal improves business performance
↓	↓	↓
OPTIMISE!	REDUCE!	ELIMINATE!

Sourced from: Nave (2002, 75); A.M.T.successfactory and Uckert Sigma Consulting (2015, 13).

Companies also follow lean principles for many other benefits like: Increasing transparency, better customer satisfaction, higher quality performance, better motivated employees and sustainable implementation of changes. Lean processes can potentially improve productivity by 25%–30% (A.M.T.successfactory and Uckert Sigma Consulting 2015). The strength of *Lean* lies in setting standard solutions to common problems and its customer focus. When analysing the process, the whole flow is taken into consideration, not only its parts (de Konig et al. 2006).

1.2 Six Sigma – Focus on quality and *effectiveness*

Six Sigma eliminates defects. In many sources Six Sigma is called the "Zero defect philosophy". It requires data-driven decisions (statistical approach) and recognises that variation hinders high-quality service delivery. To be able to do so, it offers a set of quality tools and a framework for effective problem-solving where solutions should be based on data. Business processes reworked using Six Sigma tools bring sustainable results. One of the most important Six Sigma principles is to strive for stable and capable processes to fulfil customer requirements. In this sense, Lee and Choi (Lee and Choi in Hilton and Sohal 2012, 1) label Six Sigma an "improvement methodology" to enhance an organisation's competitiveness.

Six Sigma is a top-down business strategy (it must be supported and sponsored by leader(s) of organisations). Anbari and Kwak describe it as a "project driven management approach to improve organisation's products, services and processes by continually reducing defects in the organisation" (Anbari and Kwak 2004, 1). Anbari (Anbari in Anbari and Kwak 2004) points out that Six Sigma is more comprehensive than some earlier quality initiatives (e.g. Total Quality Management – TQM and Continuous Quality Improvement – CQI). In addition, Six Sigma also includes measured financial results, uses advanced data analysis tools, focuses more on customer requirements and uses project management tools and methodology.

When it comes to project management and the implementation of Six Sigma projects, the DMAIC (Define-Measure-Analyse-Improve-Control) model is in use, which will be explained later. It is important to be able to measure the outcome of the process and the process itself. It is generally known that outcomes of the process depend on its inputs as shown in Figure 1.3 and the formula below:

$$Y = f(X1, X2, X3, \ldots)$$

*where X (**inputs**)* apply to factors of production – process variables (e.g. land, material, equipment, management, etc.). *Y (**outputs**)* depict the products or services as results of inputs. Outputs are delivered to the customer or a user. Six Sigma requires understandable,

consistent, correct, complete and on-time outputs for the final customer. ***Process*** is the way in which the inputs are combined in order to add value (e.g. production of something, delivery of something – invoicing, procedures, processing, transporting, storing, etc.) (George 2003a; Jöbstl and Freisinger 2015).

Figure 1.3: Outcomes of a process are the result of what goes into the process

```
┌──────────┐          ┌──────────┐          ◇────────◇
│  INPUT   │  ──────▶ │ PROCESS  │  ──────▶ │ OUTPUT │
└──────────┘          └──────────┘          ◇────────◇
     X                                           Y
```
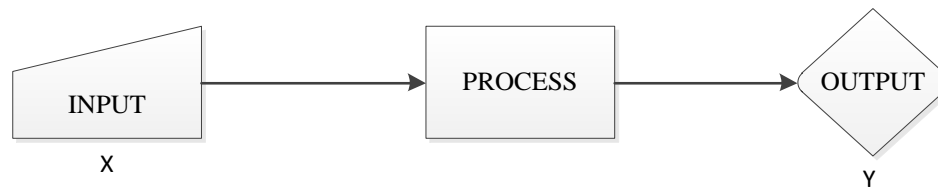
Originally Six Sigma was focused on manufacturing processes. Yet these days the Six Sigma philosophy is also used in administrational and supportive functions (e.g. marketing purchasing, billing, invoicing) in companies. One of the first implementations of Six Sigma was at Motorola in the 1980s. The aim was to reduce costs caused by not doing things right already the first time and costs of not meeting quality requirements of its customers. Afterwards, other companies, e.g. Texas Instruments, Allied Signals, Kodak, Sony, General Electrics, etc. also implemented Six Sigma and as a consequence experienced large savings (Antony and Banuelas 2002).

Some authors call Six Sigma a *business strategy* which combines statistical and non-statistical tools and techniques. Six Sigma differs from other quality improvement initiatives in many respects. First, it places a clear focus on achieving measurable financial returns. For business success, it stresses the importance of strong, passionate and committed leaders who can integrate human elements (company culture change, customer focus, belt system, etc.) and process elements (process management, statistical analysis of process data, measurement system analysis, etc.). Contrary to some other quality initiatives, it uses tools and techniques to fix problems in a business process in a sequential and very disciplined fashion, offering clear rules on when, where, why and how these tools will be used. Six Sigma creates a clear infrastructure of Six Sigma professionals – a so-called belt structure where the colour of the belt represents a person's stage/proficiency in a Six Sigma

area. The Six Sigma structure consists of champions, master black belts (MBBs), black belts (BBs) and green belts (GBs) that work in accordance with the Six Sigma principles. The main focus of Six Sigma is on data – decisions are made based only on facts and figures. Measurement and statistical thinking becomes an important element in the company culture (Anthony 2004).

Six Sigma projects are initiated top down, following the company strategy. Members of steering committee are the main promoters of the project. Six Sigma project teams are temporary and interdisciplinary teams which focus on process improvement. A successful project results in financial savings. The aspect of financial savings is very important since the average costs of companies due to poor quality (COPQ) can amount to 20%–30% of revenue (A.M.T. successfactory and Uckert Sigma Consulting 2015).

The two main Six Sigma goals are to increase the effectiveness of processes by doing things right already the first time (reducing errors) and increasing internal or external customer satisfaction by fulfilling customer requirements. There is a general rule that the Six Sigma defect rate is equal to or below 3.4 DPMO[4], or that the success rate is 99.9997% (see Figure 1.4 for a graphic presentation of standard deviation). Sigma is a term used to represent the variation from the process average (Antony and Banuelas in Anbari and Kwak 2004, 2). Defect means anything that can lead to customer dissatisfaction.

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[4] Defects per million opportunities.

Figure 1.4 Six Sigma standard deviation

Normal Distribution

σ q=68%

q=95%

q=99,9997%

±1 σ

±2 σ

±6 σ
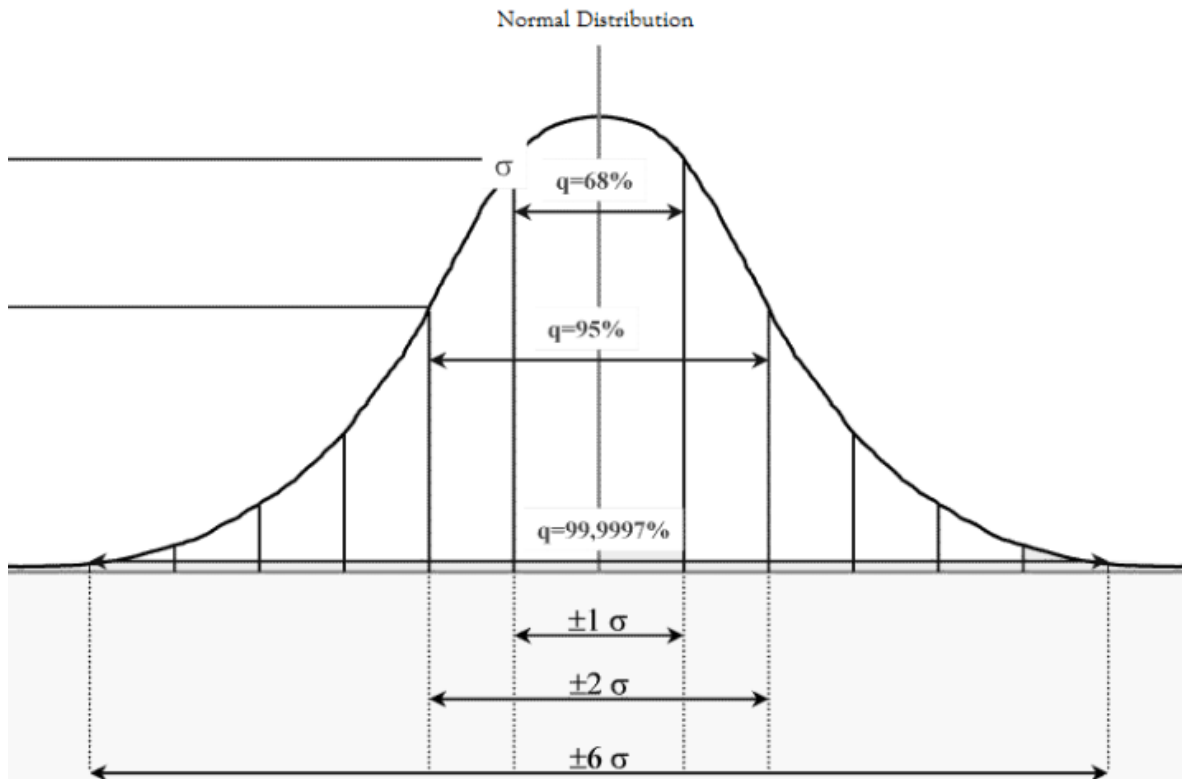
Source: InTech (2011).

Organisational culture and top management support are prerequisites for a successful Six Sigma implementation – the business strategy and Six Sigma must be linked. Leaders are responsible for supporting the cultural change which Six Sigma brings and offering appropriate organisational infrastructure. Leaders as well as other company members should be willing to obtain an understanding and knowledge of Six Sigma. In addition, professionals must understand the Six Sigma tools, methodology and techniques. Six Sigma requires the involvement of leaders in selecting a project and steering such improvement projects. The professionals who lead the projects must have good project management skills and knowledge concerning how to link the Six Sigma approach to customers, suppliers and internal stakeholders (Antony et al. in Kwak and Anbari 2004, 5; Johnson and Swisher in Kwak and Anbari 2004, 5).

1.3 Lean and Six Sigma – *efficiency* and *effectiveness*

Lean Six Sigma is a business strategy offering a methodology that increases the performance results of a process, increases customer satisfaction and helps to make the process more cost effective (Snee 2010). Some authors (Welch in Snee 2010) claim that Lean Six Sigma is a good leadership and personnel development tool.

As mentioned in Chapter 1.1, lean principles mostly concentrate on the speed of the process. With the help of statistical controls, Six Sigma leads to a quality improvement. It is recommended to use the Lean principles and Six Sigma methodology side by side. The traditional Six Sigma focuses on improving the quality of process results (effectiveness) while Lean management concentrates on speed and a reduction of waste (A.M.T. successfactory and Uckert Sigma Consulting 2015).

George (George 2003a) states that *Lean* identifies inefficiencies and waste in all processes – be they in manufacturing or services – focusing especially on speed, flexibility and quality and Six Sigma spotlights accuracy and precision. In any case, both approaches have a strong customer focus. Lean ensures a smooth and uninterrupted process flow and focuses only on what is important for the customer. Six Sigma particularly stresses "critical to quality" processes or operations and reduces costs by reducing variability. It also ensures that the strategically right projects are selected (Arnheiter and Maleyeff in Manville et al. 2012, 11).

1.4 Lean Six Sigma and interfaces to the human resources function in companies

Lean Six Sigma is not only a method concerning how to lead process improvement projects, but also includes many elements of the human side of making business improvements. Managing people, co-creating the corporate culture, leadership, people development, mentoring, training and change management are only some of the areas where strong interfaces appear between Lean Six Sigma initiatives and HR functions in

companies. In this chapter, we outline some HR activities which support the success of Lean Six Sigma projects.

HR needs to be involved already at very beginning of projects. It starts by selecting the people who will participate in Lean Six Sigma initiatives. Employees involved must have good functional, team management and leadership abilities. In the Six Sigma literature we can find a checklist of the technical, leadership and other strengths required from candidates to have in order to be able to start with the Lean Six Sigma education. Since not all candidates have the same starting point considering their experience, knowledge and personal strengths, HR has to ensure that project managers receive appropriate trainings about teamwork, conflict management, communications, dealing with difficult team members, etc. On the other hand, HR should ensure a good ROI[5] to human capital.

When teams are formed, HR has to be concerned with the retention of Lean Six Sigma talents. In addition to development opportunities, transparent career paths and a supportive environment, it is the responsibility of the HR function in a company to adjust the system of rewards to support Lean Six Sigma.

Another area where HR support is needed is change management and communication focusing on the human side of Lean Six Sigma. HR should be strongly involved in communicating to the organisation the value derived from the new ways of working. In this sense, HR actively co-creates the Lean Six Sigma culture in the organisation – data driven, proactive and customer oriented. On the other hand, HR intensively helps executives and Lean Six Sigma teams identify which elements of the organisational culture are "inhibiting forces" on the achievement of the Lean Six Sigma goals and take actions accordingly.

HR can only successfully contribute to a Lean Six Sigma initiative when in possession of basic knowledge about the tools and the Lean Six Sigma language. This means HR team members must have at least a basic understanding of the Lean Six Sigma principles. In addition, it is recommended that HR acts as a role model and becomes one of the first functions to adopt the Lean Six Sigma way of improving processes in the department. In this way, HR will achieve excellence in process delivery, reduce defects and gain credibility in Lean Six Sigma-related questions.

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[5] ROI - Return on investment. ROI is a performance measure used to evaluate the efficiency of an investment.

2 DMAIC – THE LEAN SIX SIGMA IMPLEMENTATION METHODOLOGY

Lean and Six Sigma projects employ the systematic DMAIC approach to implementations. Figure 2.1 demonstrates this systematic approach using the Pre-define, Define, Measure, Analyse, Improve and Control Phases in the DMAIC cycle and lists the tools used in each.

Figure 2.1: The DMAIC Process and Tools

PRE-DEFINE	DEFINE	MEASURE	ANALYSE	IMPROVE	CONTROL
• Department structure analysis • Order structure analysis • SWOT analysis	• SIPOC • VOC • CTQ table • Target table • Force field analysis • Project charter (incl. sponsor and project team)	• Makigami • Activity structure analysis • Cost structure analysis • Waste check	• Hypothesis testing • Correlation • Regression • ANOVA	• Creativity methods • Assessment tools • Action list • Gantt diagram • 5S • Poka yoke	• Documentation • Standardisation • Statistical process control • Control plan

Sources: George (2003a, 243); A.M.T. successfactory and Uckert Sigma Consulting (2015, 25).

There are various tools and methods available in each phase. DMAIC offers rough guidelines about which tool to use in which phase. In any case, the project manager can decide to use some tools in a phase other than DMAIC theory advises, to reuse the same tools in different phases, not to use some tools at all or to use additional tools or methods if necessary (Unterlechner et al. 2009).

Some authors (A.M.T. successfactory and Uckert Sigma Consulting 2015b) mention the *Pre-define Phase* as a separate phase in the DMAIC model. However, the majority of Lean Six Sigma experts merge activities from the *Pre-define Phase* into the *Define Phase*.

Before a Lean Six Sigma project officially starts, the so-called *Pre-define Phase* can take place. In this phase the selection/prioritisation of the processes to be improved is made with the aim to come to a final decision about the improvement project. The prerequisite for selecting the process is to understand the department structure, responsibilities and services provided by the department. At this stage, we also make an overview about costs in department (Cost structure analysis) by clustering internal costs by employee groups and researching what are the biggest external costs. For each internal or external activity offered by a particular department, competitors exist – in- or outside of the organisation. To benchmark the competitiveness of the department in question it is necessary to take a closer look at the services, products and prices which competitors offer. Benchmarking of the department's competitiveness enables the department's corporate development. Another recommended method for use in the Pre-define Phase is a SWOT (strengths-weaknesses-opportunities-threats) analysis of the department. With the help of the Order structure analysis method, we list the major products/services of the department and cluster them in bigger groups. To determine the significance of particular activities, we add the information about frequencies (business occurrences) and responsible team members for a particular process. Order structure analysis shows which activity groups are the most frequent in the department. With the help of a prioritisation matrix we rank activities by priorities. The outcome supports the decision-making process on which process to select for improvement using Lean Six Sigma (Jöbstl and Freisinger 2015).

Various requirements exist concerning which processes are to be improved by Lean Six Sigma projects. First, the expected improvement of the Lean Six Sigma project is important for the customer or for the company. Second, it supports strategic company goals by improving the processes with a big impact and which will exist for a long time. Another requirement is that at the time of selecting the Lean Six Sigma project the solution is still unknown. The project scope, resources and targets should be clearly fixed and it is recommended that the process improvement is carried out by a team (Jöbstl and Freisinger 2015; A.M.T. successfactory and Uckert Sigma Consulting 2015b).

Kwak and Anbari (2004, 5) claim that Lean Six Sigma projects have to be "organisationally feasible, financially beneficial and customer oriented".

In the *Define Phase*, we specify the requirements and expectations of the customer. We also determine the project's boundaries and picture the process by mapping the business flow. At the end of this phase, goals and responsibilities are established and we understand the project's mission.

In the *Measure Phase* we develop a data collection plan. We document and quantify the initial situation by measuring the process. Here the data are collected and compared to determine issues and shortfalls. Hypotheses about the root causes are set.

In the *Analyse Phase* we analyse hypotheses, causes of defects and sources of variation. Until this step of the implementation, many improvement opportunities have been found and in the Analyse Phase these opportunities are prioritised.

In the *Improve Phase* we enhance the process in order to eliminate variations and develop creative alternatives.

The *Control Phase* serves to control process variations to meet customer requirements and develop a strategy to monitor and control the improved process. In this step, we improve systems and structures, introduce a sustainable process solution and ensure ongoing stability (McClusky in Anbari and Kwak 2004; A.M.T. successfactory and Uckert Sigma Consulting 2015c).

A short summary of the DMAIC performance improvement model is presented in Table 2.1 below:

Table 2.1: DMAIC Model – Summary

D	**Define** the goals of the improvement activity.
M	**Measure** the existing system.
A	**Analyse** the system to identify ways to eliminate the gap between the current performance of the system or process and the desired goal.
I	**Improve** the system.
C	**Control** the new system.

Source: Pyzdek (2003, 4).

In the following chapters we explain each phase in more detail. We mention the most commonly used tools and methods in each of the phases.

2.1 The Define Phase

In the Define Phase, Lean Six Sigma offers various tools and methods that can be used to ease the process implementation. In this stage of the project, we define the goals of the process improvement, its inputs and outputs and the purpose of the process in general. We also specify who the customers are – be they external or internal – and ask them about their expectations and requirements. We systematically write these requirements down and set measurable targets (Critical to Quality – CTQ) to better meet these requirements. We make a project plan and communicate the project start (kick-off). Table 2.2 provides an overview of the tasks and tools used in the Define Phase (Jöbstl and Freisinger 2015) and in Figure 2.2 we summarise the main outputs of the Define Phase.

Table 2.2: Lean Six Sigma Define Phase – Activities and tools

Activity	Tool
Definition of the process which was selected to be improved	SIPOC
Understand customer requirements within the process	VOC
Definition of measurable CTQs	CTQ table
Definition of the project goals (including measurable target values)	Target table
Calculation of potential cost savings	
Analyse driving and inhibiting forces, make a plan for how to reduce the inhibiting forces and increase the driving forces	Force field analysis
Plan the project	Project definition sheet/Project charter
Release the project by presenting it to the sponsor	Project definition sheet/Project charter

Source: A.M.T. successfactory (2015a).

Figure 2.2: Main outputs of the Define Phase

Define Phase

❑ Customer's needs understood and transferred to CTQs
❑ Project mission defined and included in a detailed project plan
❑ Goals and measurable objectives defined
❑ Project mission clear, project team defined
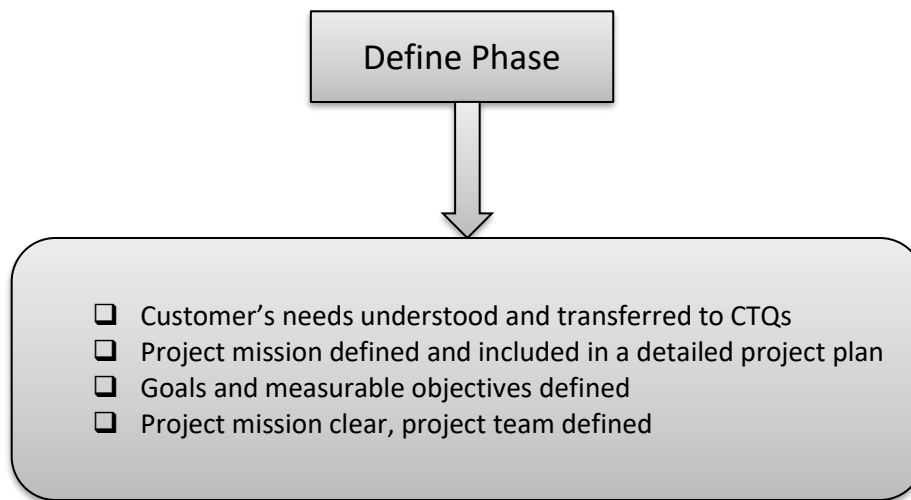
In the continuation of this paper, we describe the tools and activities used in the Define Phase in greater detail.

2.1.1 SIPOC (Supplier-Input-Process-Output-Customer)

In the majority of business processes particular employees are only responsible for part of the process. Consequently, the holistic view of the process is not understood within the organisation. People involved in the process might not understand what is the purpose of the process, what are the interdependencies between the process steps and who else is involved in the process.

Since a key goal of Lean Six Sigma is to satisfy the customer, drawing a SIPOC (Suppliers-Inputs-Process-Outputs-Customers) map is the first recommended tool to use to allow a high-level process view of how a particular customer requirement is satisfied. SIPOC helps identify the scope of the project (Mandahawi et al. 2011).

In a SIPOC process map *Suppliers* applies to people, processes, company, departments, etc. which provide whatever is worked on in the process (information, forms, material…). The

supplier can be internal or external. *Inputs* signify the material or information provided. *Process* determines all the steps used for a transfer. Finally, *outputs* (products or services) are delivered to the *customer*. By listing all customers of the process, we can already in this step add in information concerning the major requirements of a particular customer/customer groups (George 2003a).

The SIPOC diagram provides a visual view of the process and facilitates understanding of what needs to be changed in the process. A SIPOC process map is very valuable especially in non-manufacturing settings because in services process and systematic thinking are not so common (Montgomery and Woodall 2008).

2.1.2   VOC (Voice of customer)

Customer satisfaction is a guiding principle while implementing Lean Six Sigma (Psychogios et al. 2012). In cases where a particular supplier offers services to internal customers, these customers are called *Process Partners* (the reason for this naming is the awareness that "everyone inside the company should be working together to best serve the ultimate customer") (George 2003a, 367).

With performing Voice of customer research, we ask process partners or customers about their current satisfaction with the product/service delivery (in case the product or service already exists), or we ask them how they see the delivery of a product or service if it does not exist yet.

Before questioning customers, we cluster them in bigger customer groups (it is not necessary that all customer groups have the same needs). For voice of customer analysis reactive (old reviews, complaints…) or proactive (we perform interviews/send questionnaires to stakeholders within the scope of the improvement project) sources can be used (A.M.T. successfactory and Uckert Sigma Consulting 2015c).

It is important to formulate the interviews/questionnaires in such a form that later it is easy to provide measurable responses (Unterlechner et al. 2009) so as to also facilitate quantitative analysis. Through each question or question group it is advised to ask the

customer/process partner about the significance of a particular aspect so that a subsequent comparison of these results with the current fulfilment degree is made possible (A.M.T. successfactory and Uckert Sigma Consulting 2015c).

2.1.3 CTQ (Critical to Quality)

VOC results show major customer needs and priorities. CTQs are the customer's needs, requirements and expectations about the product or service presented in a measurable and more detailed way. For each CTQ we define a metric and a target value. In other words, general needs which are translated into more specific measurable needs are CTQs (Jöbstl and Freisinger 2015).

2.1.4 Force field analysis

Before officially starting a project, brainstorming with the team is performed where "drivers to" and "restrainers from" the desired goal are specified. When the driving and inhibiting forces are known, the team can design an action plan for how to reduce the inhibiting forces and how to increase those forces which lead movement in the right direction. Optionally, we can assign "strength weights" to the driving and inhibiting forces (e.g. weak, moderate, strong) (Pyzdek 2003).

2.1.5 Project charter

A project charter is a short document in which all major facts about the project are summarised. At the beginning of the document, the initial situation/symptoms are described (Why is there a project? What triggered the project?). Further on, we can list other business processes to be affected by implementation of the Lean Six Sigma project. Listing major

benefits is part of the project charter as well. SMART[6] project goals and project non-goals are defined. Lean Six Sigma projects require targets to be expressed in a measurable way.

Further, the core and extended teams must be defined. At the end, clear milestones with the deadlines are also established. With the help of the tools used in the Define Phase, we identify the requirements of process partners and convert these requirements to CTQs. We define the project scope and benefits of implementation. We execute the first workshops with the project team and present the project charter to the project sponsor (A.M.T. successfactory and Uckert Sigma Consulting 2015c).

2.2 The Measure Phase

In the Define Phase we identified the problem – we selected the process which needs to be optimised. At this point of the project we are gathering raw data about the process. These data will be analysed in the next phase – the Analyse Phase.

In the Measure Phase, the flow, feedback loops, measurement-control points, and hand-offs across organisational groups are mapped for the processes. With the help of this information the processes can be divided into logical models that provide a quantitative understanding of the process. Then, the process evaluation can be executed. Actual process data should be used to ensure a reliable process evaluation (Watson 2004).

The Six Sigma approach requires data-driven management. Therefore, improvements are based on facts and data which we gather in the Measure Phase. Lean management and some other improvement methodologies do not analyse so intensively the "as is" process, but start already with making improvements in very early stages of the process (George 2003).

It is common for services in need of data that these data have never been collected before, are unavailable or do not show what is supposed to be measured (George 2003). Consequently, measurements have to be performed in the scope of the improvement project.

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[6] SMART – Specific – Measurable – Achievable – Relevant – Time-Bound.

In Table 2.3 we list the most recommended Lean Six Sigma tools and methods for service environments for use in the Measure Phase. In Figure 2.3 we summarise the main outputs of the Measure Phase.

Table 2.3: Lean Six Sigma Measure Phase – Activities and tools

Activity	Tool
Together with the project team perform the first process-oriented analysis to understand the process and collect data	Makigami
Usage of existing data – determine what needs to be known about the process and plan where to look for the data.	Data collection plan
Deep-dive analysis – measure the time for specific activities within the process steps	Time studies, Activity structure analysis
Calculation of the process costs	Process costing
Check the accuracy and reliability of the measurement process by performing appropriate measurement system analysis	MSA (Measurement system analysis)
Usage of suitable techniques for data presentation	Examples: Pareto-Diagram, Histogram, Line diagram, Bar chart, Box Plot, Scatter diagram, Timing chart…
Calculation of suitable statistical parameters to describe average and scattering behaviours	Examples: Sample characteristics; Distribution type – Probability distributions, Process capability, Sigma level
Calculation of suitable lean metrics to illustrate/quantify the problem	Examples: Flow factor, Lead time, Utilisation, Physical lead time, Work in progress, Throughput per time, Capacity, Rolled throughput yield
Implement the first quick wins	Action plan

Source: A.M.T.successfactory (2016c).

Figure 2.3: Main outputs of the Measure Phase
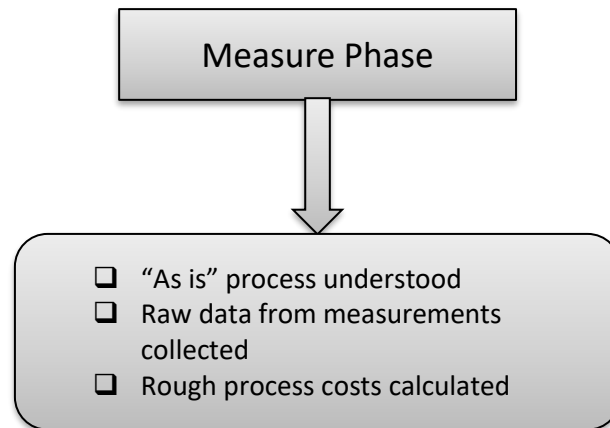
2.2.1 Makigami

Makigami is a process mapping tool. It shows a step-by-step process flow so it is recommended to draw Makigami with the cooperation of all functions/people involved in the process. Each step is the subject of further analysis. For each process step, we define which function is responsible for performing a particular step. The total duration of each activity in a process step is measured, while establishing whether that activity is value added, non-value-added (but necessary – e.g. laws, regulations…) or waste (Chiarini 2013). In Makigami for each process step we also specify which documents/media are used. Transfers from one function/person to another can also be counted. For each transfer, we can define whether the transfers are successful or not. Further, we list all the problems occurring during particular process steps and add solutions to these problems. For process steps which are more time-consuming and comprise several sub-steps, we can make a deep-dive analysis by investigating sub-steps, e.g. by using Activity structure analysis (Jöbstl and Freisinger 2015; A.M.T. successfactory and Uckert Sigma Consulting 2015d).

2.2.2 Time studies/Activity structure analysis

Estimations of time consumed for particular process steps that we gathered with the Makigami tool give us an overview of which process steps are the most time-consuming. For these process steps we analyse in greater detail the steps and activities of these sub-steps in order to discover potential improvements. When making a time study, dedicated person measures all activity times within the observed process step (Jöbstl and Freisninger 2015). Being aware of the most time-consuming steps is important due to the fact that "In any slow process, 80% of the delay is caused by less than 20% of the activities. We only need to find and improve the speed of 20% of the process steps to effect an 80% reduction in cycle time and achieve greater than 99% on-time delivery" (George 2003a, 13).

Unlike time studies, where an external person measures the times, while performing Activity structure analysis the persons actually responsible for the activities in the process steps record the activity times themselves. When Activity structure analysis is carried out on the department level and includes all tasks, the main goal of the person responsible for the project and the manager responsible for the department is to ascertain whether the tasks are optimally distributed function-wise among the employees in the team. Whether any redundancies exist as a result of unclear responsibilities can also be determined. Activity structure analysis results also provide initial ideas about possible combinations of tasks such that fewer process loops and interfaces would occur (Jöbstl and Freisinger 2015; A.M.T. successfactory and Uckert Sigma Consulting 2016a). Activity structure analysis can also be used for particular process steps only to deep-dive into the step and identify any optimisation opportunities.

For all employees who record the time of the activities they work on in the process, we prepare daily activity structure analysis forms. Each form for daily recording is completed separately for each day for a period of four weeks. Thereafter, all the daily sheets are summarised in the Activity structure summary (Jöbstl and Freisinger 2015; A.M.T. successfactory and Uckert Sigma Consulting 2016a).

2.2.3 Process costing

The "Lean" part of "Lean Six Sigma" is commonly known as a change and improvement method, as well as a cost-reduction mechanism (Bicheno and Anchanga in Näslund 2008). It strives to raise a company's competitiveness by increasing efficiency and cutting costs by eliminating waste and non-value-adding activities (Motwani in Näslund 2008), reducing cycle times (Sohal and Egglestone in Näaslund 2008) and increasing the organisation's profit (Claycomb et al. in Näslund 2008).

To be able to calculate cost savings of each improvement project, it is necessary to measure the current process costs and the costs after the process improvement.

Especially in services, process costing is strongly connected with the recording of activity times. After activity times are summarised in the activity structure summary, we see how much time is spent on a certain process or process step. Having information about the price per unit (hourly rates), time needed and frequency of business occurrence enables us to calculate the process costs. These results show which are the biggest cost drivers and where costs can be reduced (Jöbstl and Freisinger 2015; A.M.T. successfactory and Uckert Sigma Consulting 2016b).

2.3 The Analyse Phase

In the Measure Phase we collected raw data by measuring the process steps and activities within our selected process. In the Analyse Phase we analyse the raw data gathered in the Measure Phase with the aim to extract value from the data.

Major tasks in the Analyse Phase are to review and organise the data collected in the Measure Phase. Based on the gathered data, we can analyse process stability and process capability and determine the root causes of the current process status (Albeanu et al. 2010).

By analysing raw data, we identify possible causal relationships between the inputs and CTQs (de Koning et al. 2006). In this phase, a thorough diagnosis of the current situation is made to identify the main factors that may influence the CTQs (de Koning et al. 2008). We analyse hypotheses on the sources of delay, waste and poor quality which we set in the Measure Phase (George 2003a; A.M.T. successfactory and Uckert Sigma Consulting 2016d). It is a great challenge in this phase for teams to stick to data and to not rely on experience and opinions to make conclusions about problems and their causes. The tools most commonly used for root-cause analysis are the Ishikawa diagram, 5 Whys analysis, Scatter plot, design of experiments, etc. (George 2003a). We summarise the most frequently used tools in the Analyse Phase in Table 2.4. In Figure 2.4 we list the main outputs of the Analyse Phase.

Table 2.4: Lean Six Sigma Analyse Phase – Activities and tools

Activity	Tool
Find additional problems/potential in a systematic way. Use lean principles.	Muda hunt checklist
Search systematically and in the team for all possible causes of the problems identified in Makigami.	Ishikawa diagram, Mind map
Differentiate between "type 1" and "type 2" causes and define hypotheses concerning "type 2" causes	Hypothesis list
Analyse existing data to prove hypotheses with the help of appropriate statistical techniques	Regression analysis, statistical tests, ANOVA
Answer the corresponding hypotheses based on numbers, data and facts (relevant causes shown)	Hypothesis list
Drill to depth relevant causes to ensure the problem was understood	5 Whys analysis
Visualise the results (relevant X) of the analysis phase in the process chain	Makigami

Source: A.M.T.successfactory (2016e).

Figure 2.4: Main outputs of the Analyse Phase

Analyse Phase

- ❑ Quantitative understanding of current process performance
- ❑ Causes of current process status understood
- ❑ Understanding influencing factors
- ❑ Sources of variation are detected
- ❑ Improvement opportunities prioritised
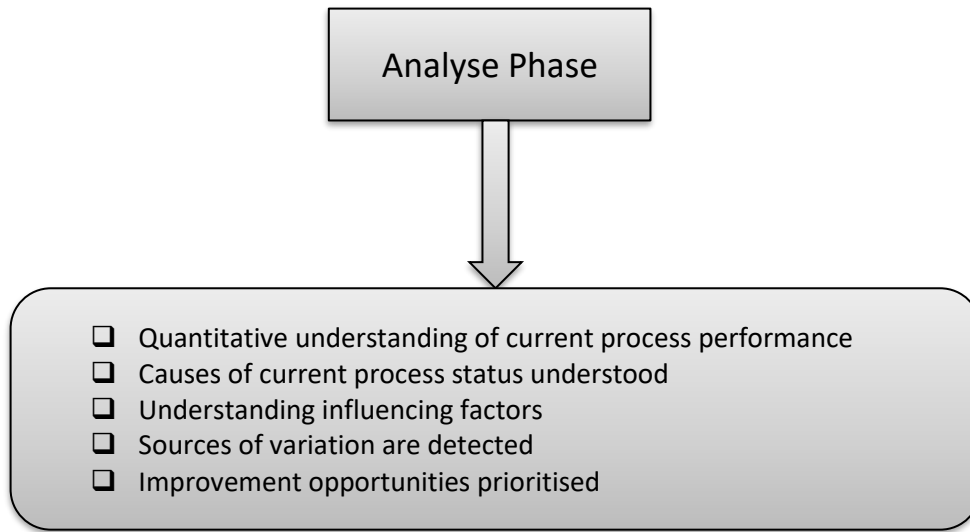
2.3.1 Muda[7] hunt checklist

The goal of lean processes is to eliminate waste (Arnheiter and Maleyeff 2005). One tool used to detect/eliminate waste is the *Muda hunt checklist*. When we identify waste, we can cluster it within a *muda category* (e.g. overproduction, waiting, loops…). When waste and the appropriate category are defined, we ask questions about the waste detected (e.g. Why do we receive so many résumés of unqualified candidates? Why do so many candidates drop out after visiting our town?). After waste is detected, classified and analysed, we derive improvement actions (A.M.T. successfactory and Uckert Sigma Consulting 2016d).

2.3.2 Ishikawa diagram

An *Ishikawa diagram* is also known as a *Cause and effect diagram* or a *Fishbone diagram* (because of its shape). The 'fish head' represents the problem being addressed. The

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[7] "Waste" in Japanese

potential categories of causes of the problem are indicated in the 'fish bones' (e.g. men, materials, methods, machines). Each category of causes is then subdivided again into causes. Another example of categories of causes could be: processes, technology, knowledge, information systems (Beckford 2002). An Ishikawa diagram is usually a product of team brainstorming about the problem in question (Wong 2011). In Appendix G, we demonstrate the Ishikawa diagram we used in the improvement project that is presented in the empirical part of this paper.

2.3.3   Mind map

A mind map drawing starts by creating a central idea in the centre of a page. The main branches of the central idea are then added. We add words or short phrases to the main branches. Optionally, a mind map is completed with images. By adding the next level branches, ideas triggered by the main branches are represented. It is recommended that the next-level branches are thinner and the text/images smaller. Both a mind map and Ishikawa diagram are used to represent a huge amount of ideas on a single page and are mostly used to facilitate brainstorming and trigger new ideas (Ching Tang et al. 2006).

2.3.4   Two types of X[8], White- and Black-box model and a Hypothesis list

There are two types of X. The first group of Xs has an effect on Y and is easy to change. Under the condition that X affects Y and that this X is important, we can move to the next step in the DMAIC model – the Improve Phase. If it is unclear how X affects Y, hypotheses are defined and by analysing raw data gathered in the Measure Phase we conduct a deep-dive analysis (A.M.T. successfactory and Uckert Sigma Consulting 2016d).

When setting hypotheses we can use the white-box or the black-box approach. White box refers to a known area, to experiences, while black box refers to something unknown for

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[8] X applies to inputs, Y applies to outputs (see Figure 1.3).

which we have to perform experiments. We use as many details as possible, taking every factor into account. The black-box model is a determination-free model – using a mathematical approach to find cause-effect relationships. Such an approach only uses the primary cause to explain the effect. However, a strong mathematical or graphical relationship between variables is not yet proof that one variable was caused by another. In addition to a statistically significant relationship, knowledge about the process must support this causal relationship (a combination of the white-box and black-box approaches when analysing) (Rosi et al. 2012; A.M.T. successfactory and Uckert Sigma Consulting 2016d).

2.3.5   Scatter plot

A scatter plot is a simple tool that can help to determine if a relationship between two measures exists. It provides a powerful visual image of how variables are/are not related to process outcomes. With a scatter plot we can conclude if two factors are connected, but the degree of the relationship can only be quantified by other statistical tools (e.g. regression analysis) (George 2003a). A scatter plot cannot predict cause-effect relationships, but can indicate a possible positive, negative or zero correlation between two variables (Basu 2009).

2.4 The Improve Phase

After successfully completing the Measure and Analyse Phases all issues are known and understood. Based on facts and knowledge about the process gathered in previous phases, in the Improve Phase we change the process in the direction to become capable, predictable and able to fully meet the requirements of customers. In rare cases the process performance is so bad that the team decides to apply the DMADV (Define-Measure-Analyse-Design-Verify) methodology instead of the DMAIC one to design and verify a new process instead of improving and controlling the existing one.

A key element of the Improve Phase is change management. It can apply to the process activities of the team members involved or the technology in use. Since when following the Lean Six Sigma methodology the impact on the staff and customers involved is typically big, change management strategies must be developed (Albeanu et al. 2010).

In the Improve Phase actions to modify the process or settings of influence factors are designed in such a way that the CTQs are optimised. In the Improve Phase pilot tests of improvement actions are conducted (De Mast and Lokkerbol 2012). The process is improved by eliminating the root causes and controlling the process to ensure defects do not reappear (Pojasek in Näslund 2008). A stable process is the main purpose of Six Sigma projects (Pyzdek in De Koning et al. 2006) so the Improve Phase holds great importance in the DMAIC model.

In Table 2.5 we summarise the most commonly used Lean Six Sigma tools and methods in the Improve Phase. In this step, we primarily focus on the use of creativity and brainstorming methods in order to come to innovative ideas on how to optimise our process.

Table 2.5: Lean Six Sigma Improve Phase – Activities and tools

Activity	Tool
In a team write down a list of innovative ideas for possible solutions for all relevant causes	10 point checklist, creativity techniques, (Brainstorming, 6-3-6 progressive abstraction, 6 hats)
Use suitable lean management methods to develop solutions	Poka yoke, 5S, Kanban, Controlling/Planning, Prioritising rules, Segmenting, One piece flow, Incentive systems
Develop and draw the "to be" process	Makigami
Assess the ideas using criteria	Cost-benefit matrix
Match the solution with a sponsor/manager/champion and receive their approval	
Develop a plan for implementing the solution, action plan, assessment of the results, schedule	Action plan, Gantt diagram

Source: A.M.T.successfactory (2016f).

The main outputs of the Improve Phase are demonstrated in Figure 2.5.

Figure 2.5: Main outputs of the Improve Phase

Improve Phase

❑ Improve the process by eliminating variations
❑ Define an improved "to be" process to meet customers' requirements
❑ Innovative solutions for process improvement defined using creativity methods
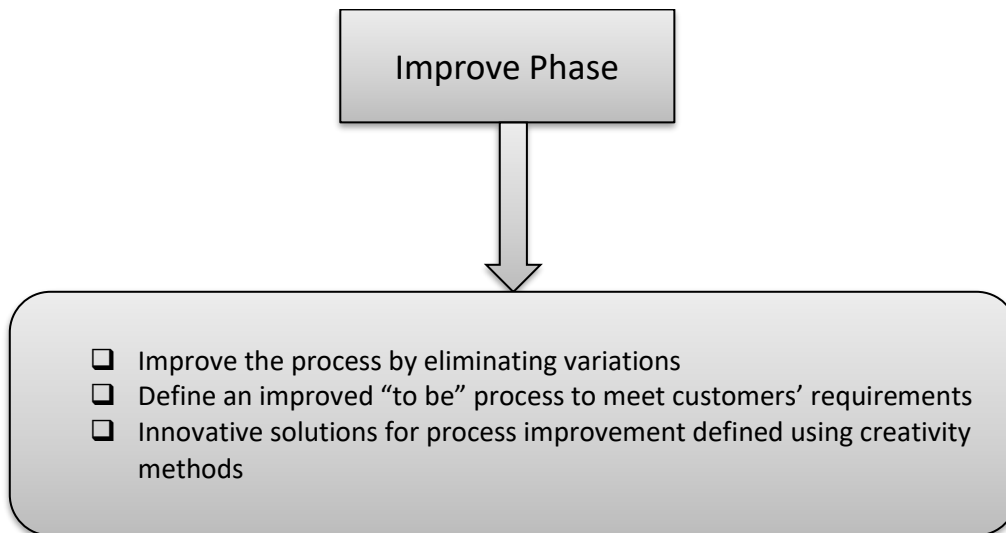
In the continuation of this chapter we describe some commonly used tools in the Improve Phase.

2.4.1 "To be" process definition: 10-Point checklist

10-Point checklist is a step-by-step approach to deriving improvement in a well-coordinated manner. It takes us through important areas where potential is generally hidden.

1. *Create values without waste* – What is really needed by our customers? Keep effectiveness in mind first. Avoid over-processing. Question the tasks as such. Divide the tasks into value adding and non-value-adding.

2. *Reduce and define interfaces* – Information changes when it is passed on. Reduce interfaces with a Makigami flowchart. Are any organisational structure changes necessary?

3. *Minimise follow-up questions and rework* – Can we reduce the loops and failures? The chief causes of queries and mistakes in administration are a lack of information, unclear/unspecific information, unclear distribution of competencies and tasks, constant change in the process, and lack of coordination. Use the Poka yoke principle – design your process so that mistakes are impossible or at least easily detected and corrected.

4. *Eliminate bottlenecks* – With the help of a Makigami analysis and activity structure analysis define any bottlenecks.

5. *Shorten approval loops* – Can we reduce the time to approval? Is the whole approval chain needed? Can we reduce the number of approvers?

6. *Define information requirements* – Which information needs to be transferred from one step to another? Information needs to be provided in a needs-related manner – use standardised templates for information transfer.

7. *Identify important decision points in the workflow* – many business processes have one or more points which are very decisive for how process will proceed from that point on. These decision points must be considered and optimised.

8. *Enable parallel work* – Can the lead time be shortened if we execute some steps simultaneously?

9. *Establish a needs-driven process* – Can we change the push principle to a pull principle? Only provide services actually needed by the following point in the process.

10. *Smooth service delivery process* – Can the input be balanced better? Balance the input, make it more stable – with fewer deviations (Robinson 1997; A.M.T. successfactory and Uckert Sigma Consulting 2016g).

The points include mainly elements from the *lean* area. The list encompasses all the lean principles and it is very practical to use the 10-Point checklist at the beginning of the Improve Phase. Greatest benefit is obtained if the team involved in the process execution in day-to-day business takes part in the workshop where the 10-Point check list is being discussed. The workshop facilitator can combine the 10-Point checklist with other creativity methods (e.g. Brainstorming, Method 6-3-5, 6 Hats etc.) to gather innovative improvement proposals.

2.4.2 Poka yoke

Poka yoke is a zero-defect process standard developed by Shigeo Shingo for manufacturing processes where the operation is stopped when a defect is detected and the process rectified before it is restarted (Beckford 2002).

Poka yoke is a Japanese term that means "mistake-proofing". A Poka yoke is any mechanism in the process that helps an operator prevent (yokeru) mistakes (poka) by eliminating the root cause of the expected error in the process. The essential idea of Poka yoke is to design a process this way that mistakes are impossible (striving for zero defects) or at least where mistakes are easily detected and corrected (Robinson 1997; A.M.T. successfactory and Uckert Sigma Consulting 2016g).

2.4.3 5S

One lean management tools for improving processes is the "5S" principle. "5S" stands for *Seiri (sort; put into order)* means only keeping the items you need and discarding the rest. *Seiton (set; arrange)* implies arranging kept things efficiently and setting them in order. "There should be a place for everything and everything should be in their place". *Seiso (shine; clean)* helps prevent problems by keeping things clean. *Seiketsu (standardise)* refers to after-work maintenance and clean-up. Operating in a consistent way brings consistent results. *Shitsuke (sustain)* means showing discipline, following the rules and maintaining standards (George 2003a; Näslund 2008; Uma 2010).

Introducing the concepts of standardised procedures and workplace improvement following 5S can improve efficiency and responsiveness, which results in cost reduction (Liker and Wu 2000).

2.5   The Control Phase

In the Improve Phase we enhanced the system so that it became capable and in line with the customer's requirements. In the Control Phase, we develop control systems to ensure that the improvements are maintained and the newly improved process can be executed in day-to-day operations (De Koning et al. 2006). In this Phase, a process owner takes over measurements of the process performance. In some cases, adjustments of IT systems in use might be necessary to generate control reports. Control procedures must be simple and easy to use and control metrics should be easy to understand. Data collection has to be automated as much as possible (Albeanu et al. 2010).

In this phase, when the process changes are finished, the project leader (in most cases a Lean Six Sigma black belt certificated person) hands over the process performance measurement tasks to the process owner. For a smoother handover it is recommended that the process owner is already involved in previous stages of the project (George 2003a). The process transfer is done after the improved process has been fully documented and the process owners are well trained on how to control it (Albeanu et al. 2010).

Employing Lean Six Sigma tools the ongoing process performance is measured (George 2003a). Project results are empirically verified and the control system is adjusted so that the process improvement can be sustainable (De Mast and Lokkerbol 2012).

One of the major activities of the Control Phase is to select control metrics which enable tracking of the process efficiency and effectiveness after implementing the improvement process. Dashboards can be used for controlling the process control. In addition, in the Control Phase the intensity of training and communication about the renewed process is further increased to ensure a smooth ownership transfer (Albeanu et al. 2010).

In Table 2.6 we present the main activities of the Control Phase and the most common tools and methods recommended by Lean Six Sigma experts.

Table 2.6: Lean Six Sigma Control Phase – Activities and tools

Activity	Tool
Collect all data that confirm the objective was achieved	Linediagram, Bar chart, statistical tests
Monitor the non-targets and ensure that other key figures have not deteriorated	
Select additional measures to monitor the process performance and to ensure the optimised process' future effectiveness	Statistical process control (SPC) or control charts
Ensure appropriate visualisation and standards to ensure the solution is lived in the future	Visual management, Standardised work (integration in Quality management system, Control of documents, …)
Prepare documentation on the changed process, including the responsibilities	Flow chart
Choose the "owner" of the process which will take responsibility for the optimised process and ensure the continuous implementation of the measures	
Prepare a report that documents the team's work and the data collected during the project and pass this knowledge on to other team members	
Announce other issues and opportunities that previously could not be submitted to top management (Lessons Learned, Review)	
Celebrate the hard work and successful activity of the team	

Source: A.M.T.successfactory (2016h).

In Figure 2.6 we give a short overview of the main outputs of the Control Phase.

Figure 2.6: Main outputs of the Control Phase

Control Phase

❑ Hand over the process performance measurement to process owner
❑ Team trained about how to measure process performance to ensure the stability and sustainability of the improved process
❑ Monitor and control the improved process
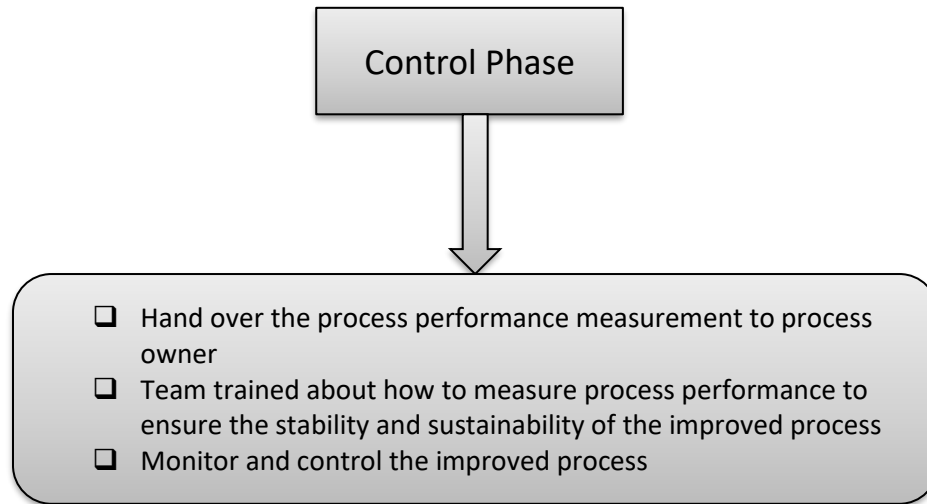
2.5.1   Run chart[9]

Run charts are time series plots. They display process performance over time. When we use them in the Measure/Analyse Phase their chief purpose is to spot patterns in data which show particular trends or analyse types and sources of variation. In the Control Phase, they are used to monitor and control the process performance and communicate findings. Three main types of patterns to look for when interpreting run charts are:

- Runs – any series of eight points that are not on the median or in its close proximity
- Trends – any sequence of seven or more points increasing or decreasing in value
- Cycles – any other pattern that recurs eight times or more

(Albeanu et al. 2010).

With plotting data over time we learn about trends, patterns and variation of data in time. Run chart data allow us to study the effect of improvement efforts. As shown in Figure 2.7, the horizontal line in the middle presents the median – it divides the data points into halves.

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[9] Also known as trend charts or line graphs.

Special focus is kept on non-random patterns around the median to identify non-random variation (Anhøj and Olsen 2014).

Figure 2.7: Run Chart

Source: Anhøj and Olsen (2014).

2.5.2 Control Charts

Control charts enable special causes of variation to be identified. As demonstrated in Figure 2.8, control charts provide visual information as to whether a product or activity is still within specified limits, where two horizontal lines represent the control limits – UCL: upper control limit and LCL: lower control limit. The average difference of random measurements (data points) from the mean is standard deviation. Standard deviation represents the extent of variability. If any points are outside the control limit, this means the process outcome is affected by a special cause. If the data are chaotic and the process is not in statistical control, the focus in the Analyse Phase should be on identifying those things that cause the majority of issues and not concentrating on the outliers (Williams 1994; Albeanu et al. 2010). Control charts are useful for continuous optimisation and control of a process which is already within control limits (Anhøj and Olsen 2014).

A control chart can show that a process is within the control limits, yet the average of the points is too high or too low, or the variation bigger than desired. Control charts can help in

identifying what is the root cause of particular status in the process and based on this fact corrective actions can be planned (Williams 1994).

Figure 2.8: Control Chart
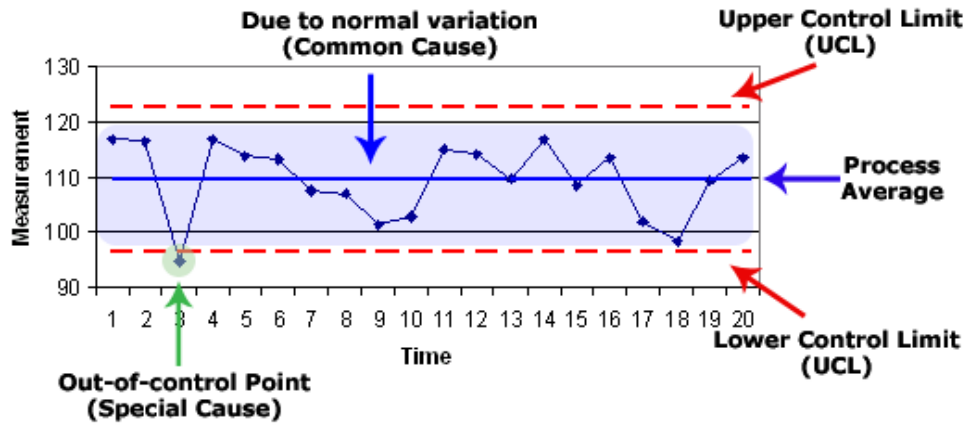
Source: Dylan Miyake (2010).

2.5.3   Process Capability Analysis

Once a process is under statistical control and produces consistent and predictable outputs (as shown in Figure 2.9), we can use capability assessment tools to study the process outputs against the required specifications.

Figure 2.9: Stable process
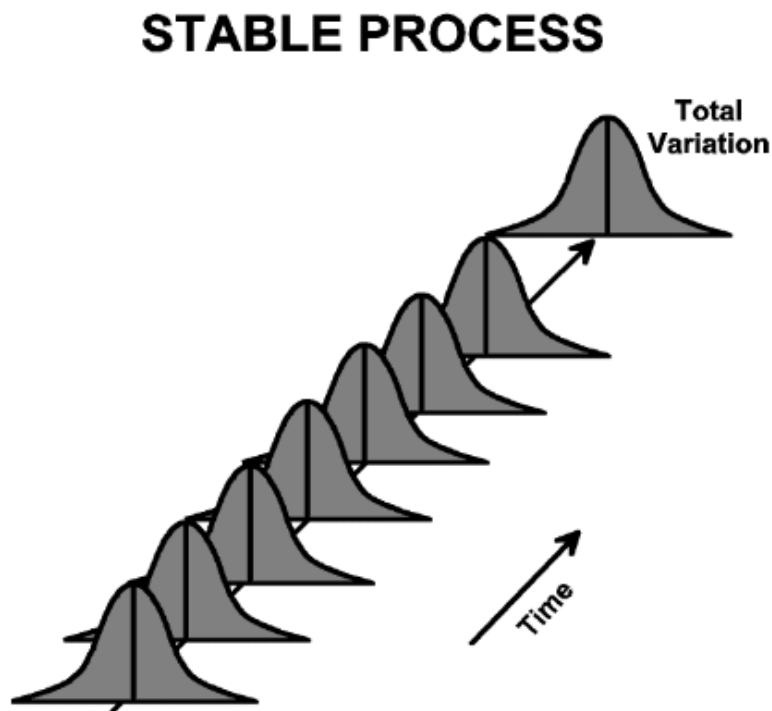
Source: Global Harmonization Task Force (2004).

The process is capable if it falls within the specification limits (Albeanu et al. 2010), when it delivers the quality the customer requires and the error rates are lower than agreed. We visually present a capable process in the upper part of Figure 2.10. The final goal is that the process is capable and controlled (A.M.T. successfactory and Uckert Sigma Consulting 2016i).

Figure 2.10: Not capable vs. capable process
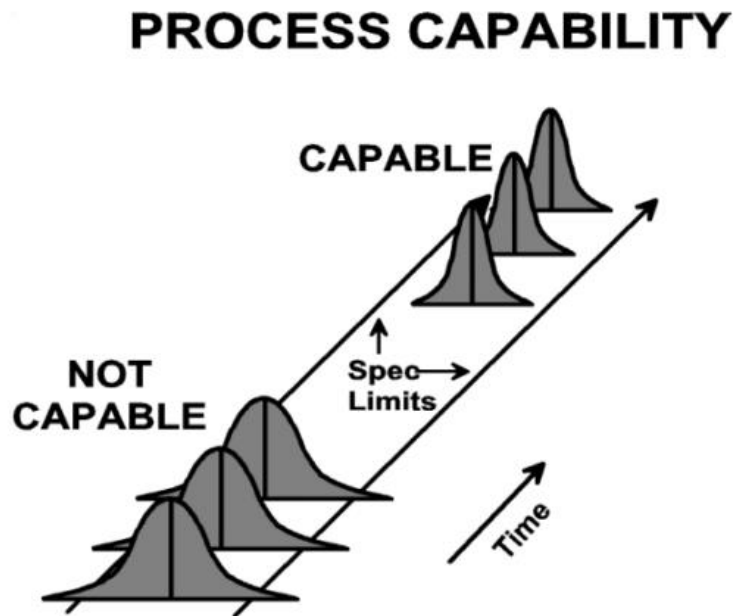
Source: Global Harmonization Task Force (2004).

Capability analysis usually has two main parts:

- A capability histogram – which shows the distribution of outputs of the process, the upper and lower limits as presented in Figure 2.11.
- Capability ratios/indices (C_p, C_{pk}) – numerical values that estimate the capability of the process in considering the upper and lower limits. The values show how well a process that is under control performs within the specification limits (Albeanu et al. 2010).

C_p – shows the process' precision relative to specified tolerances. In other words, it shows the allowed variation of the process and its true variation. The lower the C_p value, the more outputs fall out of the specification limits. We picture different value ranges for C_p in Figure 2.11.

C_{pk} – shows precision and position. It considers whether the process is centred or not (if there is an unwanted offset or not). It shows how close the process is delivering within the limits of the specification. The larger the C_{pk}, the lower the number of occurrences outside the specification limits.

Figure 2.11: Capability histogram in relation to the value of Cp
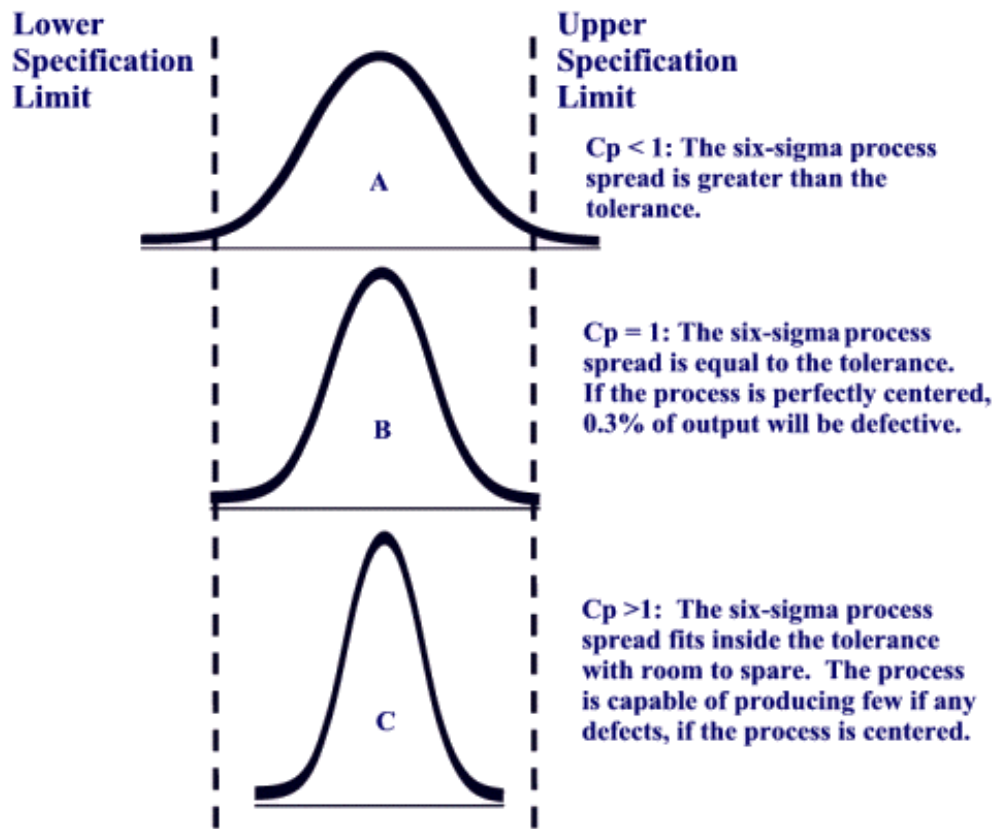
Source: Statistical process control – SPC

3   ONBOARDING PROCESS

Although the main topic of this paper is the use of Lean Six Sigma in services, in Chapter 3 we very shortly present the onboarding process. Onboarding is the process we selected to improve using the Lean Six Sigma methodology. With a brief summary of the theoretical background to onboarding, we wish to bring readers of this thesis to the same understanding of what the term "onboarding" includes so as to ensure smoother reading of the empirical part of this thesis.

Experience shows that employees are given 90 days to prove themselves in a new job (Bauer 2010) and systematic onboarding of new employees is an important factor of a new employee's success. The first step in effective onboarding is the recruitment and selection process. When the recruiter clearly identifies behaviours that are valued in the organisation, the likelihood of the candidate's onboarding process being smoother increases (Bauer 2010). Recruiters play an important role in the recruitment phase. The recruiter's own feelings about the company are often demonstrated when meeting candidates (D'Aurizio 2007). Already during the recruiting process realistic job previews (RJP) must be provided to the newcomer. RJP include job conditions (pay, benefits, working hours, stress, etc.), performance expectations and company culture (Dai et al. 2011). In most companies employee orientation programmes are offered that help new employees understand important aspects of their jobs and organisations (e.g. company culture, organisational goals, history, power structure of the company, etc.). Another role of orientation programmes is their social role – helping new employees feel welcome and getting to know co-workers. It is a task of both parties – the newcomer and the work group to facilitate and ensure that the new employee fits in with the team (Korte and Lin 2012). Orientation programmes can last from a few hours to a few months. A written onboarding plan and IT-systems can support a smoother and more effective onboarding process (Bauer 2010).

3.1 The 4 Cs

According to Bauer (2010), onboarding has four distinct levels (4Cs), as presented in Figure 3.1.

Figure 3.1: 4Cs:

Connection
Culture
Clarification
Compliance
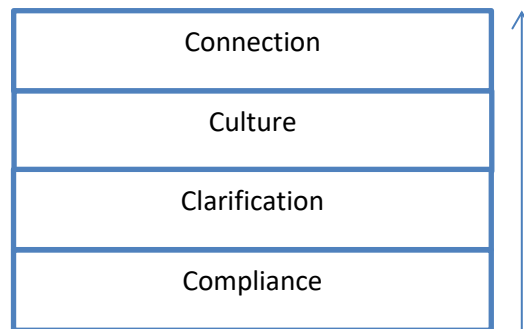
Source: Bauer (2010, 3).

Compliance is the lowest onboarding level. It includes teaching employees basic legal- and policy-related rules and regulations. This level of onboarding is also called the "formal" onboarding or level 1 – PASSIVE onboarding. In this sense, onboarding means a checklist of unrelated tasks which have to be completed. The recruiting process in this case is not considered part of the onboarding process. Companies which achieve the second level of onboarding – *Clarification* – ensure that employees understand their new jobs and expectations from them. *Culture* is a very broad category, providing employees with a set of formal and informal norms. *Connection* refers to interpersonal relationships and information networks that new employees establish. When *compliance* and *clarification* are formally covered within the onboarding process and some elements of culture and connection are in place, then onboarding is at level 2 – HIGH POTENTIAL onboarding. When all four levels are formalised in the company, the company reaches the third level –

PROACTIVE onboarding level (Bauer 2010). We illustrate onboarding strategy levels in connection to the 4Cs in Table 3.1.

Table 3.1: Onboarding strategy levels

Onboarding strategy level	Compliance	Clarification	Culture	Connection
1 PASSIVE	Yes	Some	Little/None	Little/None
2 HIGH POTENTIAL	Yes	Yes	Some	Some
3 PROACTIVE	Yes	Yes	Yes	Yes

Source: Bauer (2010, 3).

3.2 Benefits of the onboarding process

In this chapter, we present short- and long-term benefits of a systematic onboarding process for the newcomer and for organisations. Research shows that 90% of new employees decide to stay or leave the company within the first six months of a new job (Aberdeen Group in Dai et al. 2007). They decide in the first 30 days whether they feel welcome in the organisation (Friedman in Dai et al. 2007).

One short-term benefit is that successfully onboarded employees reach full productivity quicker. This confirms the case study of Ganzel (Ganzel in Dai et al. 2007) which showed that a carefully attended orientation process resulted in two months' earlier productivity. Employees who undergo a systematic onboarding process have greater self-confidence when it comes to job performance. Some authors call this confidence "self-efficacy" – "individual conviction about his or her abilities to mobilise the motivation, cognitive resources, and courses of action needed to successfully execute a specific task within a given context" (Stajkovic and Luthans in Saks and Gruman 2010, 17). When employees are more confident about the fact that they are performing well in their job, they are more motivated and successful in doing the job. Another short-term benefit is role clarity, which is important factor of job satisfaction and commitment. In the onboarding process a new employee socially integrates, where it is positive for an employee's performance if they feel accepted by their peers and superiors. Another important factor of "fitting" the organisation is learning the company's unique language, which is part of its organisational culture. A

further element of organisational culture is to understand the organisation's politics, goals and values (Bauer 2010).

One of the *long-term benefits* of successful onboarding is increased employee engagement and retention. It is more likely that employees will stay with a company for at least 3 years if they experienced a good onboarding programme (Ganzel in Dai et al. 2007). Companies offering good quality onboarding experience higher job satisfaction of employees, their stronger commitment to the organisation, higher performance levels, career effectiveness and lowered stress (Bauer 2010).

3.3   Best practices in the onboarding process

In this chapter, we sum up the best onboarding process practices. The aim of the onboarding process is to help a new employee be productive within a short time. The initial prerequisite for successful onboarding is to find candidates with good potential to be able to integrate into the company's environment. Thus, successful onboarding approaches encourage integrating the onboarding process with the overall hiring management process. It is therefore crucial that after the candidate is selected arrangements are started for the working place of the new employee. On the first working day, formal activities are carried out (e.g. signing official documents and policies, health check, safety instructions, etc.). Besides all these formalities, it is crucial to make the new employee's first working day special – first impressions are lasting impressions. The hiring manager has the task to prepare an onboarding plan for the new employee in written form. On the other hand, the employee should also proactively search for opportunities to facilitate their own onboarding process. An employee's success during the onboarding process can be monitored with on-the-job milestones over 30, 60, 90 and 120 days up to 1 year to check on their onboarding progress. It is essential that at the beginning the superior clearly communicates the following aspects with the newcomer: objectives, timelines, roles and responsibilities. To facilitate onboarding, IT tools can be used (Dai 2007; Bauer 2010).

4 EMPIRICAL PART: ONBOARDING PROCESS OPTIMISATION WITH THE HELP OF LEAN SIX SIGMA METHODOLOGY AND TOOLS IN COMPANY A

In the theoretical part we focused on providing an overview about Lean Six Sigma based on research of the literature. In addition, we shared the knowledge we gained by attending the Lean Six Sigma Black Belt training. We outlined the fundaments of Lean Six Sigma and offered a systematic explanation of the DMAIC approach to project execution.

In the following empirical part of the thesis, we will demonstrate use of some Lean Six Sigma tools and methods in a practical example. The purpose of the empirical part is not to prove/rebut the hypotheses about how successfully the process is bettered after a Lean Six Sigma improvement project is finished. These hypotheses can be proven/rebut only after 6 months to one year from the moment an improvement project goes live. At the time of writing this thesis, the improvement project was in the Measure Phase and so it is too early to measure the project's outcomes. This was the basis for our decision that in the empirical part we would only demonstrate the Lean Six Sigma tools and methods to show their application in services. We will demonstrate the tools and methods used in the Define and Measure Phases and announce and describe which tools we still plan to use in the Analyse, Improve and Control Phases. The final goal is to offer Company A solutions and implement improvements for its onboarding process. The goal of the project is that the improved onboarding process will lead to savings of 25% of internal costs and 20% of external costs.

The structure of the empirical part of the thesis is similar to the structure in the theoretical part – following the DMAIC model. Numerous tools are available for use in each Lean Six Sigma project stage. Depending on the circumstances and needs of a project, we are flexible in deciding which tools to use in a particular stage of a project. In addition, Lean Six Sigma encourages users to slightly adjust the tools to a project's needs if necessary. In the following empirical example, we present some tools used in each phase of the DMAIC project approach.

4.1 About Company A

Company A is a corporation with its headquarters in Central Europe. It employs approximately 10,000 employees. It has plants and sales offices all over the world, mostly in Asia. Company A is a global technical leader in the industry. As shown in Figure 4.1, Company A also achieves relatively good financial results compared to its peers in the industry.

Figure 4.1: EBITDA margin – Company A vs. peers
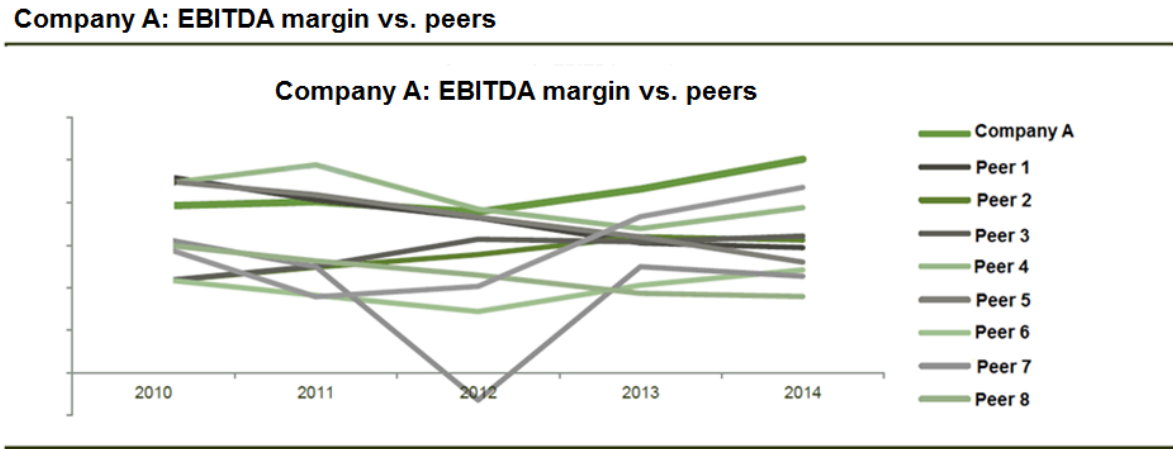
Source: Company A, internal files (2016).

In the 2009/2010 financial year, Company A suffered from the global economic crisis, as seen from most of the financials stated in Table 4.1. After that, Company A was able to recover and emerged even stronger than ever before. After 2011 we can observe relatively rapid revenue and profit growth. In the 2014/2015 financial year, we can see the peak profitability within the last 10 financial years.

Table 4.1: Selected financial data of Company A

FY	Sales	Sales growth	EBITDA	EBITDA Margin	EBIT	EBIT Margin	Net income (NI)
	in € million	% yoy	in € million	in %	in € million	in %	in € million
2007	467.4	25%	71.5	15.3%	32.6	7.0%	31.3
2008	485.7	4%	78.6	16.2%	42.1	8.7%	41.3
2009	449.9	-7%	52.4	11.6%	-1.1	-0.2%	-5.8
2010	372.2	-17%	34.5	9.3%	-25.6	-6.9%	-37.6
2011	487.9	31%	95.9	19.7%	46.5	9.5%	35.0
2012	514.2	5%	103.4	20.1%	42.1	8.2%	26.5
2013	541.7	5%	102.4	18.9%	31.4	5.8%	14.6
2014	589.9	9%	127.2	21.6%	53.9	9.1%	38.2
2015	667.0	13%	167.6	25.1%	90.1	13.5%	69.3
2016	762.9	14%	167.5	22.0%	77.0	10.1%	56.0

Source: Company A, internal files (2016).

In 2011, Company A decided to undertake the biggest investment project in the company's history. It invested in the building of two new plants in Asia to produce leading products in the industry. Between 2011 and 2017 the total investment in these new plants will be around EUR 500 million. In line with such a big investment and constant changes, the company has to ensure that its employees can deliver continuous improvement in all areas of business – Production, R&D, Quality, Engineering, Sales and other administrative functions to provide sustainable growth and co-create the change.

One initiative which supports continuous improvement and change management is Lean Six Sigma – a method for systematically improving all processes in a company. The near-zero-defect goal is supposed to be reached by improving quality aspects and customer satisfaction through the involvement and training of each person in the company. Learning from each other, taking care of the needs of the next station and using the right tools at the right time are key Lean Six Sigma elements in Company A (Company A's Intranet 2016).

4.2 Lean Six Sigma initiative in the target company (Company A)

The initiative and overall ownership of realising the Lean Six Sigma trainings and rollouts in Company A is the responsibility of the Quality Department. As part of Lean Six Sigma training, each participant has to realise one improvement project connected to their area of responsibility in the company. One of these improvement projects is to optimise the onboarding process with informal process ownership in the Human Resources (HR) Department. A major aim is to move the onboarding process from merely the "Compliance" level – so-called Passive onboarding – to the "Connection" level[10].

Between 2015 and 2017, 350 employees of the target company will become black belt, green belt or yellow belt Lean Six Sigma certified, with 20,000 training hours to be invested. The main goal to be achieved with this programme is to enable employees and managers to make data-driven decisions. Another goal is for training about Lean Six Sigma tools and techniques to enable a mindset change and communication in a common language independently of plant, department or position (Quality Department of Company A 2015).

The programme is also supported by top management of the target company. A main expectation of the target company's CEO is to change the culture and how things are done in the company – driven by more data and facts. The requirement of the board of management of Company A is for the impact of improvement projects to be fast. The improvement projects carried out in the scope of the training programme must entail cost savings. The savings required within the first year after each Lean Six Sigma project goes live are at least EUR 100,000 (Company A CEO 2016).

In accordance with a request of Company A, we do not use real names of the employees involved, only the names of the positions they hold. The same applies to the name of the target company itself, which we have accordingly called "Company A".

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[10] See Chapter 3.1 – 4 Cs for an explanation of onboarding levels.

4.3   Onboarding process: Status before the optimisation

The onboarding process in Company A is sub-optimal – from both the efficiency and effectiveness points of view. We clustered the current status in three main groups: Definition and documentation about the process; Process performance and its quality; "Big picture" – purpose and connection with other HR/managing processes.

   1.   *Definition and documentation about the process*

Documentation about the onboarding process does not exist. Consequently, different understandings appear about the process' definition – within HR and among internal stakeholders. Employees in Company A have a different understanding of the starting and ending points of the process. Steps in the process are not clearly defined, while the inputs, outputs and responsibilities of the parties involved (hiring manager, HR, mentor, peers) are also unclear. No KPIs[11]/DPIs[12] are defined; the process owner is not known.

   2.   *Process performance and its quality*

No written governance model concerning the responsibilities of local[13] and Corporate[14] HR is available. There are no clear onboarding standards related to particular employee groups (white collar, blue collar, managers, executives). The duration of the onboarding process is not defined. The process mainly focuses on the administrative (compliance) part of onboarding.

   3.   *"Big picture" – purpose and connection with other HR/managing processes*

The first relationship which is not transparent is that between the onboarding and recruiting process – where does the recruiting process finish and where does the onboarding process start, or is the recruiting process part of onboarding? It is not defined which training activities are part of the onboarding process and where are the interfaces/segregations in relation to personnel development and other processes.

---

[11] KPI – Key Performance Indicator.

[12] DPI – Department Performance Indicator.

[13] "Local HR" applies to HR departments in subsidiaries of Company A.

[14] "Corporate HR" applies to the HR Department in the holding company (in the headquarters).

4.4   Onboarding process optimisation – DMAIC methodology

In the following sub-chapters, we present how the Lean Six Sigma methodology is used to run an improvement project. In each phase we describe some tools recommended by Lean Six Sigma that are in use in Company A with the aim to improve the efficiency and effectiveness of its onboarding process.

4.4.1   The Define Phase

In the Define Phase we set the grounds for the project's later success. In our case, we invested quite a large amount of time and energy in the Define Phase and this turned out to be a good decision. In the continuation of this sub-chapter, we present the tools we used in this phase: Order structure analysis, SIPOC process map, Voice of customer research, CTQ table, Force field analysis and Project charter.

I.   Order Structure Analysis (with ABC and XYZ analysis)

To define the business process which will be the subject of our improvement project, we first used the order structure analysis tool. As shown in Table 4.2, we initially made an overview of the major activities conducted in the department. We clustered these activities into groups of similar process variants. We added information about the frequency of this process. For each activity, we defined how much input in time (hours) is required to finish each occurrence. When we multiplied yearly occurrences by time spent per occurrence, we established how many hours per year were spent on each particular activity. The activities requiring the most input in time per year are marked "A", those requiring less time are marked "B" activities and those needing the least time are marked with "C".

We added to the order structure analysis an XYZ analysis. With "X", we label activities which occur very often, with "Y" activities which occur less often and with "Z" those activities that occur the most rarely. Activities marked with "A" and "X" must work very

optimally; therefore, we decided to select the onboarding process as the one to be the subject of our improvement project (Jöbstl and Freisinger 2015; A.M.T.successfactory and Uckert Sigma Consulting 2015b).

In addition, we asked customers which processes are not working well in the HR function and in their opinion which process has high significance, where the majority "voted" for the *onboarding process*.

When asking colleagues in the HR Department which process needed to be optimised, five out of eight employees pointed to the onboarding process.

Table 4.2: Order structure analysis

No.	Product / Service	Sub-Service	Frequency per year	Hours / occurrence	Hours per year	Proportion	ABC	XYZ
1	Onboarding	Recruiting	**70**	48	3,360	**23%**	A	X
		Onboarding - Administration	**70**	10	700	**5%**	A	X
		Onboarding - Training	**70**	100	7,000	**47%**	A	X
2	Reporting & Analysis	Monthly reporting	36	8	288	2%	B	X
		Ad-hoc queries	50	3	150	1%	B	X
		Salary Review	1	25	25	0%	C	Z
3	Performance Management	Annual Performance Reviews	1	80	80	1%	C	Z
4	Talent Management	International Talent Programme	1	1,056	1,056	7%	B	Z
		Annual Talent Review	1	300	300	2%	B	Z
5	Admin	Bonus calculation for expats	1	430	430	3%	B	Z
		Expat management	1	1,478.4	1,478	10%	B	Z
	TOTAL				**14,867**	**100%**		

As shown in the above table, onboarding is a process with a very high proportion of time/resources needed in the HR Department. Considering our customers' opinions and

those of the HR team members the onboarding process was selected as the process to be improved using the Lean Six Sigma methodology.

II.   SIPOC Process Map

A SIPOC process map gives us the first impression about the complexity of the process. We used a SIPOC process map to gain a systematic overview of suppliers, inputs, process, outputs and customers. The process only includes major process steps – the focus of this tool is not on the process but on suppliers, inputs, outputs, customers and their requirements. A more detailed process description and the whole process flow are presented in detail with the Makigami tool (Appendix D). As we can see from the SIPOC process map presented in Table 4.3., there are multiple suppliers involved in the onboarding process which, in some cases, are in the role of customers as well. We assume that the customers involved in our process have various requirements – we summarised these requirements in the last column.

Table 4.3 SIPOC Process map

Supplier	Inputs	Process	Output	Customer	optional: Customer Requirements
Job platforms	Enable job postings		Applications	Hiring manager	Right people at the right time in requested positions, productive within a reasonable timeframe
Hiring managers	Recruiting requisition		Approved recruiting requisition	Second level manager	Right people at the right time in requested positions, productive within a reasonable timeframe
HR (Local and Corporate)	Candidate pool		Rated candidate profiles	HR	To successfully collaborate with hiring manager and department manager during recruiting and onboarding process
Agencies, head-hunters or other sourcing channels	Candidates	Onboarding process	Candidate shortlist	Department managers	Right people at the right time in requested positions, productive within a reasonable timeframe
Employees	Internal applicants		Shortlist of internal applicants	HR	To successfully collaborate with hiring manager and department manager during recruiting and onboarding process
Candidates	Applications		Offer	Candidates	To be handled professionally, fair, without discrimination
Second-level managers	Requisitions/Decisions/Confirmations		Approved offer	Candidates	To be handled professionally, fair, without discrimination
Local HR	Onboarding Checklist (Administrative part)		Signed policies and formal documentation	Company, Auditors, External institutions	Services in line with the company policies and legal requirements
IT	Request for IT equipment		IT equipment	New employee	To have IT equipment with required software installed from the first working day on.

Issue recruiting requisition → Job publishing → Selection of the candidate → Offer sent - Offer accepted - Contract signed → Onboarding
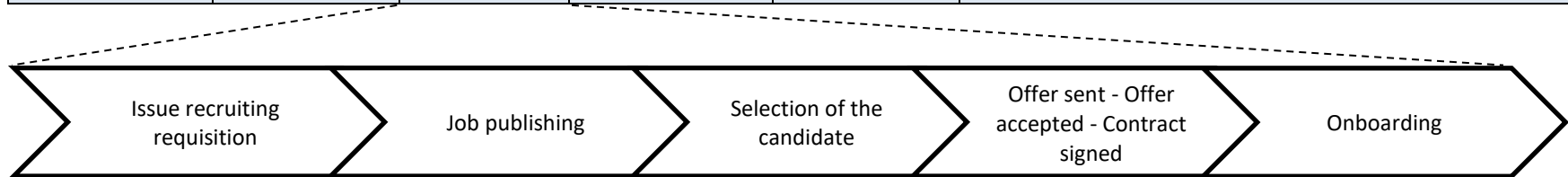
III. VOC – Voice of customers

Before starting on the process improvement, we sought feedback from our internal customers (hiring managers) about their customer satisfaction with the services provided within the onboarding process. We asked them what in their opinion works well and which services could be provided with better quality.

In Table 4.4 below, we summarise our plan made before the start of the research on how we would perform the Voice of Customer research.

Table 4.4: Voice of customer plan

WHO	WHAT & WHY
Hiring managers, department managers	We will measure customer satisfaction with the onboarding process. We ask questions related to efficiency, quality, clarity of roles, and clarity of process steps
SOURCES	
Reactive – will not be in use (do not exist)	Proactive – will be used in the VOC plan
SUMMARY	
Interviews with 8 hiring managers will be conducted. Each will evaluate the recruiting and onboarding process. 20 statements are provided. Each customer has to reply to which extent they agree or disagree with particular statements. Maximum total points per respondent can be 120. In addition, we ask our customers if one particular aspect/onboarding element is of high or low significance for them. At the end, we ask two open questions, which are optional to answer. Each interview lasts 20–30 minutes.	

In Appendix A the questionnaire used to ask hiring managers about their satisfaction with the onboarding services is attached and in Appendix B we provide a summary of the results for each question. The overall result (coefficient) – average of all the results was 4.1. After the improvement project, our goal is to achieve a minimum average score of 5 for customers' satisfaction.

In further phases of the improvement project, we especially focus on bettering elements of the onboarding process which our internal customers claim are not performed well enough, but are highly important. These elements are presented in the lower-right area of the

quadrant (Figure 4.2) – coloured red and the corresponding statements are listed in Table 4.5. In addition to improving these onboarding process elements, we wish to focus on improving the questions marked in yellow because they are near the bottom-right area of the quadrant.

Figure 4.2: VOC Matrix
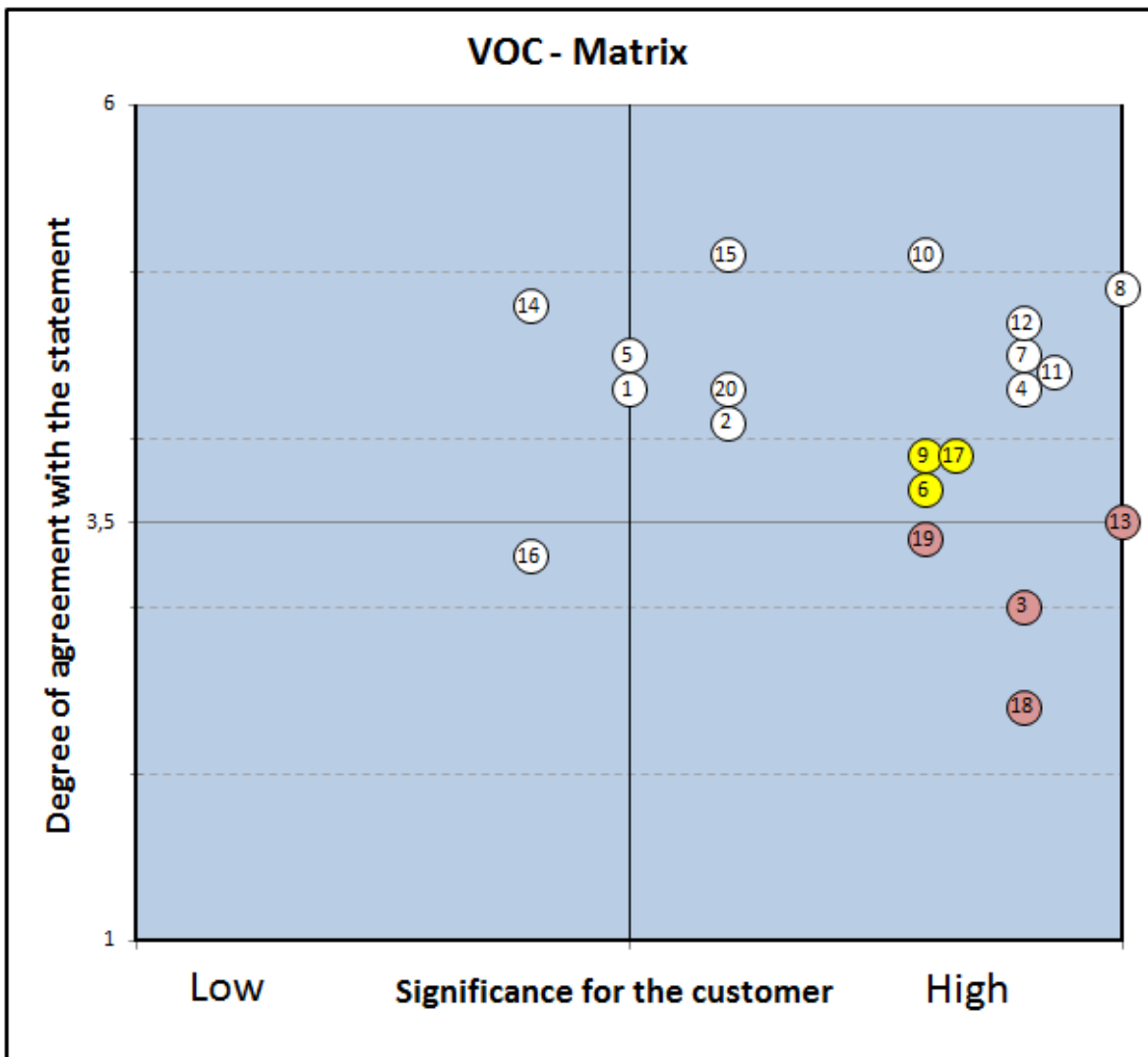
Table 4.5: Statements with high significance for customers and a low agreement rate

Statement No.	Statement
3	Preselection of candidates was already done by recruiter. I already reviewed preselected CVs
6	Services of an external agency were of good quality
9	I received useful tips from the recruiter before the interview on the interview structure (what is my role, as manager, and what is the role of the recruiter)
13	The duration of the recruiting process was acceptable to me (from recruiting requisition until the contract was signed)
17	My employee received basic training, hard and soft skills training within their first year of employment
18	HR proactively supported my new employee in getting to know the organisational environment and company culture
19	I was clear about the roles and responsibilities in the recruiting and onboarding process (it was also clear to me who is responsible for which topic within the HR Department)

IV.   CTQ – Critical to Quality

Using the Voice of customer method we gathered information about which onboarding process elements are important for our customers and which are the topics where they expect higher quality or speed of services provided by HR. For the statements located in the bottom-right part of the quadrant, we define CTQs. This means we translate the internal customers' requirements into measurable objectives. At the beginning of the improvement project, we measure the current process and compare these results with the measurement results after the improvement. We keep on using the defined measures and targets set in the Control Phase to ensure the sustainability of the process.

As we illustrated with the SIPOC process map in Table 4.3, there are various customers involved in our process. In the CTQ table (Table 4.6), we focus only on our biggest customer group, involving our internal customers – hiring managers, second-level managers and department managers – helping them to hire and onboard their new team members. For each metric established we define the targets.

Table 4.6: CTQ Table

Customer	Need (Level 1)	Need (Level 2) = Driver	Need (Level 3) = CTQ	Metric	Target
Hiring manager, department manager, second-level manager	Qualified and productive new employee for a reasonable cost in time	**Service Quality**	Preselection by recruiter	Preselection by recruiter done (YES/NO)	YES
			Matching candidates – First-year retention rate	(Number of still active new hires per month in this FY/Number of new hires in the same month in previous FY)*100	Retention rate of new hires in their first year of employment should be ≥ 90%
			Onboarding successfully done	My employee received basic training, hard and soft skills training within their first year of employment	YES
			Clear responsibilities and process steps	Onboarding process in written form – formalised and in process document database	YES
			Improve service quality	Customer satisfaction improvement: Average customer satisfaction of highly important onboarding elements	Coefficient of highly significant elements for the customers higher than 5
		Cost	Costs of external portals/search/agency	Forecast correctness = (actual costs/forecast costs)*100	80% > Forecast correctness < 120%
		Time	Time to Hire (TTH)	Number of days for recruitment = end date-start date	For Job grade 10-30: 90 days For job grade 40-60: 150 days For job grade: 70-90: 180 days

V.   Force Field analysis

In each improvement process, be it servicing internal or external customers, there are some factors (functions, individuals, external stakeholders, etc.) which drive and other factors which inhibit the process improvement. At a very early stage of the project, we brainstormed the driving and inhibiting forces for our project and how we can stimulate the driving forces to help us lead the process in the desired direction. On the other hand, we have to minimise the impact of the inhibiting forces. In Table 4.7, we list the driving and inhibiting forces and in the continuation explain how we are planning to fire-up the driving and weaken the inhibiting forces.

Table 4.7: Driving and Inhibiting Forces

Driving Forces	Inhibiting Forces
Hiring managers	Local HRs (due to resistance to change and process deviations)
IT	Excuses (time and resources)
HR team	
Top management	

It is highly important for hiring managers, HR team, top management and IT to have clear and transparent roles and responsibilities in the process. This makes the process and involvement in the process smoother and clearer. Already at the kick-off and also during the project, we especially highlighted the benefits for each stakeholder involved in the process.

We can weaken the inhibiting forces this way, namely, by including local HR departments of Company A in the project from the very beginning, while obtaining and taking into account their inputs and specific needs. Another inhibiting force may be excuses of the project team of having no time resources to actively work on the project. Therefore, we will involve the sponsor and department managers to ensure there are enough internal resources available. We will stick to the project timelines so that resources can be planned accordingly and prioritisations thus made.

VI.   Project Charter

The Project Charter is an official document created when we initiate the project. It is presented to the sponsor and steering committee – they confirm the project. It includes the most important information about the project, e.g. goals and non-goals of the project, project team, measurable objective, main milestones, etc.

In the case of Company A, we put the project charter information in the official project database where all project charters are stored. Whenever a new project is added to the project database, a confirmation workflow is triggered that requires confirmation of the project sponsor and project controller. After the project is confirmed, the information mail is sent out to all steering committee members. The project database supported by the IT system enables the tracking of confirmations, project reporting and traceability required by internal or external audits. The project database is accessible to all white-collar employees in the company and therefore offers a good level of transparency about ongoing projects, which we evaluate as very positive.

In Appendix C the project charter for the onboarding process improvement project for Company A is attached. As requested by Company A and to respect the privacy of personal data, we do not list the names of project team members, only their titles/functions.

4.4.2 Measure Phase

The central tool used in the Measure Phase of our project is Makigami process mapping. When analysing the process steps, we identified the most time-consuming parts of the process. For those steps, we performed a deep-dive analysis to identify which activities in the process steps require the greatest time input. In the appendixes we present the Makigami process map (Appendix D) and the activity structure analysis (Appendix E) of our project.

Unfortunately, before we started the improvement project there were hardly any data or reports about the onboarding process. All data for the analysis will be gathered in the Measure Phase within the scope of the improvement project.

I. Makigami process map

We used a Makigami process map to define the sequence of process steps in our selected process. For each process step, we added information about who (position or function in the company) is executing each particular process step (Marked "E" in Makigami), who is cooperating (C), who is informed about the process step (I) and who is a decision-maker in the process step (D). Further, we added information about the data carriers or information media used in each step. We estimated how much time input is needed for each particular process step and divided these times into value-adding and non-value-adding activities. By doing so, we gathered the first estimations of the most time-consuming process steps.

For each process step we listed the problems (see Appendix D[15] – Part 2, red area) which occur as a consequence of unclear roles and responsibilities, unstandardised communication, absence of policies, etc. For each problem we offered solutions (see Appendix D – Part 2, green area). We already apply some solutions within the scope of our improvement project.

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[15] The purpose of Appendix D – Part 2 is to show the structure of Makigami. As per the guidelines of Company A, the content cannot be disclosed and published as the presented solutions are a business secret. Therefore, we intentionally used small text fonts.

Our experience shows that making a good Makigami process map is very complex and time-consuming. In any case, the benefit of a well-prepared Makigami process map pays out in later stages of the project. In our case, we added some non-standard elements for Makigami into the process maps so our outcome was that we obtained the first overview of the process, the functions involved, the time input required and communication media used. We first detected waste and non-value-adding activities.

In our case, the Makigami process map was built during five iterations of workshops with employees involved in the process. Our experience demonstrates that adding information to Makigami in more iterations is very beneficial as ideas "grow" through the time and at each workshop new information is added and new solutions are proposed.

A detailed Makigami map provides the improvement project's project manager with valuable information to give the basis for the next phases of the DMAIC process.

In Appendix D we present the Makigami process map of our process. In the first part, we picture who is responsible for a particular process step (D, E, I, C). In the second part, we briefly show the lower part of the Makigami map where information media, duration times, problems and potential solutions are proposed. Due to the need to respect the wishes of Company A, we cannot disclose the details of this part of the map.

II.   Activity structure analysis

With the help of the Makigami map, we decided which process steps to measure with the activity structure analysis. We chose the following process steps*: 2 – Align content information needed to create recruitment requisition; 6 – Set up and text posting aligned with hiring managers* and *9 – Preselection and candidate rating of internal/external candidate profiles, assign/send suitable profiles to Hiring Manager.*

The main reasons for undertaking a deeper analysis of these process steps are: the roles and responsibilities are unclear; the process step is time-consuming, complex and includes many sub-activities.

We measured the activity times of people involved for a period of 40 days. In Appendix E we present the results of our measurement.

We derived two important lessons while performing the activity structure analysis. The first is that estimations of the time needed (in our case presented in the Makigami map) for particular steps can vary significantly from real measurements using activity structure analysis. The actual amounts of time needed for a particular process step exceed the estimated values by up to 500%. Here, the lean principle which gives preference to real measurements over estimations and "gut feeling" shows its sense and value.

Another lesson we derived from using the activity structure analysis is that very clear information on how to conduct the measurements must be provided to employees who are to write their activity times down. In addition, our experience shows that it is better if activities within process steps are written down before the time measurements start so that every day only the time inputs have to be added. It is also necessary to define the scope of the measurements: Is the measurement for all currently open positions, only for a few selected ones or for just one open position? In our case, some of these clarifications were not made before the measurements started, with the outputs after first review showing that data consolidation of the daily time sheets would be impossible so the measurements had to be restarted. Using Lean Six Sigma terminology, the first measurement was a *waste*.

III.   Process costing

We can calculate the process costs of those parts of the process where we measured the activity times. To do so, we require two additional parameters. First, we need to calculate the productive hourly rate of the person/people involved in the process. Second, we need information about the probability a particular activity will happen in the process step.

In our case, productive hourly rates were calculated by the controlling department and given to us. The measured activity times and probabilities were provided by the person carrying out the self-measurement. With all this information we were able to calculate the costs of three selected process steps selected using the following formula:

$$\text{Process Cost} = \text{Duration (h)} \times \text{Probability (\%)} \times \text{hourly rate (EUR/h)}$$

The result of using this formula in our case is: Process costs for the three selected process steps per position are EUR 1,291.00 when considering only the costs of the recruiter, excluding the hiring manager's efforts (and related costs) which we do not present in this thesis.

Based on estimations of the activity times in the Makigami map we can roughly evaluate internal manpower costs. To illustrate the calculation procedure, we present an example of calculating the recruiting costs with activity costs estimated in the Makigami map (process steps 1–21) in Table 4.8.

Table 4.8: Manpower Costs – Example of the recruiting part of onboarding

A	B	C	D	E	F
Minutes per position	Hours per Position	Productive Hourly rate (EUR)	Internal manpower cost per position (EUR)	Average number of positions Per year	Yearly costs of internal manpower (EUR)
4,268	71.13	70	4,979.10	52	258,913.20

To identify the exact internal costs of the whole onboarding process time, measurements for all process steps must be performed. At the time of writing this thesis, the measurements were underway (separately for all parties involved). For the process cost calculation actual measurements of activity costs are required. When we conduct Lean Six Sigma projects estimations are insufficient (Jöbstl and Freisinger 2016).

4.4.3 Analyse Phase

When writing this thesis the Measure Phase had mainly been finished. In this chapter, we present some tools already employed in the project which are typically recommended by Lean Six Sigma for use in the Analyse Phase.

I.   Muda hunt checklist

A Muda hunt checklist is a systematic way to detect and cluster waste in waste categories. In our case, we already dealt with waste detection while creating the Makigami process map.

We used the Muda hunt checklist in the Analyse Phase to make a complete list of waste and to classify it in categories. The outcome of the Muda hunt checklist shows that in our process the biggest amount of waste is in the "failures and loops" cluster and no waste was detected in the Muda category "overproduction". The Muda hunt checklist is presented in Appendix F.

If waste has not already been detected in earlier stages of a project, a Muda hunt checklist can also be a good brainstorming method to detect waste.

II.   Ishikawa diagram and Mind map

In the Measure Phase we collected data about the process. The purpose of the Analyse Phase is to systematically interpret these data so that, on one hand, we can understand the behaviour of the current system and, on the other, we can implement sustainable improvements in the Improve Phase.

In the Analyse Phase we also focus on understanding the root cause of the problems we listed in the Makigami process map. As brainstorming tools to detect all possible root causes of the problems within our process, we used a *Cause-effect diagram (Ishikawa)* and a *Mind map*.

With the Ishikawa diagram we performed team brainstorming to find possible reasons for "*Why is it hard to find matching candidates for some open positions?*". To define which problems we face when preparing job offers we were brainstorming about the question: "*Which issues do we face when preparing a legally binding offer/contract*?". For this purpose we used a Mind map.

In our case, at a workshop we used flip charts to note down all possible reasons mentioned by the team members. Only after the workshop we prepared electronic versions of the Ishikawa diagram and the Mind map. We found this approach much better than creating electronic versions already during the workshop because we could be faster in writing down all possible causes mentioned by team members and did not lose time, track or creativity flow due to possible technical issues with the electronic tools.

In our experience, both tools can be used in any phase of DMAIC projects and also in the day-to-day working environment. With these tools, creative ideas can be generated and innovative solutions can be found. It is important to add that at the beginning of any creativity/brainstorming workshops we reminded the participants about the need to accept with an open mind the opinions of others and that no bad ideas/proposals exist.

4.4.4 Improve Phase

I.   Description of the future process

The initial step in Improve Phase is the creation of a clear process flow and formalisation of the process. First, the new process flow will be uploaded for internal confirmation of the workflow of Company A. After it is confirmed by all relevant reviewers, it will be uploaded to a database of official process documentation. In Company A, confirmation of the process description uploaded to this database makes the process valid and formal. This is the first prerequisite for a common understanding of the process within the organisation. To draw the process flow we will use the IT tool MS Visio.

In addition, we will also make an easy-to-read presentation of the process flow for the customers. This presentation will be a simplified version of the above-mentioned process flow, which will be easily accessible for everybody involved in the process. We decided to do this due to issues found in the Measure Phase (Makigami) which cause a lot of waste – unclear roles and responsibilities. In this presentation, all process steps with responsible people will be listed.

In the Improve Phase, we will also implement smaller changes (see the activity list in Appendix I) and realise the solutions defined in the Makigami map.

II.   Poka yoke

The goal of introducing Poka yoke elements to the process is to achieve clear communication whereby the receiver does not have to return questions to understand the message of the messenger.

The outcome of the Makigami map showed that many communication loops happen in the onboarding process. Consequently, much waste is produced. Many failures in message transfers or requests happen between people involved in the process. The process analysis showed that communication in the process is not standardised in terms of data carriers nor the content of the message. For process steps where standardised communication is

possible, we made templates and forms which can be filled in and transferred to the next step in the process, always in the same form and including the same structure of content.

III. 5S

With the 5S principles we will not only consider the renewal of the onboarding process in Company A but in the department in general. In the HR Department of Company A employees face some issues and conduct wasteful activities due to not following the 5S rules. Currently, there is a lot of material in physical and electronic form which is not needed by anyone. Existing documents are not set in order and various systems on how to set things in order exist. There are no common standards about how to store and maintain documentation.

We will introduce the 5S principles, starting with a short training for all HR employees. We will invite a Lean Six Sigma trainer – Master Black Belt, to present the team the 5S principles and propose step-by-step activities to come to a 5S arrangement in the department. Afterwards, on a "cleaning up day", all paper documents will be reviewed and put in order. Unnecessary documentation will be discarded, items needed for evidence reasons will be stored in archive and documents still needed for everyday activities will be set in order in the office.

At the end, the team will agree and formalise the standards of ordering electronic and paper documents and follow these rules to sustain the 5S setup.

4.4.5 Control Phase

As explained in the theoretical part of this paper, the purpose of the Control Phase is to ensure a sustainable process after the improvement. We will measure process stability and introduce the KPIs[16] listed in our CTQ table (see Table 4.6). The processes will be handed over from the project manager to the process owner. Although the team was involved and trained already during the improvement project, in the Control Phase additional training will take place. Such trainings will especially apply to process control – how to measure, interpret and report all KPIs set in the Define Phase (see Table 4.6 – CTQ table). We will measure the *retention rate of new hires in their first year of employment*. With this KPI, we will measure the quality of the selection process. The assumption related to this measurement is that candidates who stay with the company in their first year of employment are a result of a good quality recruitment process. We will present the data using pie charts.

A KPI especially measuring the quality of the onboarding process in the eyes of the customers (hiring managers) will be *customer satisfaction*. We will use the same questionnaire that we used for the Voice of Customer research (see Appendix A). We will measure customer satisfaction on a yearly basis and our target is to keep the overall customer satisfaction rating for elements which are highly important for our customers above the scale (coefficient) of 5. The data presentation will employ a VOC Matrix as shown in Figure 4.2.

The voice of customer research showed that in some cases actual external costs (e.g. costs of head-hunters, agencies, external job posting platforms, etc.) in the recruiting process do not match the forecast costs. That is why we will introduce a KPI which will measure if any *gaps between the forecast and actual external costs* exist. The target is that actual external cost must be between 80% and 120% of external costs. To present the results we will use control charts.

With another KPI which applies to the recruiting part of the onboarding process we will measure how fast we get new employees on board. We will measure *time to hire* – how

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[16] KPIs – Key performance indicators.

many days pass between the start and end date of recruiting[17]. The targets are presented in Table 4.6, and vary depending on which level of position we are recruiting (targets for recruiting higher level positions entail more days). We will present the data with stacked bar charts.

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[17] Recruiting is a part of onboarding process. It starts with submitting recruiting requisition and finishes when candidate accepts the offer.

5 CONCLUSION

To gain or keep a competitive advantage in today's global market it is crucial to know what the development trends of a business are and to have good "radars" concerning what the future will bring. Being prepared for the future from the processes, innovation and technology points of view is critical to the success of companies. It is not enough to be "on the prowl" but also to be fast in adjusting. Huge potential lies in asking: *"Why do we do it this way?"*.

In this thesis we described one of the top-down business improvement strategies, Lean Six Sigma. In the first part, we outlined the basics of Lean and Six Sigma as separate approaches to process improvement. Generally speaking, *Lean* focuses on speed and efficiency. It suggests eliminating waste and reducing non-value-adding activities. On the other hand, the focus of *Six Sigma* is on quality and effectiveness. Six Sigma is a statistical approach which promotes data-driven decisions. Outputs of the Six Sigma process are consistent. Every improvement project has to bring measurable financial results.

In the continuation of the paper we explained the fusion of the two methodologies to form *Lean Six Sigma*. Many limitations of Lean or Six Sigma as "standalone" approaches no longer apply when both approaches are used side by side.

The structures of both parts of the thesis, theoretical and empirical, follow the DMAIC project methodology. We pointed out the main purpose of each DMAIC phase and in the empirical part we presented and reflected on tools used while implementing the improvement project. The project presented in this paper was an onboarding process improvement for Company A. When employing the Lean Six Sigma tools and methods we experienced that its usage is also very simple and efficient in services. We only faced some difficulties because no data were available about the process before starting the project; therefore our Measure Phase was quite time consuming. Not having much existing data is quite a common issue when Lean Six Sigma is used for services. Unlike in manufacturing environments, when implementing improvement projects in services we turn the focus slightly more to the *lean* part of Lean Six Sigma (Jöbstl and Freisinger 2016). Therefore, we move to the Improve Phase relatively quickly compared to process improvements in a

manufacturing environment. In addition, it is recommended to implement some quick wins already before the Improve Phase so as to engage the team in the project.

In the empirical part of this thesis, we presented the onboarding process as an improvement project in Company A. At the beginning of the project, in the *Define Phase* we asked our internal customers about their business needs relating to the onboarding process. To satisfy these needs, we translated their requests and priorities into measurable targets. In the *Measure Phase,* we obtained a clear picture of the "as-is" process and discovered major issues concerning the process. We analysed the problems to understand the causes of the current process performance in the *Analyse Phase*. In the *Improve Phase,* we will create an implementation plan for improvement and define the "to-be" process. In the *Control Phase,* we will keep on ensuring the improved process' sustainability using metrics to measure the improved process performance.

Currently, we are implementing the quick wins listed in Appendix I. After we receive the measurements of actual activity times of all process steps in the onboarding process, we will calculate the process costs. After six months from the date of the project going live, we will conduct the same measurements again to see if we have achieved the planned level of savings (25% lower internal process costs and 20% lower external costs). Further, in the Control Phase we will measure all other KPIs as defined in the CTQ table.

5.1 Lessons learnt in the improvement project and limitations of the Lean Six Sigma approach

While performing our improvement project we gathered some valuable lessons. The first is that optimisation projects might in some cases be connected with employees' fears, who may start wondering about questions like: "Why are they measuring us?", "What are we doing wrong?", "What does the cost cutting mean for me?", "What is the 'master plan' behind all these activities?" and similar. This especially happens in organisational environments where the *organisational culture* is not ready to perform these sorts of projects. Managing *operational and cultural change* in such environments can be very

challenging. In these circumstances, even more intensive *communication* top down and within the project team is crucial.

Another lesson is that we should not forget that our project team involves different personalities, each with their own needs, fears and problems. We should keep the *flexibility* and use *common sense* when adjusting Lean Six Sigma to an organisational environment and to the people involved in a project.

We also learned that the main prerequisite for success in a Lean Six Sigma project is the strong *support and commitment of the top management and department managers* of the departments to which the projects apply. If managers are not open to adjust their leadership to new top-down business strategies like Lean Six Sigma, they cannot actively support and empower teams performing improvement projects. In this case, improvement projects cannot be as successful – it is even possible they will fail.

From the outset of a project on we have to ensure that enough *resources* are available, with this applying to the project manager and to the team members. In the event we are lacking resources for the project its quality can become questionable.

The last lesson to be mentioned is the *gap between self-perception* about our services *and the perception of others*. Thus, it is essential to ask our customers, be they external or internal, of their opinion on the current process and to involve them in process improvement projects.

As already mentioned in this chapter, many limitations of Lean and Six Sigma are no longer applicable when we combine them within the Lean Six Sigma approach. From our point of view, we experienced few imperfections of Lean Six Sigma. The first is that the projects are long lasting, especially if no data about the process are available before starting the project. Another limitation is that we can measure the success of an improvement project only after some time the project was implemented. As our own experience shows, some "ethical" questions also appeared when we started measuring the process – some employees reproached us, claiming that Lean Six Sigma intends to robotise people's interactions and is inappropriate for use in services, especially not in HR. In any event, we

see these reproaches more as an issue of corporate culture, a lack of trust and insufficient communication about ongoing improvement projects.

5.2 Recommendation for Company A

Our first recommendation for Company A is to adjust to demographic changes in the human capital market. The population of millennials[18] in the job market is rapidly growing. This generation has different requirements and preferences concerning working environments than previous generations. They value flexibility in working style and working hours, mobility, while identification with the product is very important. They do not value complex hierarchies and complicated decision processes, but move fast towards results. In general, millennials want to make a difference (Gursoy et al. 2013). They appreciate constant feedback; therefore, Company A should also reconsider the frequency of annual performance reviews (currently on a yearly basis).

The number of millennials in the job market will grow in the next few years. Due to millennials' different preferences for their working environment, we suggest that Company A puts a stronger focus on considering the needs of this group of employees when adjusting the onboarding process. This especially includes attracting and engaging millennials and therefore millennials-targeted recruiting marketing and employer branding must be established. Information about the company should be communicated via e-lessons and videos; (mobile) technology plays a crucial role (Brack 2012). Within the first weeks of their employment, it must be clearly communicated how a new employee can grow and develop potential. Millennials appreciate a relaxed and flexible organisational culture which supports open communication and transparency. It is vital to create a wow-effect and make their first day and week in the company fun and memorable. Company A should avoid delivering too much formal documentation about processes, rules, procedures and policies to read on the first working day or week. The information which needs to be transported to the newcomer should be transferred in a concise way using IT solutions (e.g. e-learning). Further, experts from different areas in the company who can provide

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[18] The generation born between 1980 and 2000.

additional explanations should be involved if needed. Some companies also adopt an approach where they send some documentation or e-lessons to the newcomer already before their first working day so they can already start to gather important inside information about the company (e.g. a list of questions most frequently asked by new employees and answers to them).

Another recommendation for improving the onboarding process is to focus on stressing the individual identity of new employees rather than on how people can adjust to the organisational environment. Cable (Cable et al. 2013, 23) states that "by encouraging new employees to apply their personal strengths to the job, companies can help their new hires to become more connected with their colleagues, more engaged in their work and more likely to stay" with the company. This approach encourages *personal identity socialisation* which involves encouraging newcomers to express their unique perspectives and strengths on the job and to frame their work as a platform for doing what they do best (Cable et al. 2013). The organisation should identify a newcomer's capabilities and strengths and assign tasks in the department accordingly. A good tool to use is order structure analysis which can be done periodically (every six months, every year or when new employees join the team). When assigning tasks, it is good if a manager combines their knowledge and experience with the tests and tools which measure the strengths, values, motivation, behaviour and competencies of the team members (e.g. INSIGHTS MDI, SDI and similar).

As Company A is a production company it is highly important that an onboarding process for blue-collar workers is also in place. In these cases, the direct supervisor plays a crucial role. In any event, HR should provide the guidelines and steer the onboarding process of new employees. Tools, clear communication of responsibilities and support should be offered by the HR Department, although the majority of activities are performed within each department that welcomes a new employee. Some degree of flexibility to adjust the onboarding process within each department should exist as each new employee requires a personalised management style. On the other hand, executive onboarding (onboarding process for employees in top management positions) also requires special attention and a unique approach. One reason is that personnel changes at the highest level of the organisation are expensive. Another reason has a qualitative note – top managers are the

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biggest influencers of the organisational culture which is transferred top down, therefore frequent changes do not positively affect the organisational stability.

Company A should always follow new trends and adjust its onboarding strategies to changed circumstances. The improved process should not stay the same for years but be constantly altered and adjusted to ensure continuous improvement and a competitive advantage against competitors. A good quality, well-planned and impressive onboarding process contributes highly to a good employer brand.

We would like to highlight two more recommendations that apply especially to the Lean Six Sigma initiative in Company A. During the analysis we found that the HR Department is not involved in executing the Lean Six Sigma initiative. The whole Lean Six Sigma programme is led solely by the Quality Department. Consequently, Company A cannot benefit from some of the aspects that HR involvement can bring (see Chapter 1.4). It is positive that the HR Department is actively participating in the initiative with the business process improvement from the HR area (the onboarding process improvement presented in this paper), but more cooperation with Quality Department in running the whole initiative is suggested.

Another suggestion for Company A when implementing new processes is to use Lean Six Sigma elements already when setting up new processes and not only when improving processes.

6 SUMMARY OF THE THESIS IN THE SLOVENIAN LANGUAGE / POVZETEK DIPLOMSKEGA DELA V SLOVENSKEM JEZIKU

Ker se dandanes konkurenčni trg sooča z vse hitrejšimi spremembami, je za podjetja zelo pomembno, da načrtujejo in spremljajo svojo učinkovitost. V uspešnih podjetjih kritično opazovanje učinkovitosti notranjih procesov in hitro prilagajanje tržnim trendom predstavlja del vsakodnevnih aktivnosti, in sicer ne le za vodstvo podjetja, temveč tudi za vsakega zaposlenega znotraj njegovega področja odgovornosti. Nove tehnologije prinašajo nove možnosti za dobavo storitev in lahko zagotavljajo podporo za storitve na daljavo, nekatere izmed njih pa je celo mogoče v celoti prenesti na zunanje ekipe (»outsourcing«). Ker storitvena mreža postaja vse bolj in bolj zapletena in običajno obsega razmeroma visok delež vseh kadrovskih stroškov je izjemno pomembno, da ljudje, ki sodelujejo v tovrstnih procesih, ravnajo oz. delujejo »pametno«.

Predvsem v podjetjih s slabše razvito organizacijsko kulturo obstajajo nekakšni »črni seznami« procesov ali funkcij, ki ne ponujajo dovolj dobre kakovosti storitev. Kakorkoli že, navajanje, da nekateri procesi ne delujejo optimalno zgolj na podlagi predpostavk, »občutka v želodcu« ali metode »od ust do ust«, ne predstavlja dovolj objektivnih argumentov in je povsem v nasprotju s teorijo Lean Six Sigma (vitka 6-sigma) in načeli, ki jih preučuje ta dokument. Ena izmed glavnih zahtev teorije Lean Six Sigma namreč pravi, da mora biti vsaka poslovna odločitev osnovana na dejstvih in številkah.

Na področju storitev izraz "stranke" lahko pomeni bodisi zunanje stranke (na primer v zdravstvu, bančništvu ali vladi) bodisi notranje stranke, tj. v primeru, kadar en oddelek za storitve podpira oziroma oskrbuje druge oddelke znotraj določenega podjetja (na primer notranji oddelek za informacijsko tehnologijo, oddelek za finance, kadrovski oddelki itd.). Razlog, zakaj so bile metodologije Lean Six Sigme vpeljane tudi na področje storitev se skriva v dejstvu, da so raziskave pokazale, da je kar 50 % celotnih stroškov storitev sestavljenih iz dela, ki pa v očeh strank ne prispeva nikakršne vrednosti (George 2003). Drugi izmed razlogov je, da je v storitvah še vedno uporabljenih premalo podatkov in procesnega razmišljanja, ki ga spodbujajo in zahtevajo izvedbe teorije Lean Six Sigma. Z uporabo široke palete sistemov informacijske tehnologije na področju storitev, je danes na

voljo veliko več podatkov, kot pred desetletjem oziroma dvema. Čeprav so podatki dandanes na voljo v veliko večjem obsegu, pa storitvenim funkcijam še vedno primanjkuje pripravljenosti in znanja za analizo številk.

OPREDELITEV LEAN SIX SIGME

Ta diplomska naloga opisuje eno izmed *strategij za izboljšanje poslovanja*, Lean Six Sigmo. Lean Six Sigma, ki je bila sprva uvedena na področjih proizvodnih dejavnosti, je po eni strani dajala poseben poudarek na krajše dobavne roke, manjšo količino nepotrebnih aktivnosti v procesu, najoptimalnejšo porabo materiala ter prilagodljivost in kakovost, po drugi strani pa tudi na ohranjanje visoke ravni točnosti in natančnosti. Obe filozofiji strategije Lean Six Sigma (Lean Management in Six Sigma – Vitko upravljanje in Šest Sigma) štejeta osredotočenost na kupca za najpomembnejši dejavnik uspešnosti pri upravljanju procesov. Lean Six Sigma je *poslovna strategija*, ki obsega metodologijo za izboljšanje uspešnosti procesov, prav tako pa povečuje zadovoljstvo strank in pripomore k večji stroškovni učinkovitosti procesov (Snee 2010). Nekateri avtorji (Welch v Snee 2010) še menijo, da je strategija Lean Six Sigma tudi dobro *vodstveno orodje in orodje za razvoj kadrov*.

Na splošno gledano, se pristop »*Lean*« osredotoča predvsem na hitrost in učinkovitost ter predlaga odpravo nepotrebnih aktivnosti (ang. waste) in zmanjšanje količine tistih dejavnosti, ki ne dodajajo nobene vrednosti, a so po navadi v procesu vseeno potrebne. George (George 2003a) še navaja, da pristop »*Lean*« opredeljuje neučinkovitosti in nepotrebne aktivnosti v vseh postopkih, najsi bo to na področju proizvodnje ali na področju storitev, in se osredotoča predvsem na hitrost, prilagodljivost in kakovost. Zagotavlja tudi nemoten in neprekinjen potek procesa in daje poudarek le na stvari, ki so pomembne za stranko. Po drugi strani pa se pristop »*Six Sigma*« osredotoča na kakovost in učinkovitost. Lahko rečemo, da »Six Sigma« obsega statistični pristop, ki spodbuja odločitve na podlagi podatkov. Rezultati procesa Six Sigma so konsistentni, prav vsak projekt za izboljšanje pa mora prinesti merljive finančne rezultate. Poleg že omenjenega, se »Six Sigma« osredotoča tudi na točnost in natančnost ter poudarja zlasti postopke oziroma dejavnosti, ki so kritični dejavniki kakovosti in z zmanjševanjem variabilnosti skrbi za zmanjševanje stroškov.

Zagotavlja tudi, da so za izboljšave procesov s pomočjo pristopa »Six Sigma« izbrani strateško pomembni projekti. (Arnheiter in Maleyeff v Manville in drugi 2012, 11).

LEAN SIX SIGMA IN NJENA POVEZANOST S FUNKCIJO KADROVSKAGA MANANGEMENTA V PODJETJIH

Lean Six Sigma ni le metoda, ki narekuje, kako voditi projekte za izboljšanje procesov, temveč vključuje tudi številne elemente človeške plati vodenja poslovnih izboljšav. Upravljanje ljudi, soustvarjanje organizacijske kulture, vodenje, razvoj ljudi, mentorstvo, usposabljanje in upravljanje sprememb, predstavljajo le nekatera izmed področij, kjer se kažejo močne povezave med pobudami Lean Six Sigme in funkcijo upravljanja kadrov v podjetjih. To poglavje zato na kratko povzema nekaj dejavnosti kadrovske funkcije, ki podpirajo uspeh projektov Lean Six Sigma.

Kadrovsko službo je treba vključiti že na samem začetku projekta. Vse skupaj se prične z izbiro ljudi, ki bodo sodelovali pri spodbujanju in implmentiranju projektov s pomočjo Lean Six Sigme. Sodelujoči zaposleni morajo posedovati dobre vodstvene sposobnosti in sposobnosti vodenja ekip ter imeti dovolj vsebinskega znanja s svojega področja odgovornosti. V literaturi lahko najdemo kontrolne sezname o zahtevanih tehničnih, vodstvenih in drugih sposobnostih, ki jih morajo imeti zaposleni, da lahko začnejo z izobraževanjem o Lean Six Sigmi. Glede na to, da vsi sodelujoči nimajo enakega izhodišča upoštevajoč njihove izkušnje, znanja in osebnostne značilnosti, mora kadrovski oddelek zagotoviti, da so projektni vodje deležni ustreznih usposabljanj o timskem delu, obvladovanju konfliktov, komuniciranju, ravnanju s težavnimi člani skupine itd. Po drugi strani pa mora oddelek za človeške vire poskrbeti tudi za dobro donosnost naložb (ROI)[19] v človeški kapital.

Pri oblikovanju delovnih timov mora kadrovski oddelek poskrbeti tudi za zadržanje talentov, ki sodelujejo pri Lean Six Sigma projektih, da ti ne zapustijo podjetja. Poleg

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[19] Donosnost naložbe. Donosnost naložbe je merilo uspešnosti, ki se uporablja za oceno oz. vrednotenje učinkovitosti naložbe.

razvojnih možnosti, jasnih kariernih poti in podpornega okolja, je odgovornost kadrovske funkcije v podjetju tudi prilagoditev sistema nagrajevanja, ki deluje v prid Lean Six Sigmi.

Naslednje področje, kjer je potrebna podpora kadrovskih oddelkov, je upravljanje sprememb in komunikacija, ki daje poudarek na človeško plat Lean Six Sigme. Kadrovski strokovnjaki morajo biti aktivno vključeni v sporočanje vrednosti, ki izvira iz novih načinov dela. V tem smislu kadrovski strokovnjaki aktivno soustvarjajo kulturo Lean Six Sigme v organizaciji – kulturo, ki je osnovana na podatkih, je proaktivna in usmerjena na kupce. Po drugi strani kadrovske službe vodstvu in ekipam Lean Six Sigme intenzivno pomagajo opredeliti elemente organizacijske kulture, ki »ovirajo« doseganje ciljev Lean Six Sigme in pomagajo omiliti njihove vplive.

Kadrovski oddelki lahko uspešno prispevajo k izvedbam Lean Six Sigma le takrat, ko imajo osnovno znanje o orodjih, ki jih narekuje Lean Six Sigma in ko poznajo terminologijo povezano s tem pristopom. Poleg tega je priporočljivo, da kadrovska funkcija v podjetju deluje kot vzor in je ena izmed prvih funkcij, ki se poslužuje uporabe metodologije Lean Six Sigma za izboljšanje procesov v oddelku. Na ta način bodo kadrovski oddelki dosegli odličnost pri zagotavljanju procesov, zmanjšali napake in pridobili kredibilnost v zvezi z vprašanji, ki so povezana z Lean Six Sigmo.

CILJI

Glavni cilj te diplomske naloge je predstaviti metodologijo Lean Six Sigma v okviru storitvenega poslovnega okolja in pokazati njeno praktično uporabo na primeru, ki izhaja iz dejanskega poslovnega okolja in s tem pomagati podjetju A narediti njegov proces »onboardinga« (selekcija, izbor in vpeljevanje novih zaposlenih) bolj učinkovit in uspešen. Prav tako želimo izboljšati kakovost storitev in zmanjšati stroške procesa (zmanjšanje internih stroškov za 25 % in zmanjšanje zunanjih stroškov za 20 %).

S to diplomsko nalogo spodbujamo idejo, da bi se odločitve, ki so osnovane na podatkih, sprejemale tudi na področju storitvenih dejavnosti. Za naše glavno raziskovalno vprašanje smo tako določili sledeče vprašanje: *Ali je metode Lean Six Sigme mogoče uporabiti tudi na področju storitev? In če da, kako?* Naš cilj je dokazati resničnost trditve, ki pravi, da

metodologije Lean Six Sigma ni mogoče uporabiti le v proizvodnji, temveč je ta odlična tudi za uporabo v storitvenih dejavnostih.

TEORETIČNI DEL DIPLOMSKE NALOGE

V teoretičnem delu diplomske naloge najprej podajamo glavne opredelitve izrazov "Lean" in "Six Sigma" ločeno, v nadaljevanju pa ponujamo razlago o tem, kako se ti metodologiji združujeta skupaj v "Lean Six Sigma" in kakšni so skupni temelji tega edinstvenega pristopa k izboljševanju procesov.

Nadaljnja zgradba teoretičnega dela diplomske naloge sledi modelu DMAIC (*ang. Define-Measure-Analyze-Improve-Control*; v prevodu: »Opredeli-Izmeri-Analiziraj-Izboljšaj-Nadziraj«), ki se uporablja pri izboljšavah procesov s pomočjo Lean Six Sigme. Na začetku opisa vsake faze bomo na kratko pojasnili, kakšen je namen te faze, katere so glavne dejavnosti v okviru določene faze in katera orodja metodologije Lean Six Sigma so najpogosteje uporabljena v vsaki izmed faz. V vsaki fazi smo izbrali tudi nekaj orodij, ki jih nato v nadaljevanju podrobneje pojasnjujemo.

Tretji del prvega, teoretičnega dela, je opredelitev procesa "onboardinga". Ta vsebina je vključena v teoretični del z namenom zagotoviti bralcu osnovo za boljše razumevanje empiričnega dela diplomske naloge. Proces "onboardinga" je v teoretičnem delu obravnavan ločeno, saj je razumevanje procesa "onboardinga" zelo različno, mi pa smo želeli biti usklajeni s svojimi bralci in jim pomagati do enakega razumevanja izraza »onboarding« pred prehodom na drugi, empirični del diplomske naloge.

EMPIRIČNI DEL DIPLOMSKE NALOGE

Za ohranitev ali pridobitev konkurenčne prednosti na današnjem globalnem trgu je pomembno vedeti, kakšni so razvojni trendi naše dejavnosti in imeti dobre "radarje" o tem, kaj natanko nam prinaša prihodnost. Ključnega pomena za uspeh podjetij predstavlja njihova pripravljenost na prihodnost z vidika procesov, inovacij in tehnologije. Ne zadošča le dejstvo, da je podjetje stalno "na preži", temveč mora biti to sposobno tudi hitrega

prilagajanja. V vprašanju: *"Zakaj stvari delamo na takšen način?"* se skriva velik potencial podjetij.

V empiričnem delu diplomske naloge smo na praktičnem primeru uporabili teoretične ugotovitve in znanja. Izboljšali smo enega izmed obstoječih procesov v podjetju A[20], ki trenutno ne deluje dobro, in sicer proces "onboardinga", ki je v (neformalni) odgovornosti oddelka za kadrovski management na sedežu multinacionalnega podjetja. Pri tem smo se poslužili uporabe enakega pristopa, kot v primeru teoretičnega dela – projekt za izboljšanje je predstavljen s fazami DMAIC, pri čemer smo začeli s fazo *Opredeli* in končali s fazo *Nadziraj*.

Pri uporabi orodij in metod Lean Six Sigma smo izkusili, da je njihova uporaba povsem enostavna in učinkovita tudi na področju storitev. Na nekaj težav smo naleteli le zaradi dejstva, da pred samim začetkom projekta nismo imeli na voljo že obstoječih podatkov o procesu, zaradi česar je bila naša faza *»izmeri«* dokaj zamudna. Takšno pomanjkanje že obstoječih podatkov sicer predstavlja razmeroma pogosto težavo pri uporabi Lean Six Sigme na področju storitev. V nasprotju s proizvodnimi okolji, se pri uvajanju projektov za izboljšave na področju storitev po navadi namreč nekoliko bolj osredotočamo na *»Lean«* del Lean Six Sigme (Jöbstl and Freisinger 2016).

Naš projekt začenjamo s fazo *»opredeli«*. Ena izmed dejavnosti v tej fazi je raziskava imenovana »glas strank«. Na ta način prejmemo prve povratne informacije o tem, kako naše interne stranke (v tem primeru vodje oddelkov, ki iščejo ali uvajajo nove sodelavce) zaznavajo kakovost storitev kadrovskega oddelka v zvezi s procesom »onboardinga«. Na

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[20] Podjetje A je multinacionalno podjetje s sedežem v Srednji Evropi. V njej je zaposlenih okoli 10.000 delavcev. Ima obrate in prodajna mesta po vsem svetu, predvsem pa v Aziji. Podjetje A je globalni tehnični vodja v panogi. V letu 2011 se je podjetje A odločilo za največji projekt, naložbo v zgodovini podjetja. Ta je obsegala gradnjo dveh novih obratov v Aziji za proizvodnjo vodilnih proizvodov v panogi. V obdobju med leti 2011 in 2017 bo tako celotna naložba v nova obrata obsegala približno 500 milijonov evrov. Zaradi tako velikih naložb in stalnih sprememb, mora podjetje poskrbeti, da bodo njegovi zaposleni lahko zagotavljali stalne izboljšave na vseh področjih poslovanja – proizvodnja, raziskave in razvoj, kakovost, inženiring, prodaja in druge upravne funkcije, ki bodo poskrbele za rast in soustvarjanje sprememb. Ena izmed pobud, ki podpira nenehno izboljševanje in obvladovanje sprememb je pobuda Lean Six Sigma – metoda za sistematično izboljševanje vseh procesov v podjetju.

ta način prejete povratne informacije nam služijo kot pomembna osnova za nadaljnje odločitve o tem, na katera področja procesa se moramo najbolj osredotočiti, ko izboljšujemo proces. V zvezi s potrebami naših internih strank, določimo merljive cilje o tem, kako izpolniti te potrebe. Opredelimo ključne kazalnike uspešnosti, izmed katerih so nekateri bolj povezani s kakovostjo (npr. zadovoljstvo internih strank, stopnja zadržanja zaposlenih v prvem letu zaposlitve, itd.), drugi pa s hitrostjo (npr. čas do zaposlitve). Ti ključni kazalniki uspešnosti se izmerijo tudi po koncu projekta za izboljšanje z namenom zagotovitve trajnosti izboljšanega procesa.

V fazi *»izmeri«* dokumentiramo in izmerimo prvotno stanje procesa. V tej fazi uporabimo metodo Makigami, da predstavimo procesni tok in s tem razdelimo procesne dejavnosti na tiste, ki prinašajo dodano vrednost in tiste, ki je ne prinašajo ter ocenimo potrebni vnos časa za vsak posamezni korak procesa. Poleg tega, za vsak korak procesa opredelimo tudi kdo (posameznik ali funkcija) je odgovoren za njegovo realizacijo. Pripravimo tudi seznam težav, ki se pojavljajo v določenih korakih procesa in pretehtamo, kakšne bi bile možne rešitve za te probleme. V tej fazi naredimo tudi zelo podrobne meritve vseh aktivnosti znotraj treh najbolj zamudnih korakov procesa. V ta namen uporabimo Analizo strukture dejavnosti. Pred izboljšanjem procesa izračunamo še trenutne stroške procesa.

V fazi *»analiziraj«* poskušamo zaznati oz. odkriti nepotrebne aktivnosti in nato predlagati načine za njihovo odpravo. Za večje težave, ki nastajajo med samim potekom procesa, skušamo najti vzroke s pomočjo uporabe diagrama Ishikawa in miselnega vzorca. Do tega koraka izvajanja, so odkrite številne možnosti za izboljšanje, medtem ko so v fazi »analiziraj« te možnosti postavljene v vrstni red glede na prioriteto.

V fazi *»izboljšaj«* izboljšamo proces z namenom odprave raznolikosti med iteracijami dobave storitev, najdemo alternative in uvedemo načrt za izboljšanje procesa. Predstavimo tudi naš prihodnji načrt o tem, kako si zamišljamo prenovljeni procesni tok. Poleg že omenjenega, predstavimo tudi pristop o tem, kako bomo uporabili metodologijo 5S v okviru oddelka kot celote.

Faza *»nadziraj«* služi za izboljšanje sistemov in struktur, uvedbo trajnostnih rešitev za proces in zagotovljanje trajne stabilnosti. Opredelimo tudi ključne kazalnike uspešnosti, ki bodo merili prihodnje izvedbe procesa.

(McClusky in Anbari v Kwak 2004; A.M.T. successfactory in Uckert Sigma Consulting 2015c)

Kratek povzetek DMAIC modela za upravljanje izboljšav se nahaja v tabeli 6.1 spodaj:

Tabela 6.1: Model DMAIC - Povzetek

D	**Define** (**Opredeli**) cilje izboljšave.
M	**Measure** (**Izmeri**) obstoječi sistem.
A	**Analyse** (**Analiziraj**) sistem z namenom opredelitve načinov za odpravo vrzeli med trenutnim delovanjem procesa in želenim ciljem.
I	**Improve** (**Izboljšaj**) sistem.
C	**Control** (**Nadziraj**) novi sistem.

Vir: Pyzdek (2003, 4)

IZKUŠNJE, PRIDOBLJENE PRI IZVAJANJU PROJEKTA ZA IZBOLJŠANJE IN OMEJITVE PRISTOPA LEAN SIX SIGMA

Med izvajanjem našega projekta za izboljšanje, smo pridobili nekaj dragocenih izkušenj. Prva je, da so projekti za optimizacijo v nekaterih primerih lahko povezani s strahom zaposlenih, ki si lahko začnejo zastavljati vprašanja, kot so: "Zakaj nas merijo?", "Kaj delamo narobe?", "Kaj pomeni rezanje stroškov zame osebno?", "Kakšen je "glavni načrt", ki se skriva za vsemi temi aktivnostmi?" in podobno. To se še zlasti dogaja v organizacijskih okoljih, kjer *organizacijska kultura* ni pripravljena na izvajanje tovrstnih projektov. Upravljanje *operativnih in kulturnih sprememb* se zato v takšnih okoljih lahko izkaže za izredno zahtevno. V tovrstnih okoliščinah se intenzivna *komunikacija* od zgoraj navzdol in znotraj same projektne ekipe zato izkaže za še bolj ključno.

Izkusili smo tudi, da je glavni pogoj za uspešnost projektov Lean Six Sigma močna *podpora in zavezanost najvišjega vodstva in vodij oddelkov,* katere zadevajo ti projekti. Če vodje niso dovolj odprti za prilagajanje svojega načina vodenja novim poslovnim strategijam, kot je na primer strategija Lean Six Sigma, ti ne morejo aktivno podpirati in

krepiti ekip, ki izvajajo projekte za izboljšanje. V tem primeru projekti za izboljšanje ne morejo biti uspešni – možno je celo, da propadejo.

Že na samem začetku projekta je treba poskrbeti, da je na voljo *dovolj virov*, kar se nanaša predvsem na razpoložljivost projektnega vodje in članov projektnega tima.

Zadnji nauk, ki ga je potrebno omeniti, je *vrzel med avtopercepcijo* o naših storitvah in *percepcijo drugih* o teh storitvah. Zato je izjemno pomembno, da stranke, bodisi zunanje ali notranje, povprašamo o njihovem mnenju glede trenutnega procesa in jih vključimo v sodelovanje na projektih za izboljšanje.

Kot je bilo že predhodno omenjeno v tem poglavju, številne omejitve Lean in Six Sigme ne veljajo več, če jih uporabimo kot pristop Lean Six Sigma. Z našega vidika lahko potrdimo, da smo pri pristopu Lean Six Sigma naleteli le na nekaj posameznih nepopolnosti. Prva izmed njih je, da so projekti dolgotrajni, še zlasti, če pred samim začetkom projekta ni na voljo podatkov o procesu. Druga omejitev se kaže kot dejstvo, da lahko merimo uspešnost projekta za izboljšanje šele nekaj časa po tem, ko je projekt za izboljšavo že izveden. Na podlagi naših izkušenj lahko še dodamo, da se je ob pričetku merjenja procesa pojavilo tudi nekaj "etičnih" vprašanj – nekateri izmed zaposlenih so nam namreč očitali, da Lean Six Sigma namerava robotizirati interakcije med ljudmi in da ni primeren za uporabo na področju storitev, še posebej pa ne na področju upravljanja človeških virov. Kakorkoli že, menimo, da so tovrstna vprašanja rezultat pomanjkanja zaupanja v podjetju in prešibke komunikacije o tekočih Lean Six Sigma projektih za izboljšanje.

PRIPOROČILA ZA PODJETJE A

Naše prvo priporočilo za podjetje A je, naj se prilagodi demografskim spremembam na trgu delovne sile. Število milenijcev[21] na trgu dela namreč hitro narašča. V primerjavi s prejšnjimi generacijami, ima ta generacija drugačne zahteve in želje v zvezi z delovnimi okolji. Cenijo prožnost delovnega sloga in delovnega časa ter mobilnost, medtem ko je zanje poistovetenje s proizvodom izjemno pomembno. Po drugi strani ne cenijo zapletenih hierarhij in kompleksnih procesov odločanja, temveč raje hitro dosegajo rezultate. Na

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[21] Generacija rojena med 1980 in 2000.

splošno gledano velja, da milenijci želijo doseči spremembe (Gursoy in drugi 2013). Poleg že navedenega, milenijci cenijo tudi nenehne povratne informacije, zato bi moralo podjetje A tudi ponovno vzeti v obzir pogostost ocenjevanja delovne uspešnosti zaposlenih (trenutno se ta izvajajo le enkrat letno).

Število milenijcev na trgu delovne sile bo v prihodnjih letih še raslo. Zaradi drugačnih želja milenijcev o njihovem delovnem okolju, podjetju A predlagamo, da se bolj osredotoči na potrebe te skupine zaposlenih v prilagajanju procesa "onboardinga". To še zlasti obsega privabljanje in vključevanje milenijcev v delovno okolje. V ta namen je zato treba vzpostaviti marketinške aktivnosti podjetja, ki predstavlja podjetje kot dobrega zaposlovalca za milenijce. Informacije o podjetju morajo biti posredovane preko e-učenja in videoposnetkov, tudi (mobilna) tehnologija pri vsem tem igra pomembno vlogo (Brack 2012). V prvih nekaj tednih zaposlitve mora biti jasno, kako novi zaposleni lahko raste in tudi razvije svoj potencial znotraj podjetja. Milenijci cenijo sproščeno in prožno organizacijsko kulturo, ki podpira odprto komunikacijo in transparentnost. Ključno je ustvariti "vau" učinek in poskrbeti, da bosta njihov prvi dan in teden v podjetju zabavna in nepozabna. Podjetje A bi se moralo izogibati posredovanju prevelikih količin formalne dokumentacije o procesih, pravilih, postopkih in politikah v branje zaposlenemu na njegov prvi delovni dan ali teden. Informacije, ki jih je treba posredovati novincu je treba prenesti na karseda jedrnat način s pomočjo uporabe rešitev IT (na primer e-učenja). Pri tem morajo, če je to potrebno, sodelovati tudi strokovnjaki z različnih področij v podjetju, saj jim le-ti lahko zagotovijo potrebna dodatna pojasnila. Nekatera podjetja se v ta namen poslužujejo kar uporabe pristopa, pri katerem novincu že pred prvim delovnim dnem pošljejo nekaj dokumentacije ali e-učenje, tako da novi zaposleni lahko že prične s pridobivanjem pomembnih notranjih informacij o podjetju (na primer seznam najpogosteje zastavljenih vprašanj s strani novih zaposlenih in odgovorov na ta vprašanja).

Drugo priporočilo za izboljšanje procesa "onboardinga" je dajanje poudarka na lastno identiteto novih zaposlenih, ne pa na to, kako se ljudje lahko prilagodijo organizacijskemu okolju. Cable (Cable in drugi 2013, 23) navaja, da »s spodbujanjem novih zaposlenih k uporabi svojih osebnih odlik za delo, podjetje svojim novim zaposlenim lahko pomaga, da ti postanejo bolj povezani s svojimi sodelavci, so bolj vključeni v svoje delo in da nenazadnje obstaja tudi večja verjetnost, da bodo ostali« v podjetju. Ta pristop spodbuja

socializacijo v skladu z osebno identiteto, ki vključuje spodbujanje novincev k izražanju njihove edinstvene perspektive in prednosti na delovnem mestu in k oblikovanju njihovega dela kot neke vrste platforme za izvajanje tistega, kar delajo najbolje (Cable in drugi 2013). Organizacija mora prepoznati sposobnosti in prednosti novinca in mu v skladu s tem dodeliti naloge v oddelku. Dobro orodje za uporabo je tudi Analiza strukture zahtev, ki jo je mogoče izvajati v rednih časovnih presledkih (na vsakih šest mesecev, vsako leto ali ko se ekipi pridruži novi zaposleni). Pri dodeljevanju nalog je dobro, če vodja združi svoje znanje in izkušnje s testi in orodji, ki merijo prednosti, vrednote, motivacijo, vedenje in sposobnosti članov ekipe (na primer INSIGHTS MDI ali SDI).

Ker je podjetje A proizvodno podjetje, je izjemno pomembno, da ima uveden proces "onboardinga" tudi za proizvodne delavce. V teh primerih ključno vlogo namreč igra neposredni vodja. Kakorkoli že, kadrovski oddelek mora zagotoviti smernice in voditi proces »onboardinga« za nove zaposlene. S strani kadrovskega oddelka morajo biti zagotovljena tudi orodja, jasno dodeljevanje odgovornosti in podpora, čeprav se večina aktivnosti izvaja v okviru oddelka, ki sprejme novega zaposlenega. Znotraj vsakega oddelka mora obstajati določena stopnja prožnosti za prilagajanje procesa »onboardinga«, saj vsak zaposleni zahteva drugačni stil vodenja. Po drugi strani pa posebno pozornost in edinstveni pristop zahteva tudi »onboarding« za vrhnje vodstvo. Eden izmed razlogov za to je dejstvo, da so kadrovske spremembe na najvišjih ravneh organizacije zelo drage. Drugi razlog za to pa predstavlja kvalitativna nota – vrhnji vodje so namreč najpomembnejši ustvarjalci organizacijske kulture, ki se prenaša od zgoraj navzdol, zatorej pogoste spremembe ne vplivajo pozitivno na organizacijsko stabilnost.

Podjetje A bi moralo vedno slediti novim trendom in prilagajati strategije "onboardinga" spremenjenim okoliščinam. Izboljšani proces ne bi smel ostati nespremenjen vrsto let, temveč bi ga bilo treba nenehno spreminjati in prilagajati, da bi se zagotovile stalne izboljšave in konkurenčna prednost pred tekmeci. Kvaliteten, dobro načrtovan in impresiven proces "onboardinga" namreč močno prispevajo k dobri blagovni znamki podjetja kot delodajalca.

Želeli bi poudariti še dve priporočili, ki se nanašata predvsem na pobudo Lean Six Sigma v podjetju A. Med analizo smo ugotovili, da kadrovski oddelek ni vključen v izvedbo pobude

Lean Six Sigma in da celoten program Lean Six Sigma pravzaprav vodi oddelek za kakovost. Zaradi tega podjetje A ne more uživati ugodnosti nekaterih vidikov, ki jih lahko prinese le vključenost kadrovskega oddelka (glej poglavje 1.4). Kljub vsemu pa je pozitivno, da kadrovski oddelek aktivno sodeluje v pobudi z projektom izboljšave lastnega poslovnega procesa na kadrovskem področju (izboljšanje procesa »onboardinga«, ki je predstavljen v tej diplomski nalogi), a kljub temu predlagamo več sodelovanja z oddelkom za kakovost pri vodenju celotne pobude.

Podjetju A prav tako priporočamo, da pri uvajanju novih procesov uporabi elemente Lean Six Sigme že pri samem vzpostavljanju novih procesov in ne zgolj pri izboljševanju procesov.

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APPENDIXES

Appendix A: VOC Questionnaire

Voice of customer – Onboarding Process

SCALE - extend of (dis)agreements with the statements:	Significance for the customer	
1 Strongly disagree 2 Disagree 3 Slightly disagree 4 Slightly agree 5 Agree 6 Strongly agree	H High L Low	Please fill in only the red fields.

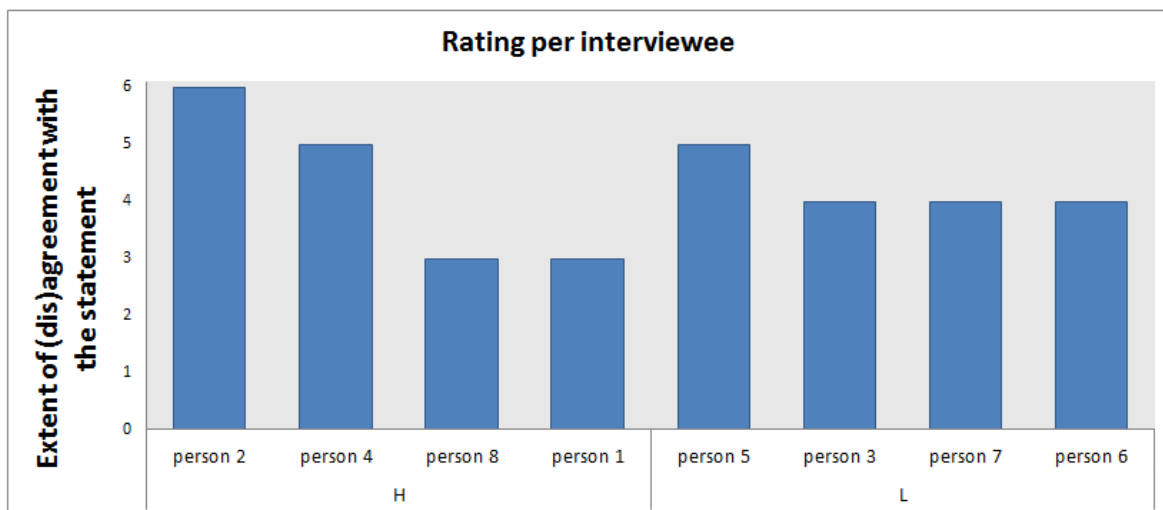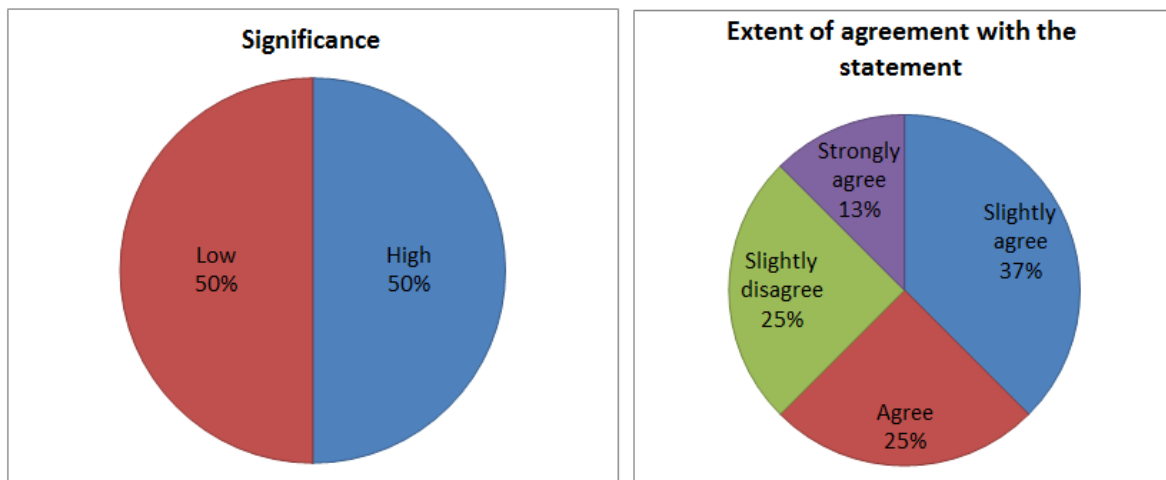|	VOC Questions cluster	Questions	Answers (1-6)	Significance for the customer (H/L)
		Recruitment requisition		
1	Quality of service/Efficiency	The process of requesting a new employee is easy and user-friendly. Recruiting requisition form is easy to fill in/self-explanatory		
2	Quality of service/Efficiency	From HR I received clear guidelines and support about what I need to fill in the recruiting requisition form (like job grade, job title, salary range, etc.)		
		Preselection of candidates		

3	Roles clarity/Process steps clarity	Preselection of candidates was already done by the recruiter. I already reviewed preselected CVs.		
4	Roles clarity/Process steps clarity	Based on preselected CVs I decided which candidates I want to invite for a personal interview.		
		(in case of a head-hunting agency)		
5	Organisational view/Transparency	Costs of external search were known to me in advance. Actual costs matched the forecast costs.		
6	Quality of service/Efficiency	Services of an external agency were of good quality.		
		Interview		
7	Organisational view/Transparency	Interview organisation was good. Times/dates and other information (call-in number/meeting rooms/résumés of candidates) were sent to me on time.		
8	Quality of service/Efficiency	The interview together with the recruiter was well structured and fluent.		
9	Roles clarity/Process steps clarity	I received useful tips from the recruiter before the interview on how the interview would be structured (what is my role, as manager, and what is the role of the recruiter).		
		Offer		
10	Quality of service/Efficiency	When I/we decided on the candidate, a draft of the offer was provided – smoothly and in the expected/reasonable timeframe.		
		General		
11	Roles clarity/Process steps clarity	In the recruiting process I was always clear about the status and next steps which follow.		
12	Quality of service/Efficiency	From the recruiter I got timely clarifications which I asked for.		

#	Category	Question		
13	Quality of service/Efficiency	The duration of the recruiting process was acceptable to me (from recruiting requisition until the contract was signed).		
14	Roles clarity/Process steps clarity	After the candidate signed the contract, I received clear instructions about the next steps needed from my side (how to request IT accesses, what to prepare for the new employee).		
15	Roles clarity/Process steps clarity	HR arranged all the administrative requirements with the new employee within the first few days of the start date (e.g. signing the code of conduct, appointment with a doctor, health and safety training…)		
16	Quality of service/Efficiency	HR supported the onboarding process and employee adjustment (organisational socialisation) – I received enough proactive support from HR in the first year of my employee's employment.		
17	Quality of service/Efficiency	My employee received basic, hard skills and soft skills training within their first year of employment.		
18	Quality of service/Efficiency	HR proactively supported my new employee to get to know the organisational environment and company culture.		
19	Roles clarity/Process steps clarity	I was clear about the roles and responsibilities in the recruiting and onboarding process (it was also clear to me who is responsible for which topic within the HR Department).		
20	Roles clarity/Process steps clarity	It was always clear to me when action from my side was required in the onboarding process.		
		OPEN QUESTIONS *(optional)*		
1		What is the most important for you, as a customer, in the onboarding process?		
2		What do you like/dislike?		

Appendix B: Voice of Customers (VOC) – Results per each question

Question 1

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
1	Recruitment requisition	Quality of service/Efficiency	The process of requesting a new employee is easy and user friendly. Recruiting requisition form is easy to fill in/self-explanatory	4.3	50%	50%

Significance

Low 50%   High 50%

Extent of agreement with the statement

Strongly agree 13%
Slightly agree 37%
Agree 25%
Slightly disagree 25%

Rating per interviewee

Extent of (dis)agreement with the statement

person 2, person 4, person 8, person 1 (H)
person 5, person 3, person 7, person 6 (L)

Question 2

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
2	Recruitment requisition	Quality of service/Efficiency	From HR I received clear guidelines and support about what I need to fill in the recruiting requisition form (like job family, job title, salary range…)	4.1	63%	38%

Significance

Low
38%

High
62%

Extent of agreement with the statement

Disagree
13%

Slightly
disagree
25%

Agree
12%

Slightly
agree
25%

Strongly
agree
25%

Rating per interviewee

Extent of (dis)agreement with the statement

person 4 — person 8 — person 2 — person 1 — person 5 (H)

person 6 — person 3 — person 7 (L)
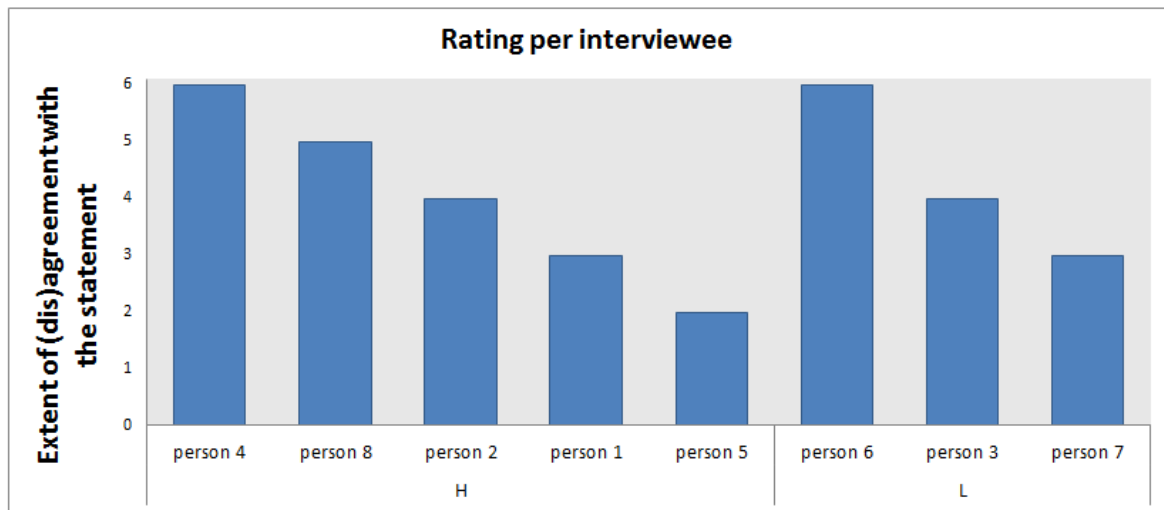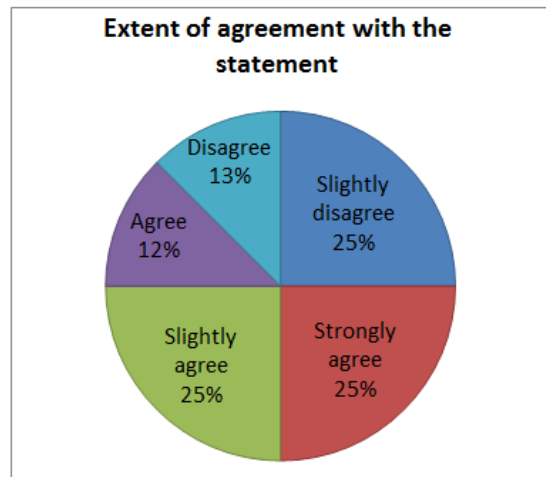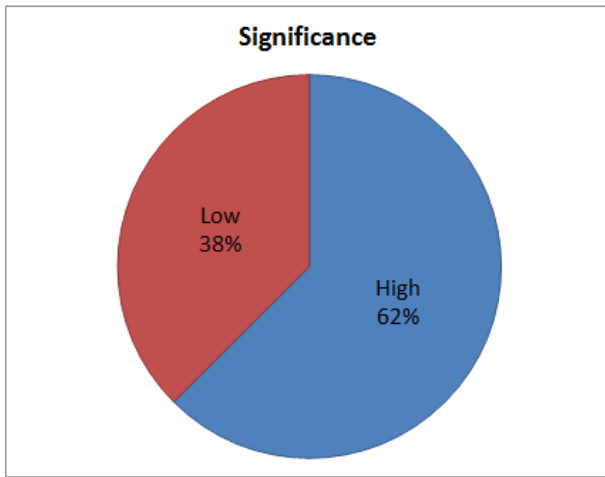
Question 3

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
3	Preselection of candidates	Roles clarity/Process steps clarity	Preselection of candidates was already done by the recruiter. I already reviewed preselected CVs.	3	88%	13%
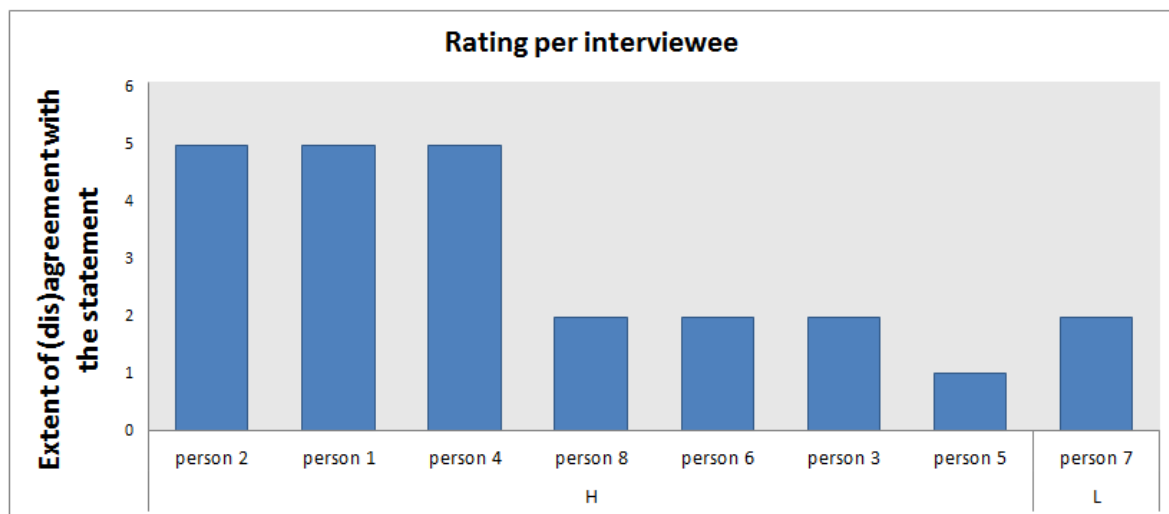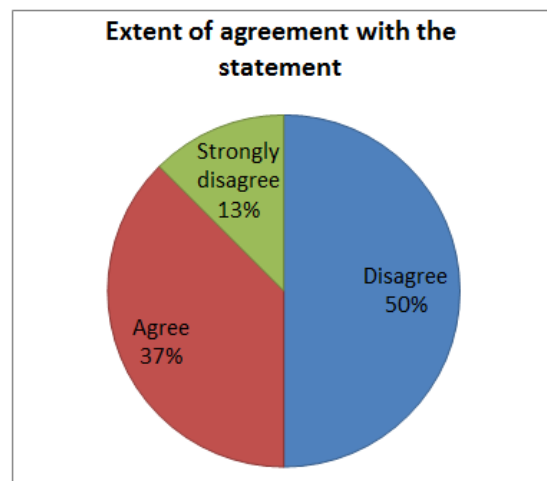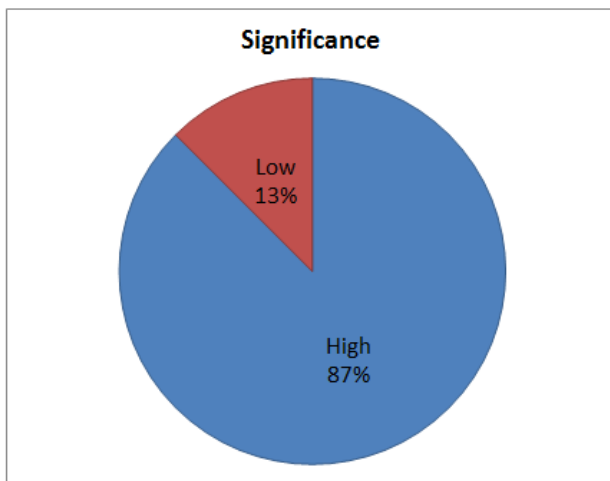
Question 4

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
4	Preselection of candidates	Roles clarity/Process steps clarity	Based on preselected CVs I decided which candidates I want to invite for a personal interview.	4.3	88%	13%

Significance

Low 13%

High 87%

Extent of agreement with the statement

Slightly agree 13%

Disagree 13%

Strongly disagree 12%

Agree 37%

Strongly agree 25%

Rating per interviewee

Extent of (dis)agreement with the statement

person 6 | person 2 | person 8 | person 1 | person 4 | person 3 | person 5 | person 7
H | | | | | | | L
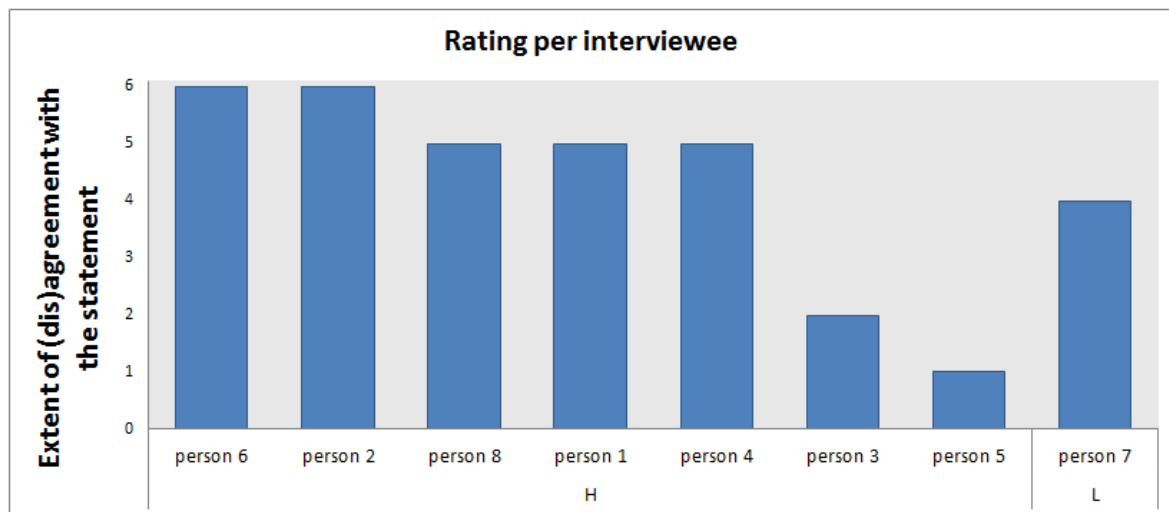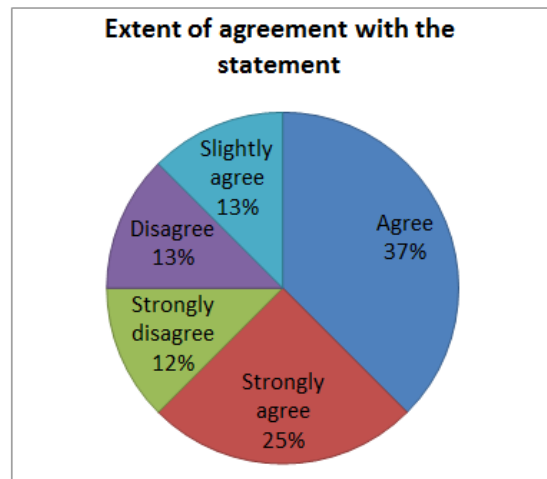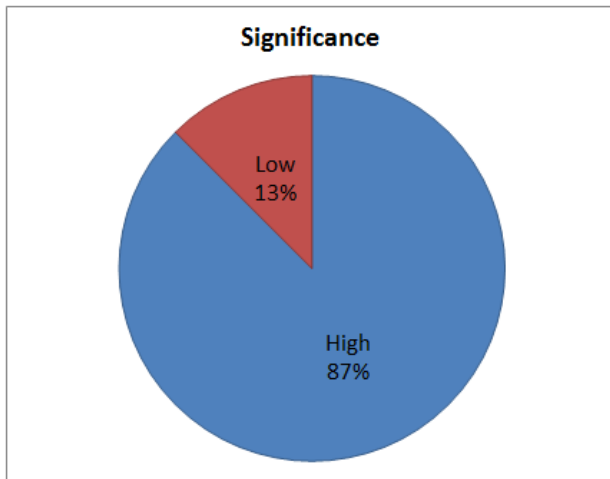
Question 5

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
5	(in case of head-hunting agency)	Organisational view/Transparency	Costs of external search were known to me in advance. Actual costs matched forecasted costs.	4.5	50%	50%

Significance

Low 50%   High 50%

Extent of agreement with the statement

Strongly disagree 17%

Slightly agree 33%

Strongly agree 50%

Rating per interviewee

Extent of (dis)agreement with the statement

person 2   person 3   person 1   person 6   person 7   person 8

H   L
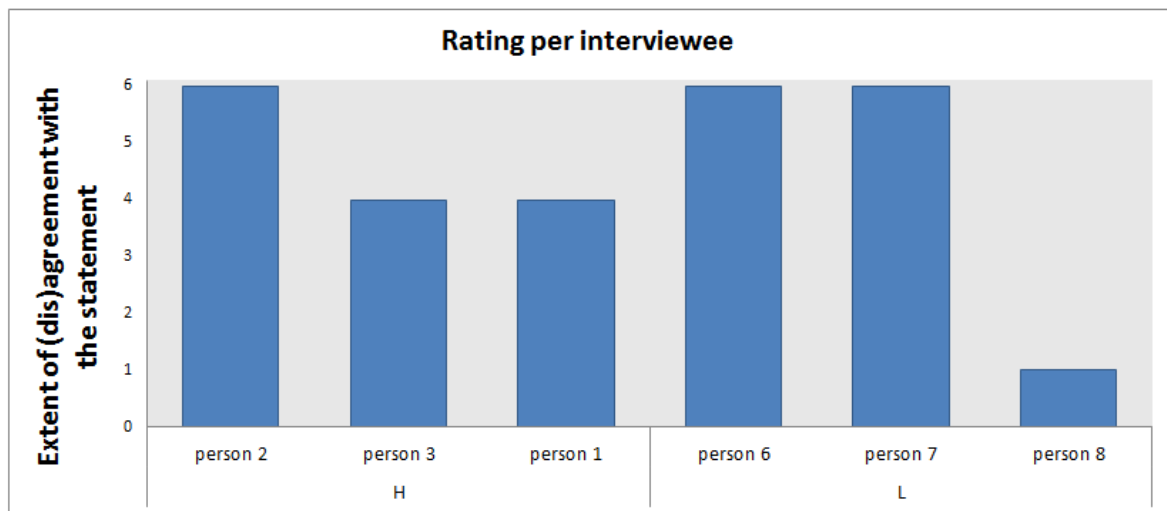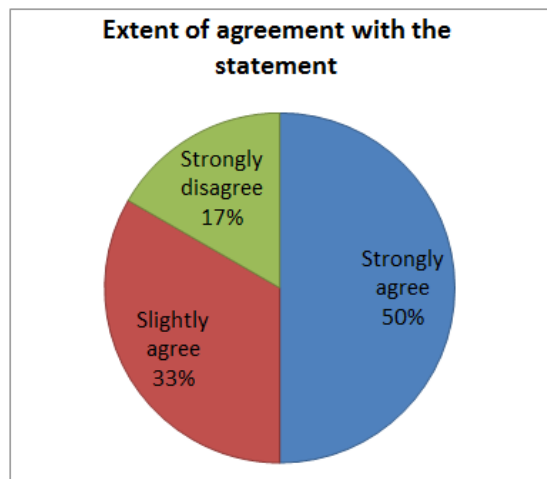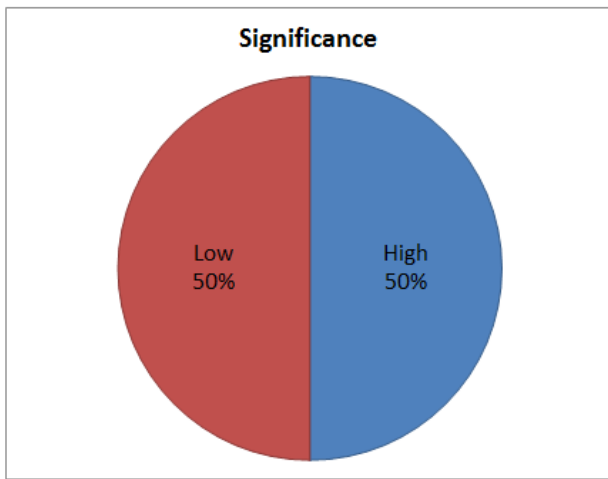
Question 6

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
6	(in case of head-hunting agency)	Quality of service/Efficiency	Services of external agency were of good quality.	3.7	83%	17%

Significance

Low 17%
High 83%

Extent of agreement with the statement

Slightly disagree 17%
Disagree 33%
Agree 50%

Rating per interviewee
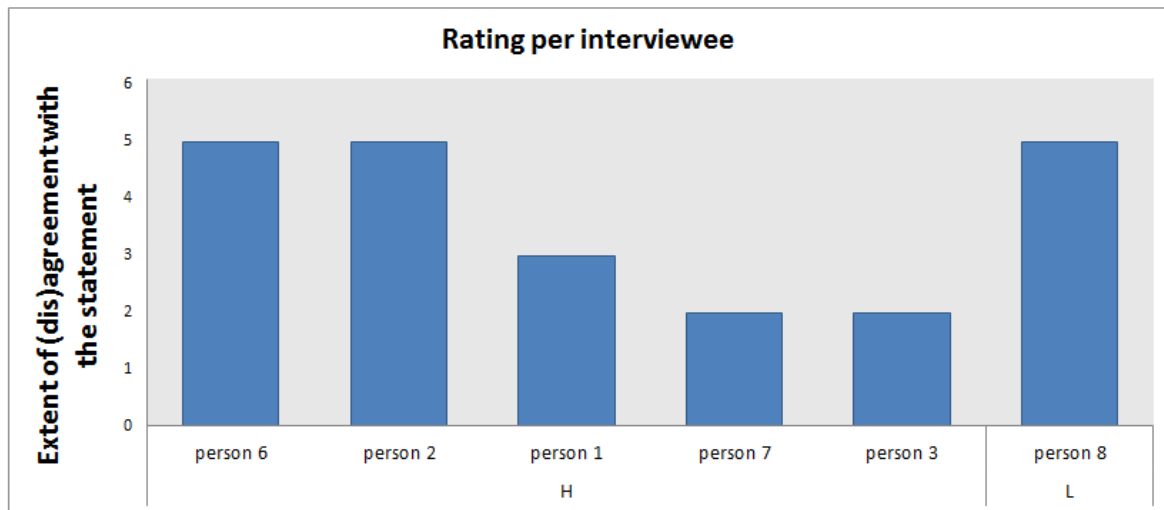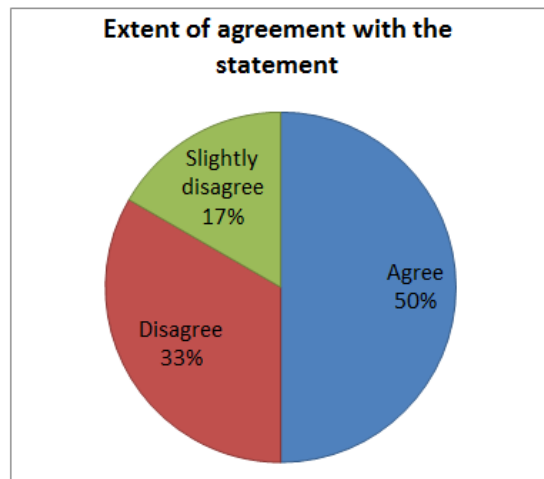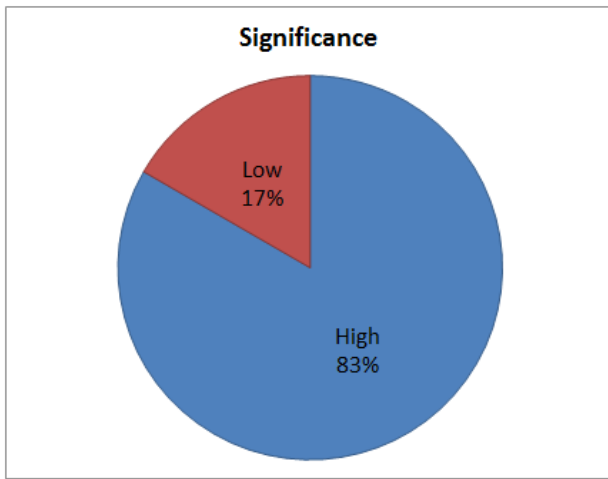
Question 7

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
7	Interview	Organisational view/Transparency	Interview organisation was good. Times/dates and other information (call in number/meeting rooms/CVs of candidates) were sent to me on time.	4.5	88%	13%

Significance

Extent of agreement with the statement

Rating per interviewee
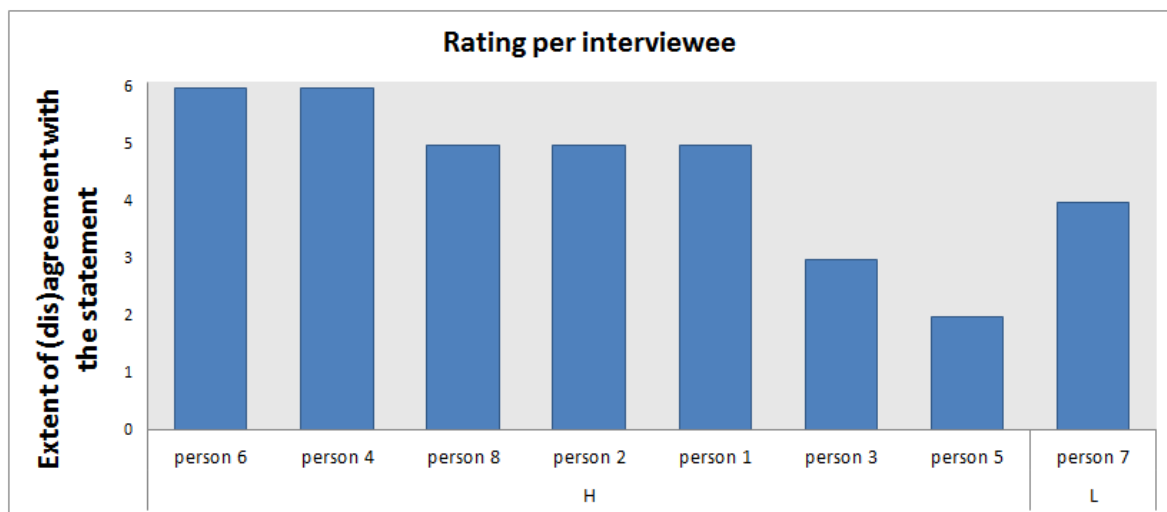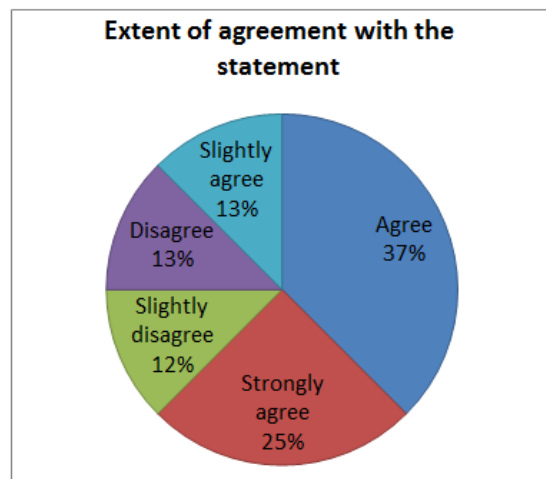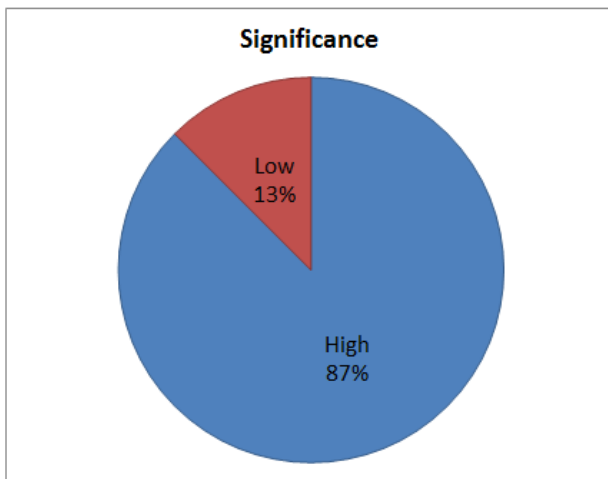
Question 8

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
8	Interview	Quality of service/Efficiency	The interview together with the recruiter was well structured and fluent.	4.9	100%	0%

Significance

High
100%

Extent of agreement with the statement

Slightly disagree 25%

Agree 37%

Strongly agree 38%

Rating per interviewee

Extent of (dis)agreement with the statement

| person 2 | person 6 | person 4 | person 1 | person 7 | person 5 | person 8 | person 3 |

H
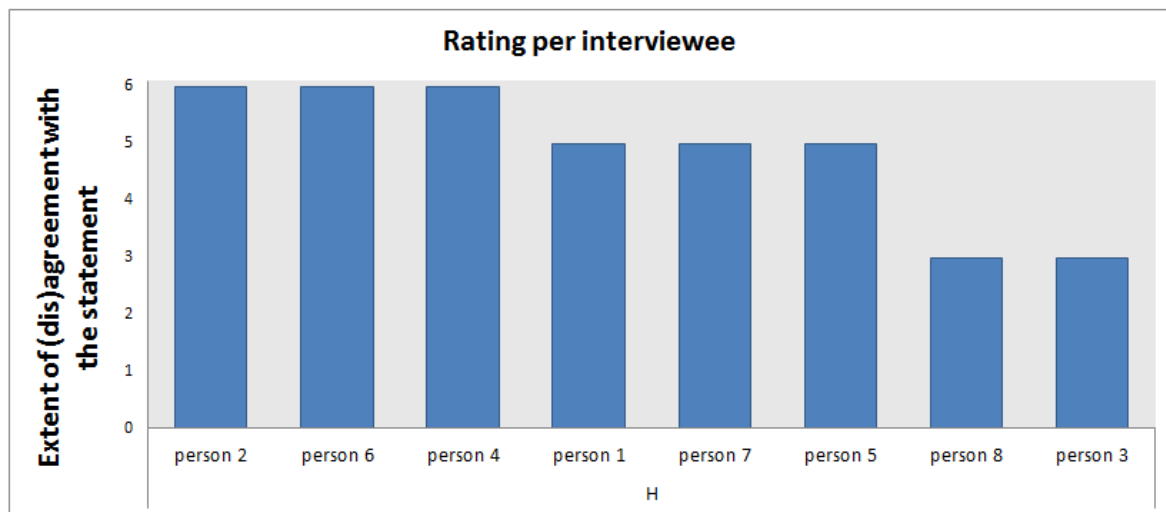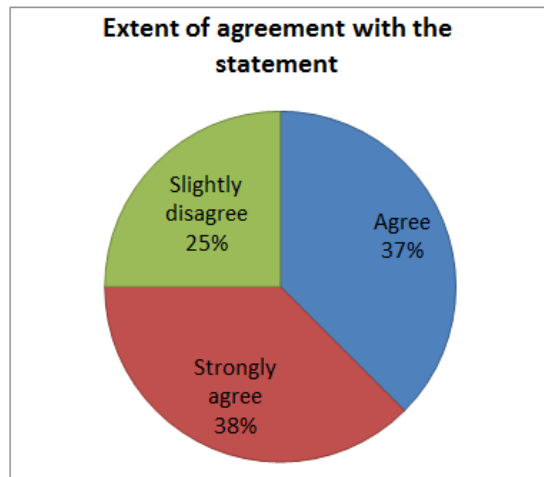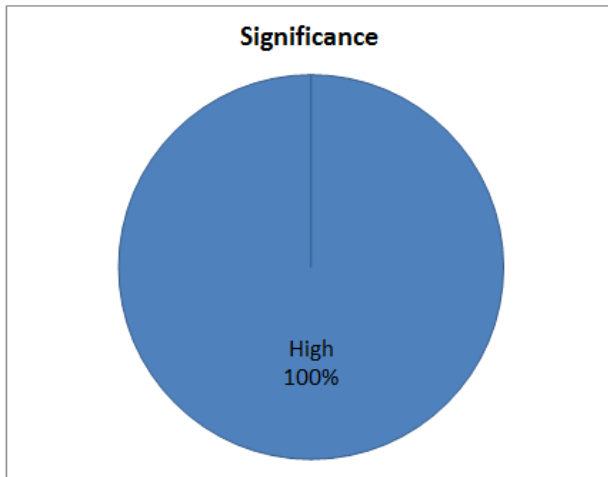
Question 9

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
9	Interview	Roles clarity/Process steps clarity	I obtained useful tips from the recruiter before the interview on how the interview would be structured (what is my role, as manager, and what is the role of the recruiter)	3.9	75%	25%

Significance

Low 25%
High 75%

Extent of agreement with the statement

Slightly agree 13%
Agree 12%
Strongly agree 25%
Disagree 25%
Slightly disagree 25%

Rating per interviewee
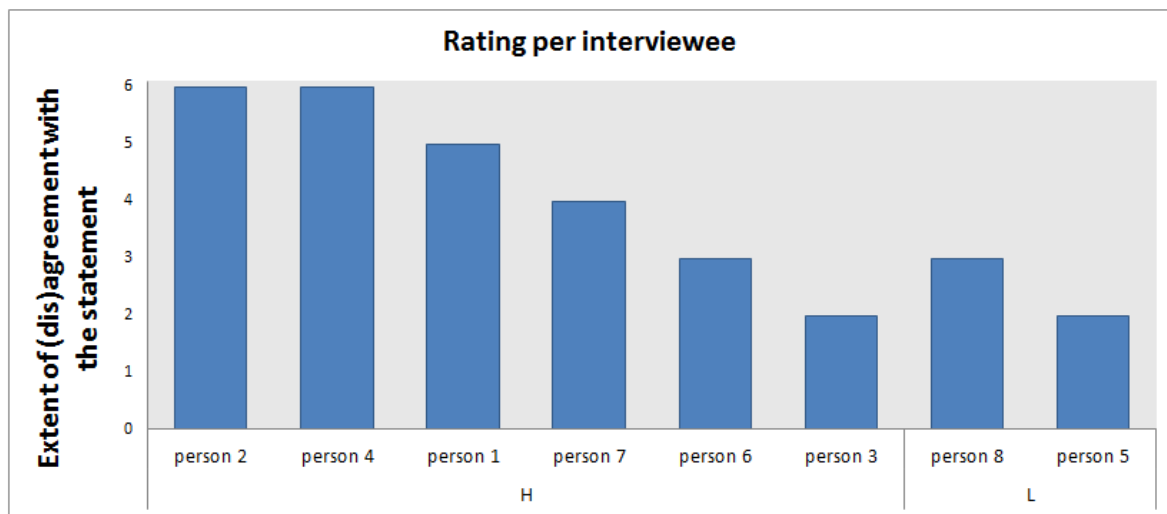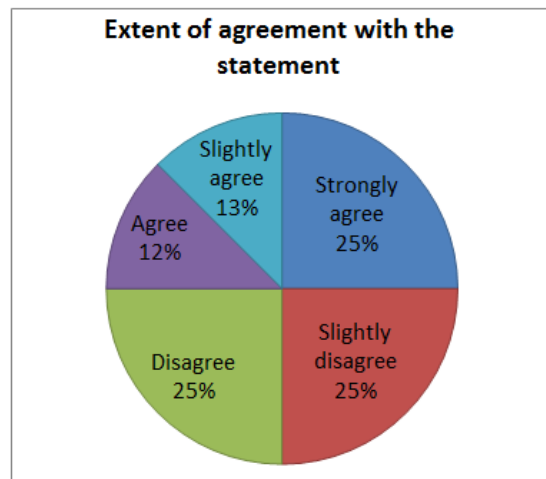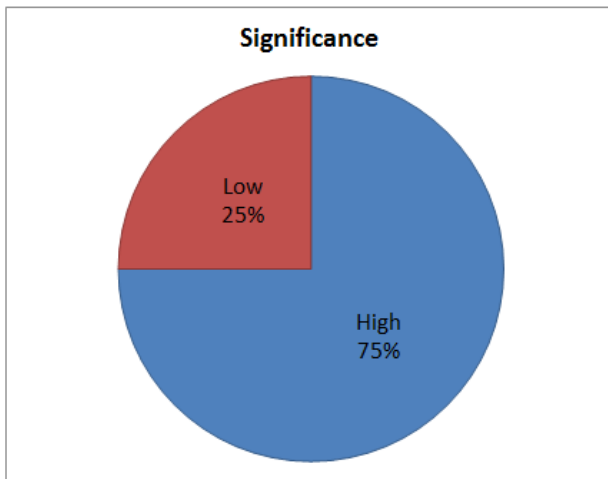
Question 10

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
10	Offer	Quality of service/Efficiency	When I/we decided on the candidate, a draft of the offer was provided - smoothly and in the expected/reasonable timeframe	5.1	75%	25%

Significance

Low 25%

High 75%

Extent of agreement with the statement

Slightly disagree 13%

Strongly agree 37%

Agree 50%

Rating per interviewee

Extent of (dis)agreement with the statement

person 7, person 6, person 2, person 5, person 4, person 1 — H

person 8, person 3 — L
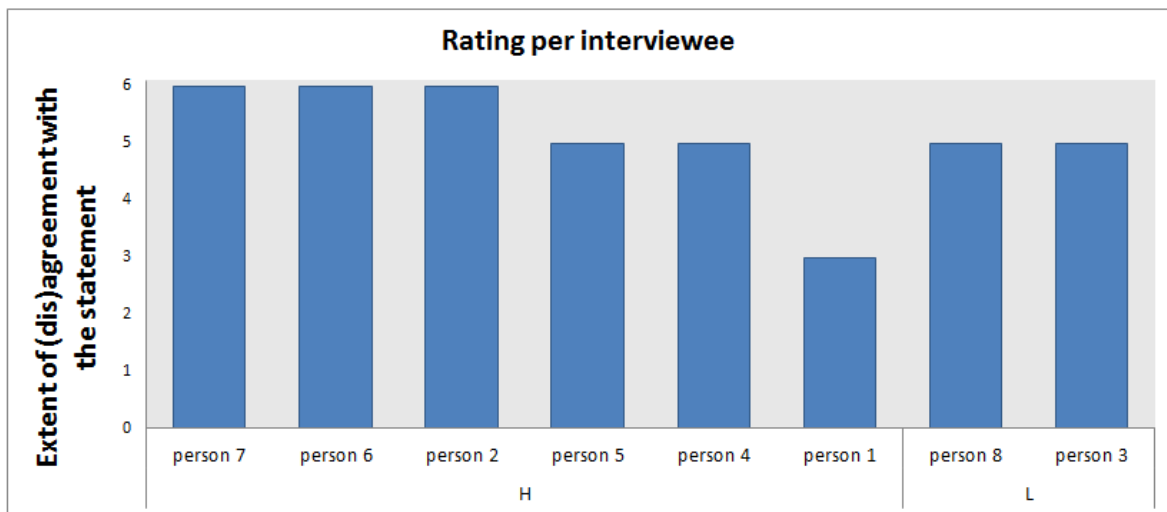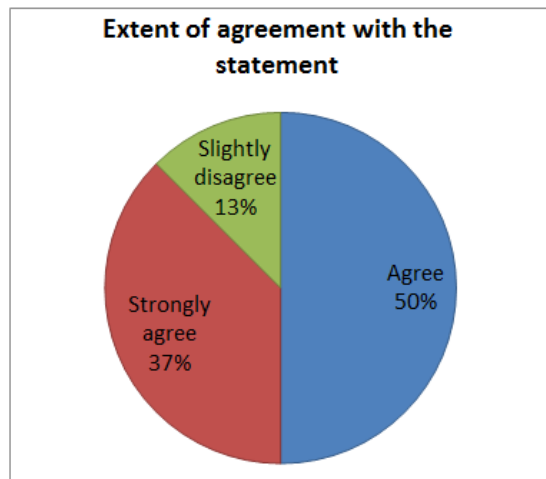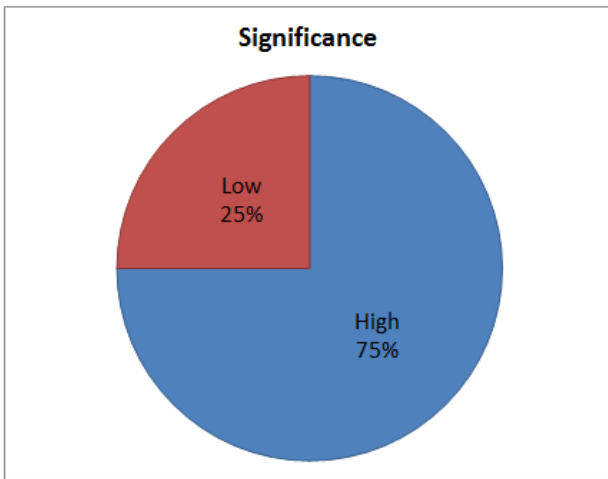
Question 11

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
11	General	Roles clarity/Process steps clarity	In the recruiting process I was always clear about the status and next steps which follow	4.4	88%	13%

Significance

Low 13%

High 87%

Extent of agreement with the statement

Slightly disagree 13%

Disagree 12%

Agree 25%

Slightly agree 25%

Strongly agree 25%

Rating per interviewee
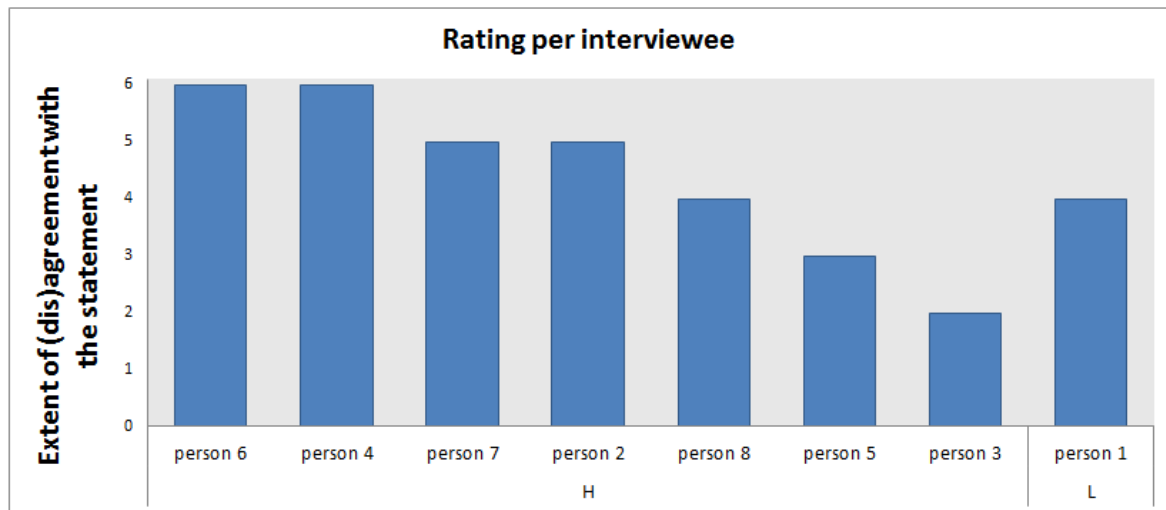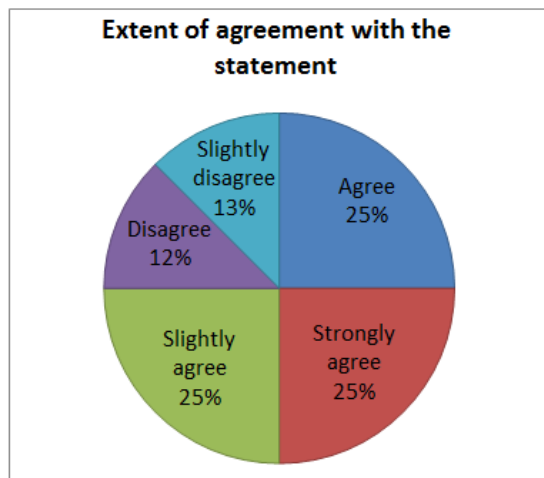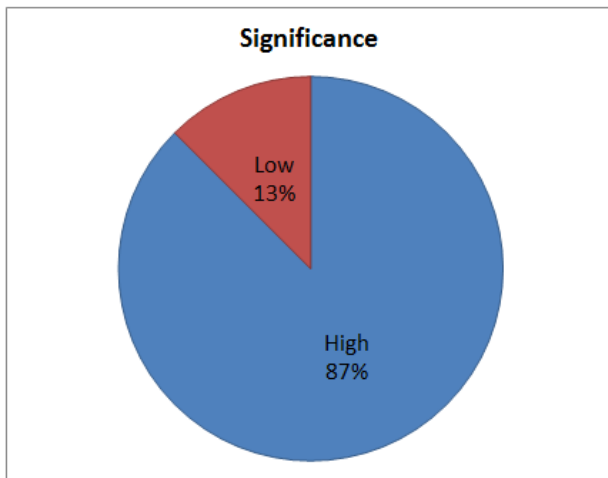
Question 12

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
12	General	Quality of service/Efficiency	From the recruiter I obtained timely clarifications which I asked for	4.7	86%	14%

Significance

Low 14%

High 86%

Extent of agreement with the statement

Slightly agree 14%

Strongly agree 14%

Slightly disagree 15%

Agree 57%

Rating per interviewee
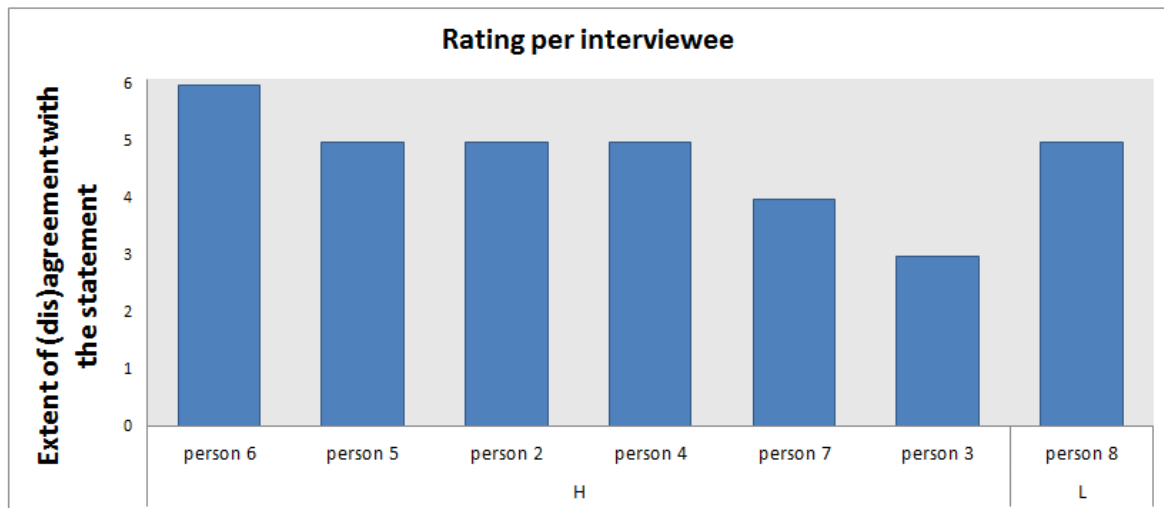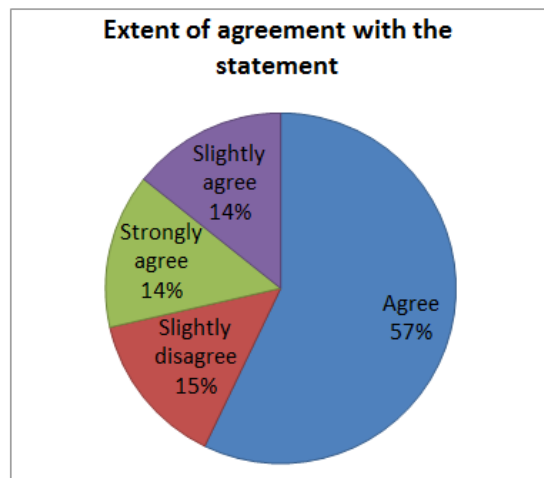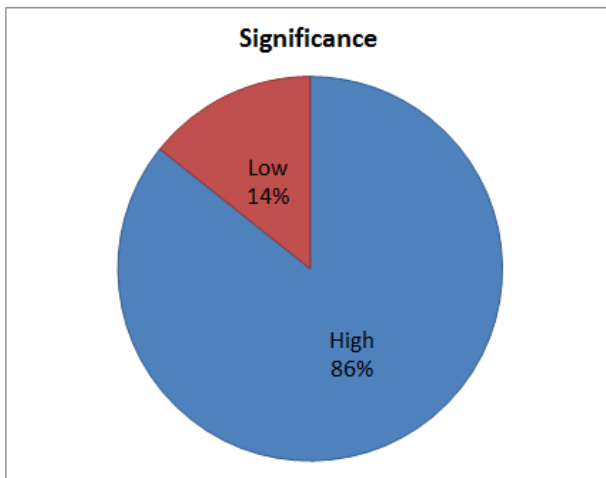
Question 13

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
13	General	Quality of service/Efficiency	The duration of the recruiting process was acceptable to me (from recruiting requisition until the contract was signed)	3.5	100%	0%

Significance

Extent of agreement with the statement

High 100%

Slightly disagree 13%
Strongly agree 13%
Disagree 37%
Agree 12%
Slightly agree 25%

Rating per interviewee
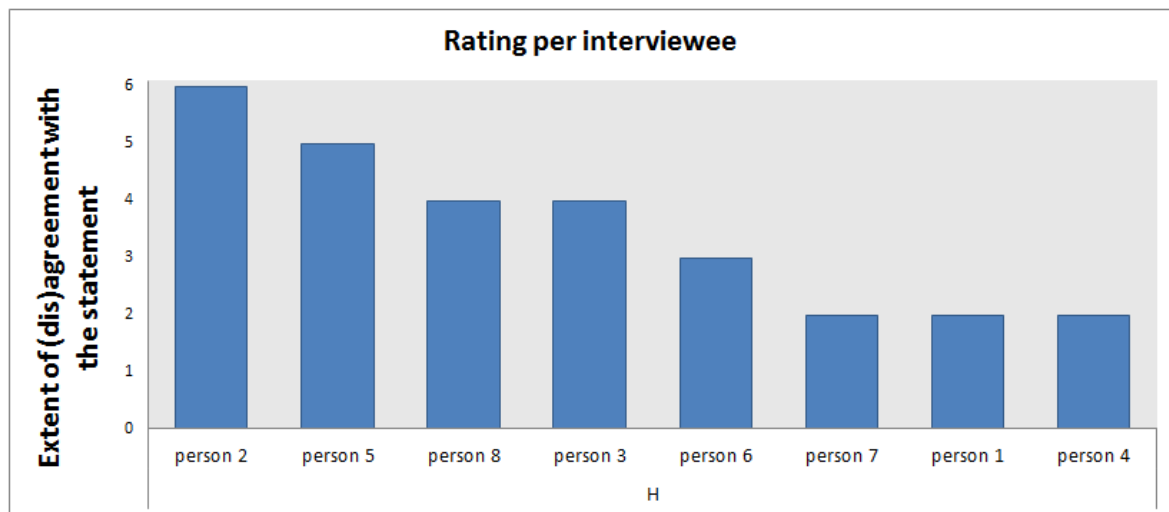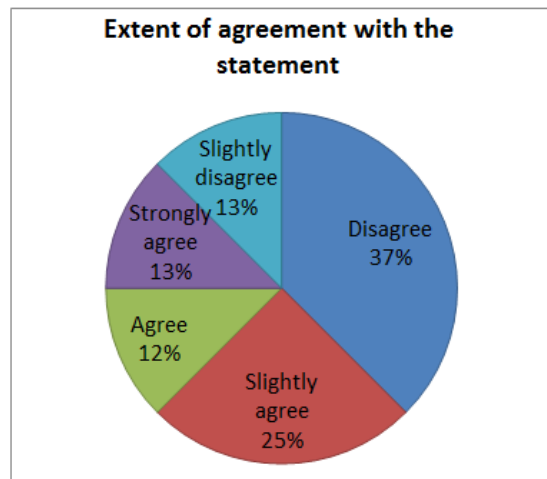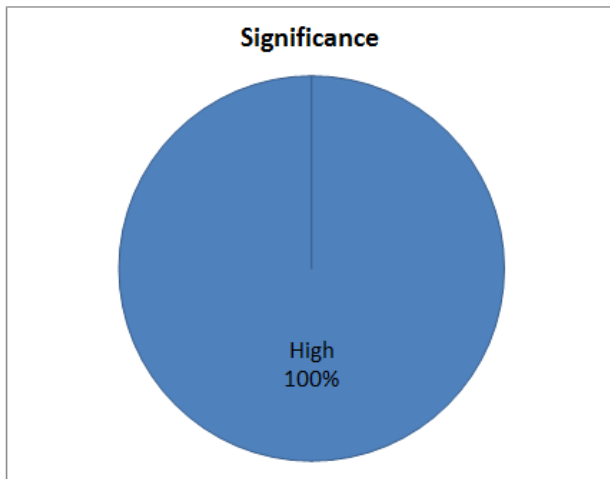
Question 14

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
14	General	Roles clarity/Process steps clarity	After the candidate signed the contract, I received clear instructions about next steps needed from my side (how to request IT accesses, what to prepare for the new employee).	4.8	38%	63%

Significance

High 37%

Low 63%

Extent of agreement with the statement

Slightly agree 13%

Strongly agree 13%

Slightly disagree 12%

Agree 62%

Rating per interviewee

Extent of (dis)agreement with the statement

person 6, person 8, person 2 — H

person 1, person 5, person 3, person 7, person 4 — L
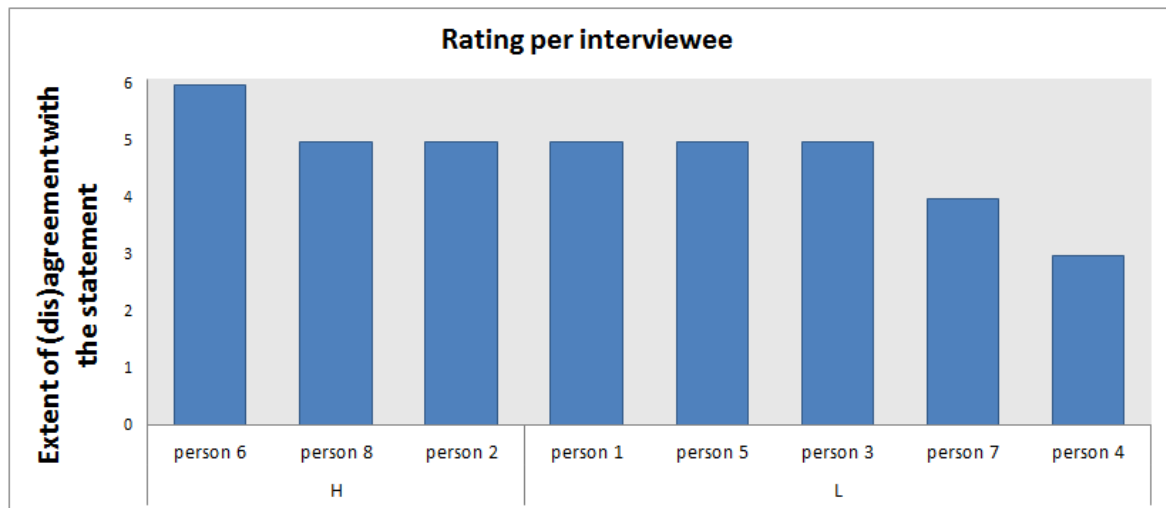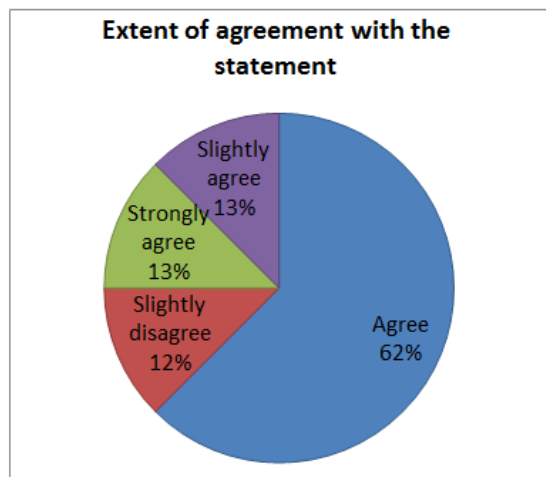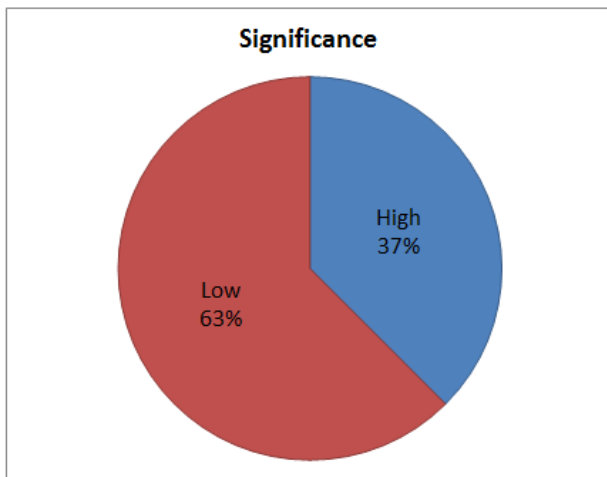
Question 15

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
15	General	Roles clarity/Process steps clarity	HR arranged all the administrative requirements with the new employee within the fist few days after start date (e.g. signing the code of conduct, doctors visit, health and safety training...)	5.1	63%	38%

Significance

High 62%

Low 38%

Extent of agreement with the statement

Strongly agree 13%

Agree 87%

Rating per interviewee

Extent of (dis)agreement with the statement

| person 6 | person 1 | person 8 | person 4 | person 5 | person 2 | person 7 | person 3 |

H   L
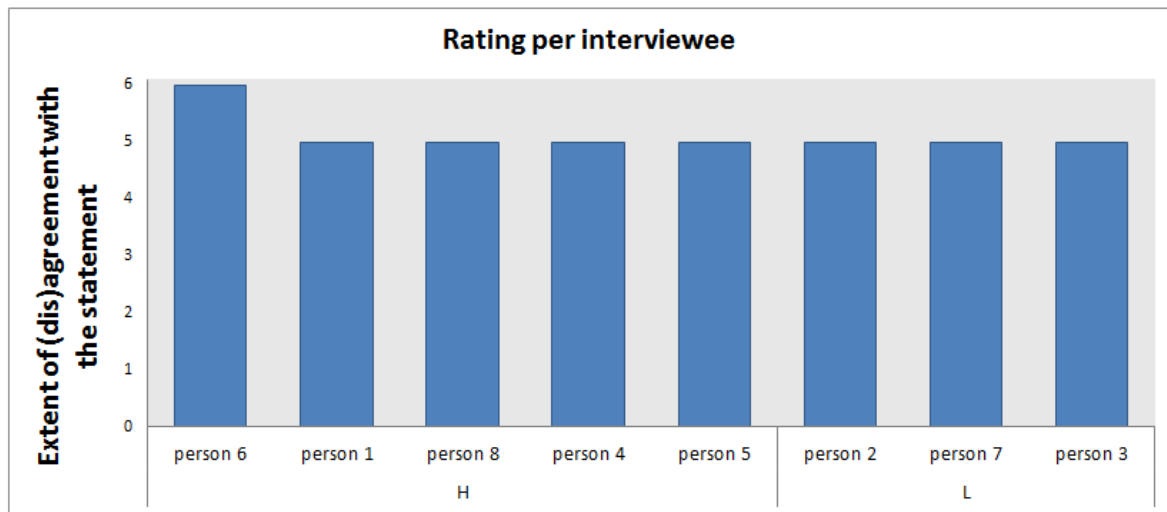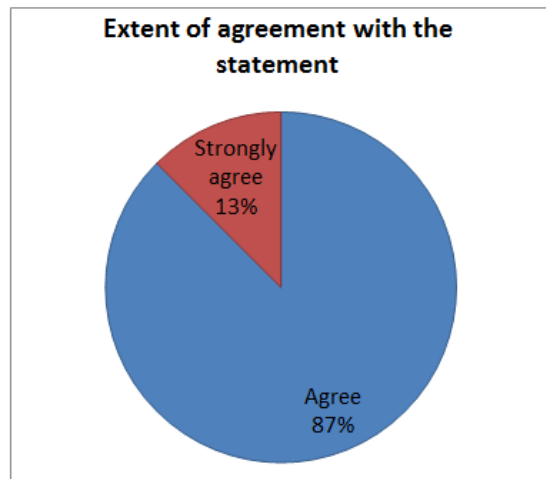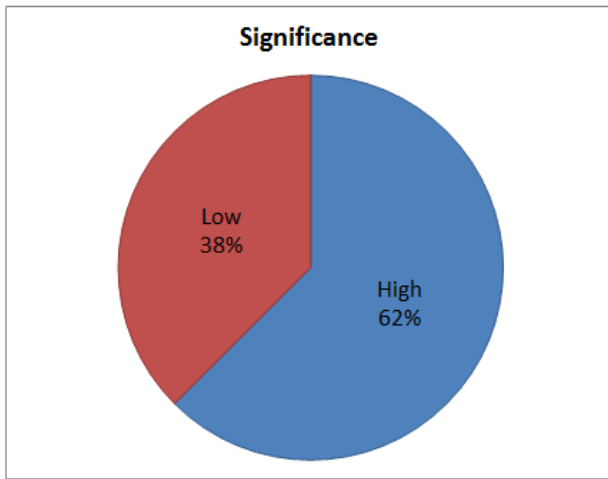
Question 16

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
16	General	Quality of service/Efficiency	HR supported onboarding process and employee adjustment (organisational socialisation) - I recieved enough proactive support from HR in the first year of employment of my employee.	3.3	43%	57%

Significance

High 43%

Low 57%

Extent of agreement with the statement

Agree 14%

Slightly agree 28%

Disagree 29%

Slightly disagree 29%

Rating per interviewee

Extent of (dis)agreement with the statement

person 1, person 2, person 6 (H)

person 4, person 3, person 7, person 8 (L)
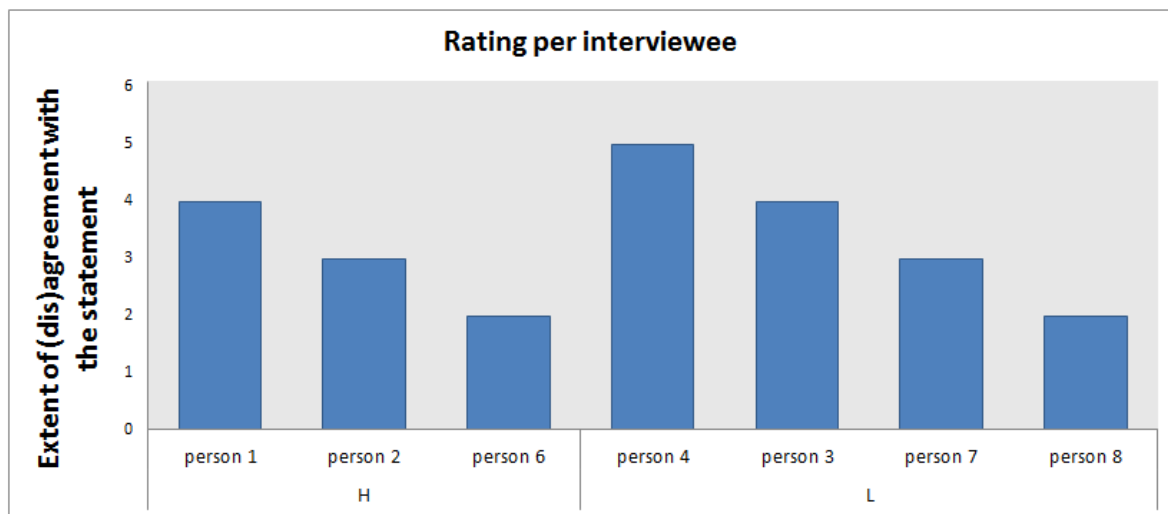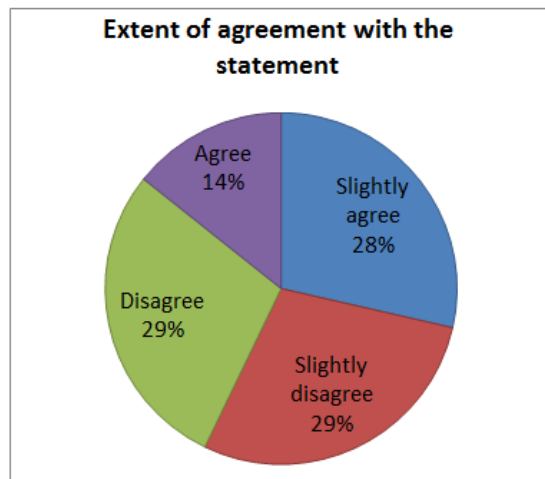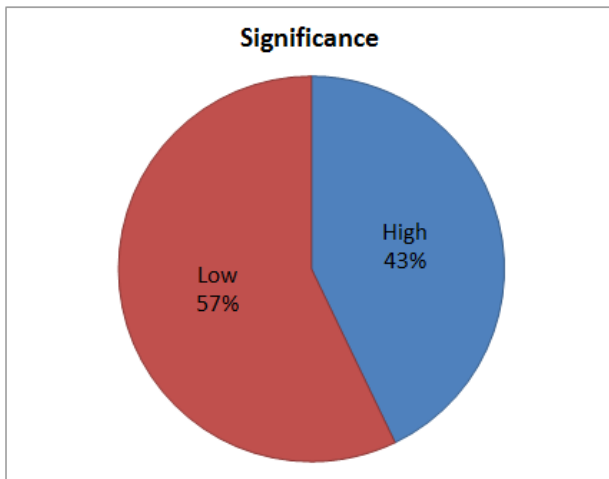
Question 17

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
17	General	Quality of service/Efficiency	My employee received, basic, hard skills and soft skills training within their first year of employment	3.9	75%	25%

Significance

Low
25%

High
75%

Extent of agreement with the statement

Disagree
13%

Slightly disagree
12%

Agree
25%

Slightly agree
50%

Rating per interviewee
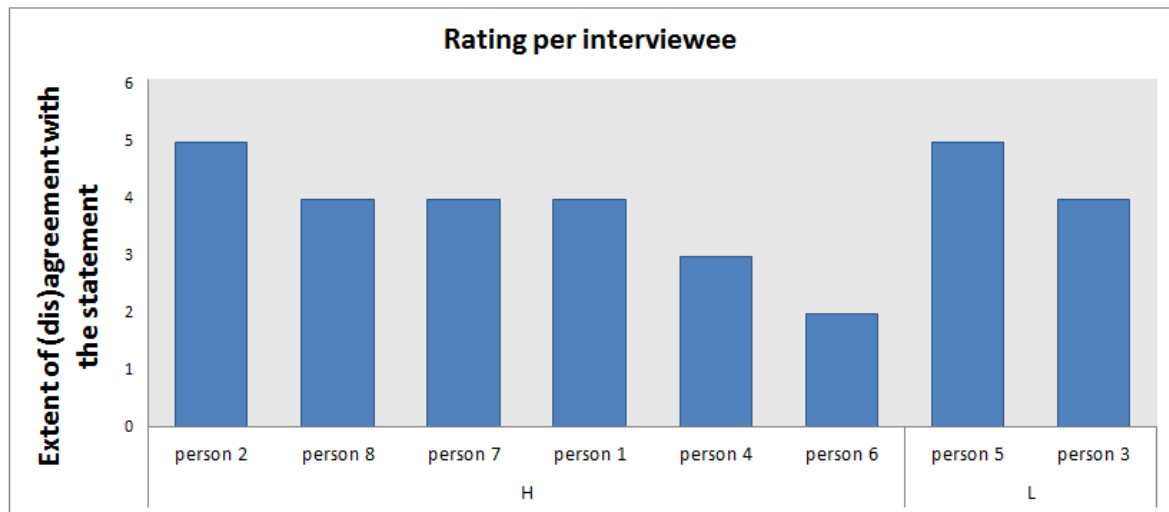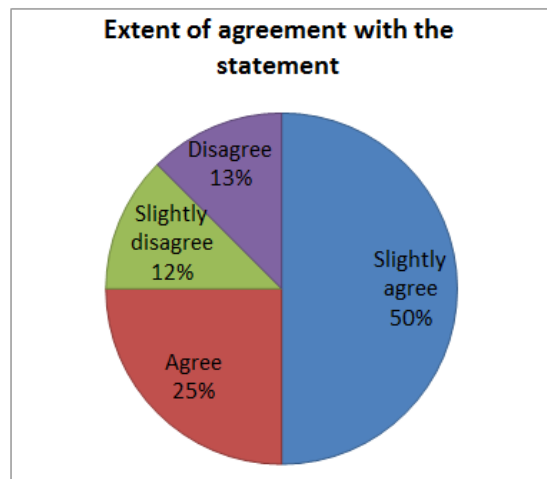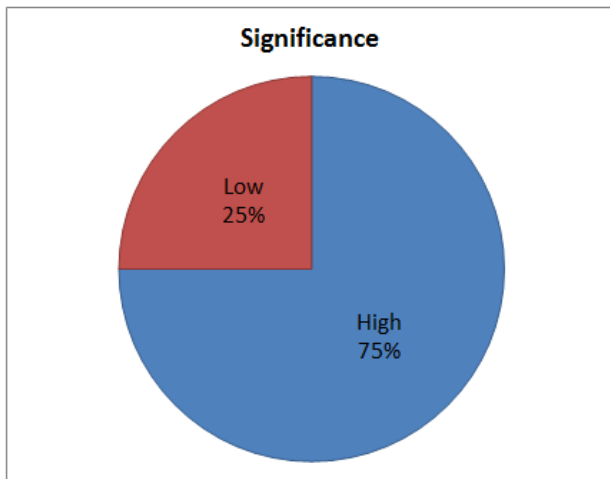
Question 18

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
18	General	Quality of service/Efficiency	HR proactively supported my new employee in getting to know organisational environment and company culture.	2.4	86%	14%

Significance

Low 14%

High 86%

Extent of agreement with the statement

Strongly disagree 14%

Disagree 29%

Slightly disagree 57%

Rating per interviewee

Extent of (dis)agreement with the statement

person 7 — 3
person 1 — 3
person 2 — 3
person 3 — 3
person 6 — 2
person 4 — 1
person 8 — 2

H

L
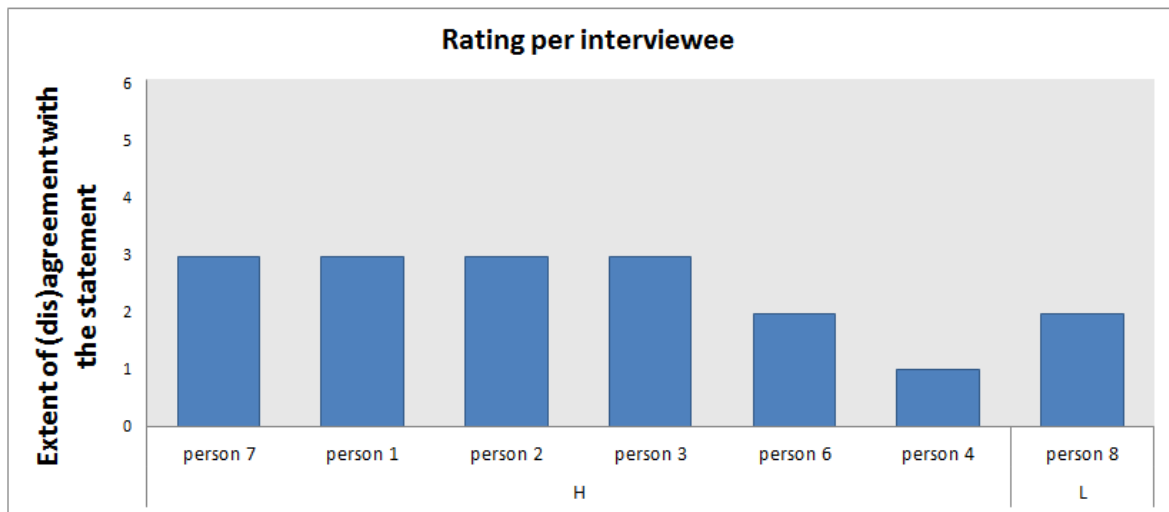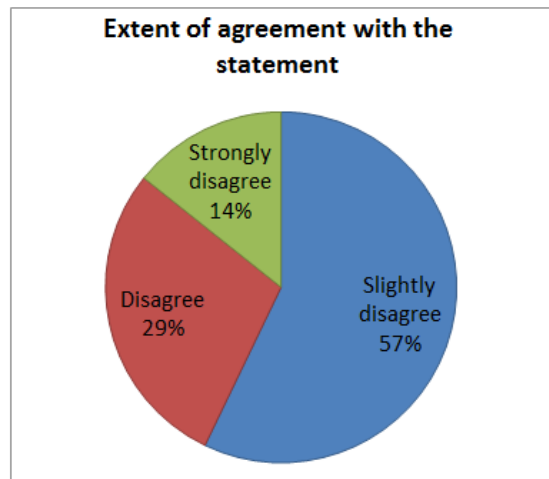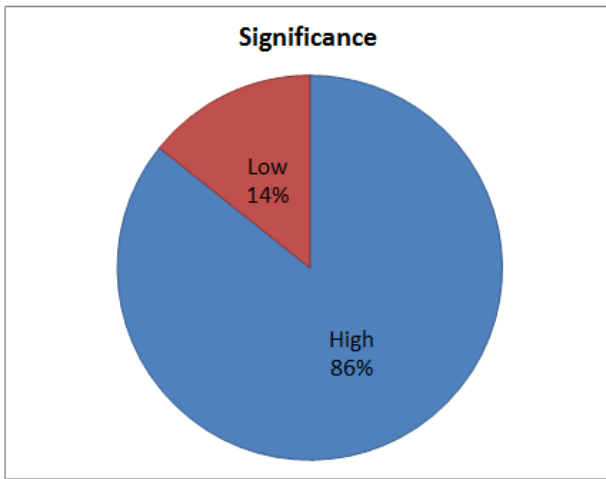
Question 19

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
19	General	Roles clarity/Process steps clarity	I was clear about the roles and responsibilities in the recruiting and onboarding process (it was also clear to me, who is responsible for which topic whitin the HR department)	3.4	75%	25%

Significance

Low 25%

High 75%

Extent of agreement with the statement

Slightly agree 13%

Agree 13%

Disagree 13%

Strongly agree 12%

Strongly disagree 12%

Slightly disagree 37%

Rating per interviewee
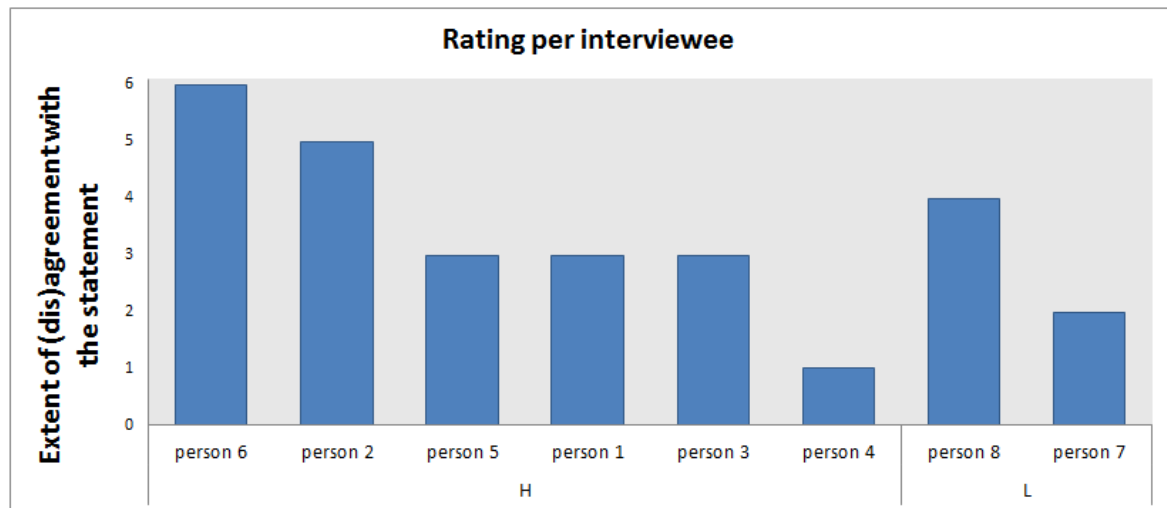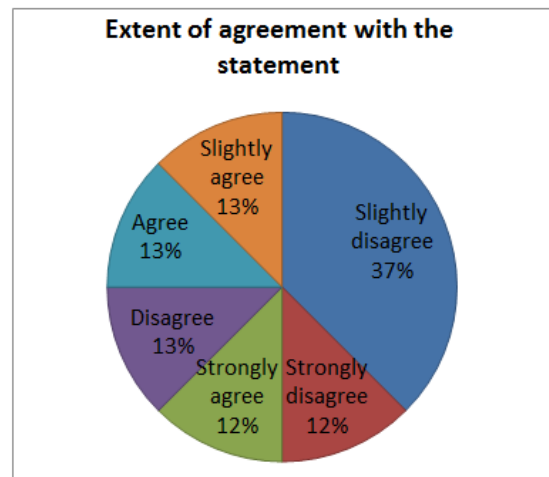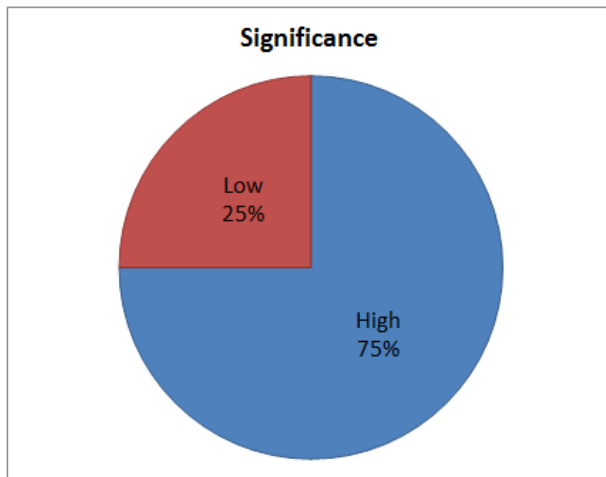
Question 20

No	Group	VOC Questions cluster	Question	AVG Rating	Significance High [%]	Significance Low [%]
20	General	Roles clarity/Process steps clarity	It was always clear to me when action from my side was required in the recruiting and onboarding process	4.3	63%	38%

Significance

Low 38%
High 62%

Extent of agreement with the statement

Strongly agree 13%
Slightly agree 37%
Slightly disagree 25%
Agree 25%

Rating per interviewee
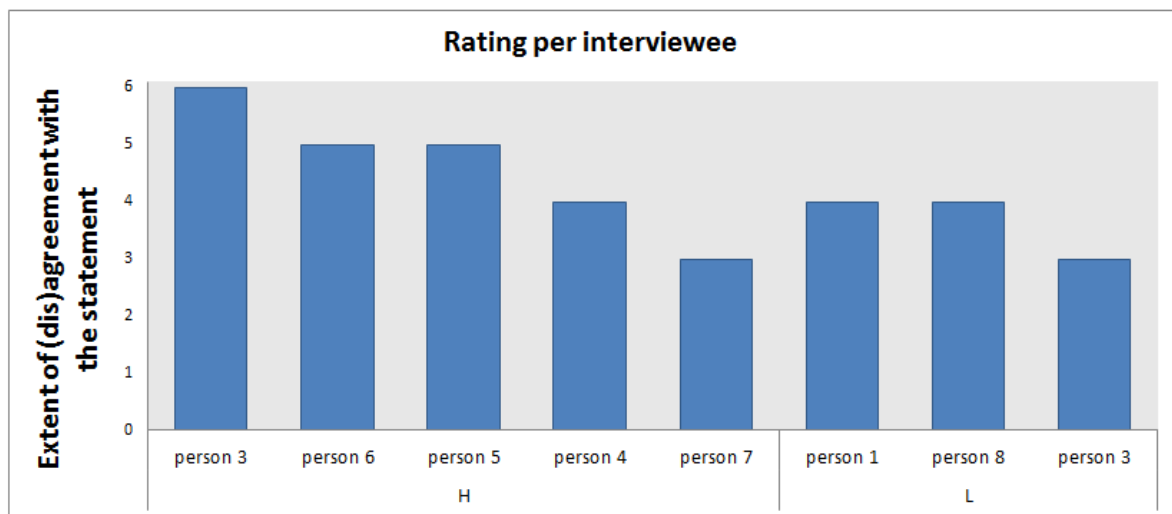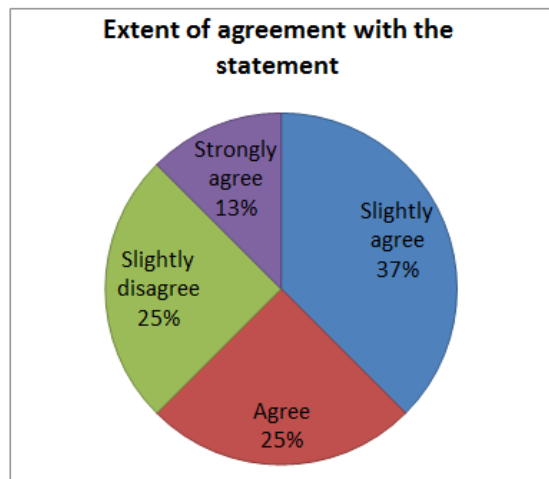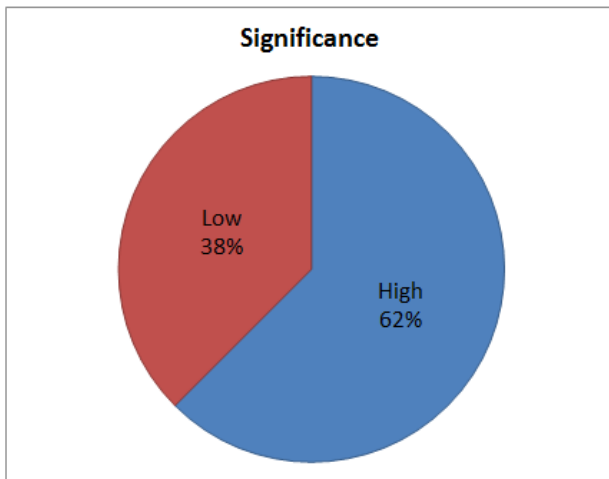
Results of open questions:

What is the most important for you, as a customer, in the recruiting and onboarding process?	What do you like/dislike?
The selection process must be done in advance. I have rated the questions above as I see it, working not only with HR of daughter company A but also with HR of daughter company B.	I dislike that every plant unit is doing it differently. We need a group-wide approach.
It is important is that the recruiter is active in the interview. That is definitely the case in Country A, but in Country B recruiter is even not participating the interviews.	Like: Friendly support
I would also appreciate if we have a group-wide common process, which is used by all plants.	Dislike: Candidate network -- e.g. similar to consultant business (workshops at universities, Master studies…), professional recruiting services (has improved with Person A, but Person A is not the whole department :))
To find proper candidates soon/fast	Over the last couple of months I can see a strong will to improve
To fulfil the requirements always e.g. timeline, competencies, location, etc.	The process for the apprentices in the past was too slow and very bad support from the past responsible Person W from HR. But all other recruitments from my side were o.k. I got very good support from Person Y. And I hope the apprentice-recruiting process can be done faster for this year.
At the moment there is not the right process in place. Use the available resources considering the cost factor.	DISLIKE:
Clear roles/quick response and support. Structured onboarding process regarding information on organisational structure, quick overview, etc.	- It is not necessary that HR participates in all interviews - should only be involved in the final round.
I like the recruiting process with Recruiter A - it's like playing Ping-Pong on a high level. What needs to be improved is introducing the new employee within the first days/weeks on a general level: plant tour, etc.	- Discussions about when and what to offer (especially when HR wants to offer more than I wanted).

To get the service from a professional. E.g. external consultant should be recommended and it cannot be that I have to select. Sometimes I have the feeling we are working on a "let's try" approach. A structured approach and standard templates for judgment would be the minimum. I expect HR to take the lead from request to onboarding e.g. including informing candidates if they are not hired.	- Head-hunter (Person C) was too slow - for important positions it would be better to arrange two head-hunters but with a success-fee-only approach.
Recruiting process must be done as fast as possible	
Responsiveness, clear responsibilities, good preselection, professional support along the process	
Clear segregation of duty: Who is responsible for which decision!	

Appendix C: Project Charter

PROJECT CHARTER

Onboarding process – Process improvement project

Project level: C – Department project

Project goal

- To merge the recruiting and onboarding process into one – as per best practice
- Clarify/define roles and responsibilities of parties involved in the process
- Shorten the time from recruiting requisition to filling a vacant position and successfully finishing onboarding
- Provide tools and methods for better quality of the process
- Standardise and formalise communication of the stakeholders/parties involved
- Clarify/define process steps, inputs and outputs (eliminate "waste" activities, minimise "non-value-added" activities)
- Define KPIs
- Scope of the project – Recruiting and onboarding processes within the responsibility of the HR Corporate team

Non-scope

- Optimisation of any HR process other than the recruiting and onboarding process optimisation (e.g. training plan)
- Contents of the documents (e.g. training materials used in the onboarding process)
- Rollouts to other locations within the Holding of Company A

Define qualitative benefits

- Improve efficiency and quality of the process
- Shorten time from starting point of the process to conclusion of onboarding
- Clear roles and responsibilities

Measurable Objectives – CTQs

- Decrease unnecessary loops in the process by 25% (estimated EUR 65,000 in savings).

- In addition, reduction of external costs by 20% (estimated EUR 40,000 in savings).

Customer	Need (Level 1)
Hiring manager, department manager, second level manager	Qualified and productive new employee for reasonable cost in time

Need (Level 2) = Driver	Need (Level 3) = CTQ/CTS	Metric	Target
Service Quality	Preselection by recruiter	Preselection by recruiter done (YES/NO)	YES
	Matching cantidates - First year retention rate	Number of still active new hires per month in this FY/Number of new hires in the same month in previous FY)*100	Retention rate of new hires in their first year of employment should be ≥ 90%
	Onboarding successfully done	My employee received, basic, hard skills and soft skills training within his/her first year of employment	YES
	Clear responsibilities and process steps	Onboarding process in in writen form - formalised and in Management manual	YES
	Improve service quality	Customer satisfaction improvement: Average customer sarisfaction of highly important onboarding elements	Coefficient of highly significant elements for the customers higher than than 4.
Cost	Costs of external protals/search/agency	Forecast correctness= (actual costs/forecasted costs)*100	80 > Foreceast correctness < 120%
Time	Time to Hire (TTH)	Number of days for recruitment= end date-start date	For job family 10-30: 90days For job family 40-60: 150 days For job family: 70-90: 180 days

Internal PD[22]

- Project manager HR 20 PD
- HR Specialist 5 PD
- Head of corporate recruiting 2 PD
- Controlling department manager as a representative of customers (hiring managers) 1 PD
- Director HR Corporate 1 PD
- HR Country A department manager 2 PD
- Head of HR Administration Country A 1 PD

Milestones

Start date: 24.2.2016

Define: 22.4.2016

Kick-off: 13.5.2016

Measure: 30.7.2016

Analyse: 31.8.2016

Improve: 24.9.2016

Control: 5.11.2016

Lessons learned and summary: 23.11.2016

End date: 30.11.2016

Project sponsor

- Director HR Corporate

Project manager

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[22] PD stands for "Person days".

- Project manager HR

Steering committee

- Group CEO
- CEO of Business Unit X
- Director HR Corporate
- CFO of Business Unit Y

Project deputy

- HR Specialist

Project team

- Core team
    - o HR Specialist
    - o Head of Corporate recruiting
    - o HR Austria department manager

- Advanced Team
    - o Controlling department manager as a representative of customers (hiring managers)
    - o Head of HR Administration Austria

Appendix D: Makigami process map

Part 1 – Process steps and responsible functions

Persons / departments involved	1 Create job description for position	2 Align content information needed to create recruitment requisition	3 Initiate approval workflow of recruitment requisition	4 Request bids of headhunters and job posting platforms/social media	5 Alignment with Hiring Manager on sourcing channel (Headhunter, internal, external) & costs	6 Set up and text posting aligned with hiring managers	7 Publish job posting internal, company homepage, job platforms, media	8 All incoming applications receive acknowledgement receipt --file resumes	9 Preselection and candidate rating of internal/external candidate profiles, assign/send suitable profiles to Hiring Manager	10 Schedule & invite suitable candidate for interviews + interview execution (phone/video/f2f)
Hiring managers	E	E	C, D		D	D		I	D	C
Disciplinary superior	D/C	D	D		D				C, I	
Department manager										
Recruiter	I	C	E		E	E	E	E	E	E
HR Manager/HR Director		C/(D)								
HR Specialist		C								
HR Local		C								
HR Asistant								C		E,C
Headhunter					I/C					
Recruiting agency					I/C					
IT										
Candidate										
BOM										
Purchasing										
EHS responsible										
Logistics										
Expat manager										
Communication department										

Persons / departments involved	11 Request NDA (for certain positions only)	12 Rate candidates to define shortlist for final interview/hearing	13 Schedule & invite & Perform 3rd interview + the final hearing	14 Draft offer data for contract	15 Offer	16 Contract	17 Contract signing (by AT&S and candidate)	18 Communication of offer withdrawal (in case candidate rejects offer)	19 Inform remaining candidates (reject/keep on file)	20 Request, get and store candidates' official documents for legal employment
Hiring managers		D	C,D	D				I		
Disciplinary superior		C	D	C				I		
Department manager			C							
Recruiter		E, D	E	E	E	C		E	E	E
HR Manager/HR Director				C				I		
HR Specialist										
HR Local				E		E		I,E		E
HR Asistant									E	E
Headhunter									C	
Recruiting agency									C	
IT										
Candidate								E	I	C
BOM			C	C						
Purchasing										
EHS responsible										
Logistics										
Expat manager				E				I	E	E
Communication department										

Persons / departments involved	21	22	23	24	25	26	27	28	29	30
	Close requisition	Draft/align and send out the announcement about new employee (with picture)	Enter a person to SAP	HR Specialist (US, D) or HR Local creates a Job ID into LN database	Information (e-mail) to hiring manager to start preparing the working place of the new employee	Information (e-mail) to candidate about when and where to arrive the first working day	Information (e-mail) to relevant colleagues about when a new employee arrives on his/her first working day	Administrative arrangements for new employee (informing workers council, agreement about part time - if applicable, information to health insurance...)	Administrative arrangments for new employee f.ex chair, table, business cards...)	Administrative arrangments for new employee - company car
Hiring managers		C (confirm)			I		I			
Disciplinary superior										
Department manager							I			
Recruiter	E	C (initiate)	C	C			I			
HR Manager/HR Director										
HR Specialist				E						
HR Local			E	C	E	E	E, I			E
HR Asistant										
Headhunter										
Recruiting agency										
IT							I			
Candidate			C			I				
BOM										
Purchasing										
EHS responsible							I			
Logistics										
Expat manager				C						
Communication department		E								

Persons / departments involved	31 Preparation of working place - Computer, software requests, shared drives, e-mail address, entry to the company phonebook, landline phone number, Iphone..	32 1st working day - hand over entry card /card for recording the time, explaining clock in/out machine, handing over documents to the candidate to sign	33 1st working day - EHS training	34 HR Manager welcomes new employee (if not available then recruiter or HR director)	35 Personal introduction of new employee	36 Initiate IPM Workflow and execute IPM with the employee	37 Make a training plan together with the new employee	38 Organize basic training and invite the candidate to the basic training
Hiring managers	E	E (request)	E (request)				E	C, E (for JD upload and IPM execution)
Disciplinary superior								
Department manager								
Recruiter						C		
HR Manager/HR Director						E		
HR Specialist								E (for initiating workflow)
HR Local	C			E				E (for initiating workflow)
HR Asistant								
Headhunter								
Recruiting agency								
IT			E (arranging the tools and accesses)					
Candidate								C
BOM								
Purchasing	C							
EHS responsible					E			
Logistics		E (Providing the car as per policy)						
Expat manager								
Communication department								

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Part 2 – Process steps, duration times, problems and potential solutions[23]

	1	2	3	4	5	6	7	8	9
Persons / departments involved	Create job description for position	Align content information needed to create recruitment requisition	Initiate approval workflow of recruitment requisition	Request bids of headhunters and job posting platforms/social media	Alignment with Hiring Manager on sourcing channel (Headhunter, internal, external) & costs	Set up and text posting aligned with hiring managers	Publish job posting internal, company homepage, job platforms, media	All incoming applications receive acknowledge ment receipt --file resumes	Preselection and candidate rating of internal/external candidate profiles, assign/send suitable profiles to Hiring Manager
Data carriers, information media	Phone, E-Mail, f2f	Phone, LN Org. database, SAP, E-Mail, f2f, RMS (recruitment management system)	RMS	**Information media**			RMS	RMS	RMS
Total duration (clock) DAYS	2	2		**Total duration**			2	30	30
Action time (value adding + losses) MINUTES	180	90	3	**Action time**			230	100	100
Value-adding time MINUTES	110	50	3	**Value adding time**			200	80	90
Problems	Job descriptions are not standardized (template YES, content NO)	No workforce segmentation - Poor group comparison (chair poor for new job created/benchmark) - No job title policy - Not enough standardized compensation and job-grading system - Working hour model	Complicated (VOC feedback)		Sometimes the services of ext company are not good quality (VOC)		No integration between RMS and job platforms (no automated parting/deleting possible)		Preselection not done sufficiently by HR – applicable for same position (VOC feedback)
		Expat and int. hirer – allowances (alignment with expat management – policies do not match India)		**Problems**	Not enough cooperation of hiring managers.		No contract management (system) for job platforms		
		Many different people involved. All of these people have only part of information. No common information source (SAP, LN).					No "recruiter account" on Linked-in and like		
Possible solutions	To standardize job descriptions (to some extent) for major profiles (tasks/responsibilities/requirem ents standardized + open text fields for additional responsibilities) + WFS	Execute workforce segmentation project	Complexity reduced with implementation of proc. Tool		Expectations of the customers		To integrate RMS with external job platforms		
	After standardization of JDs, a common, easy accessable JD database	Adjust the policy for India		**Solutions**	To make a template: list job boards, list costs, cost center, get approval		To be able to contact potential candidates via professional account on Ln and like		
		Recruiter has to be "one face to the customer" (except create new job in LN)					Analytics about parting channels performance		
		Expats and international hires in SAP							

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[23] The purpose of Appendix D – Part 2 is to show the structure of the Makigami map. As per the guidelines of Company A, the content cannot be disclosed and published as the presented solutions are a business secret. Therefore, we intentionally used small text fonts.

Appendix E: Activity Structure Analysis

Step in Makigami	Activity	Step in Makigami (No.)	Comment or Sub step	Core/Secondary/Organisational	Duration in Minutes	Probability (in %)
Requisition	Organise meeting with Hiring Manager	**2**	calls, mails, day time check	S	10	100
	Meeting with Hiring Manager	2		C	60	100
	Align requisition data with Hiring Manager	2	call, mails	C	10	100
	Align job profile with Hiring Manager	2		C	30	100
	Require job description	2	mails	S	5	100
	File job description, update	2		O	3	100
	Collect information on requisition data needed	2	Perform Salary Benchmark (see below)	S	30	100
		2	Job Family, Job Code (research Organisational database)	S	8	100
		2	Collective Agreement Data	S	5	80
		2	Historic Salary Data	S	5	25
		2	Time model	S	2	100
	Calls, mails, conversations related	2		O	30	100
Salary Benchmark	*Perform salary benchmark for peer group*	2	Perform location/industry salary benchmark for new positions	S	180	10
		2	Perform salary benchmark within peer group in local environment (Country A, Group)	S	60	70
		2	Perform salary benchmark within peer group in international environment (Expatriates, International Hires)	S	150	30
	Inform Hiring Manager on salary benchmark and suggest compensation package	2	Call, mail	C	20	100
	Discuss compensation package	2	Call, mail	C	40	100

	Get approval of Hiring Manager/Superior/Board for compensation package	2	Set up & align collective agreement	S	15	100
	Calls, mails, conversations related	2		O	30	100
Publish Job posting	Finalise and adjust posting text internal (pdf)	6		C	30	100
	Finalise and adjust posting text external (pdf)	6		C	20	100
	Fill in posting text in e-recruiting management system	6	Text English / text German	C	30	100
	Post to internal e-recruiting management system career portal	6		C	3	100
	Finalise internal announcement	6	Define target group	C	30	100
	Inform worker's council (Country A)	6	Discuss opening	S	5	80
		6	Send information emails	O	2	80
	Get approval for internal announcement	6		S	5	100
	Post to external e-recruiting management system career portal	6		C	3	100
	Request offers for job boards	6	Local, corporate, prices, get approval for costs from Hiring Manager	S	30	70
	Assign media agency for posting	6	For corporate postings	S	3	30
	Post on job boards	6	Karriere.at	C	10	90
		6	LinkedIn	C	30	100
		6	Xing	C	5	60
		6	AMS (AT, Germany) – in cases candidates are out of EU	C	10	30
		6	Newspapers/career guide/academic guide	C	720	20
		6	Indeed	C	15	30
		6	Print and publish on black board (for blue collar workers)	C	15	100
		6	Send to organisations, universities…	C	20	30
		6	Stepstone	C	5	30

		6	Monster	C	5	30
		6	Head-hunter/Agencies	C	20	40
	calls, mails, conversations related	6		O	30	100
Interview planning and execution	Set up interviews (tests, hearings, assessments, …)	9	Align dates with Hiring Managers, Superior	C	15	100
		9	Set up mail invitation internal (check global time zones)	C	5	100
		9	Call candidates align interview dates	C	5	100
		9	Make room reservations	S	10	60
		9	Travel arrangements for candidates	S	60	50
		9	Met up video conference system, rooms	S	15	60
		9	Set up WebEx videoconference	S	5	60
		9	Set up e-mail invitation for candidates	S	4	100
		9	Reassure with candidates, reminders	S	5	90
		9	Set up interview dates in e-recruiting management system	O	5	100
		9	Line tour organisation	O	20	20
		9	Reschedule - start planning process again	O	149	20
	Welcome candidates at reception	9		C	10	40
	Perform interview	9	Face to face, conf. calls, WebEx, video conference	C	75	100
	Perform hearing	9		C	120	30
	Perform assessment	9		C	480	5
	Maintain data in e-recruiting management System	9	Scan and upload interview notes in e-recruiting management system, file on server	C	7	100
	Maintain data in excel	9		O	3	100
	Calls, mails, conversations related	9		S	30	100

Appendix F: Muda hunt checklist

No.	Verbal description of Muda type	Open questions
1	Overproduction	
2	Conveyance/transportation	Why do we not have enough integration between IT systems?
		Why can use of multiple workflows not be optimised?
		Why do the documents have to be printed out and delivered in paper form although they exist in the IT system?
3	Waiting	Why are more process steps not done simultaneously?
		Why is so much waiting caused by unclear roles and responsibilities?
4	Failures / Loops	Why are our job descriptions not standardised?
		Why do we have no standardised/structured templates for the hiring manager to make evaluations at the interview?
		Why do we have too many different contract templates?
		Why are our contract templates not up to date and unified?
		Why do so many loops happen due to unclear roles and responsibilities?
		Why is the training plan for new employees not standardised?
		Why are hiring managers not better trained in interview execution?
5	Underutilised people	Why are more administrative tasks not done by internships, but are performed by more expensive staff?
6	Inventory	Why do we print out resumes of rejected candidates and store them in the cupboards?

Appendix G: Ishikawa diagram

Time zones/time differences

ENVIRONMENT

Not attractive locations

Visa restrictions

Geographic
environment

Building architecture

Not enough descreet meeting
rooms for interviews
(confidentiality!)

No quiet working environment

Office
infrastructure
and design

No social space

No coffee areas

INDUSTRY

Niche industry

aging industry

fast-paced business
environment

no work security
guaranteed

identification with the product
needed

Demographic
changes

millennials on
workforce market

meaningful jobs needed

**WHY IS IT HARD TO
FIND MATCHING
CANDIDATES FOR SOME
OPEN POSITIONS?**

No career paths offered

Company
general

Circumstances for
work-life balance

Not enough home office oportunities

Working time not flexible enough

Limited mobility of candidates

Language knowlege

Intercultural differences

Minimum employer
branding

No investment to
empl. branding

Employer brand
not strong

B2B business

Lack of appropriate education

Little flexibility

Not enough internal HR staff to do sourcing alone

Resources

Restricted bugets and investments

COMPANY

CANDIDATES

Appendix H: Mind Map

Appendix I: Activity list[24]

No.	Activity	Who?	With whom?	Until when?	Status	Done at	Comments
1	Adjust roles and authorisations of HR/IT systems						
2	Easy to read flow chart to understand the process steps and responsibilities						
3	Investigation about possibilities of integration between recruiting management system and job platforms						
4	"Recruiter accounts" on LinkedIn, Xing (Person A will invite contact person of LinkedIn for the meeting. To include communication department)						
5	"How to interview" trainings to be executed for hiring managers (Labour law and interview technique for managers – Person A and Person B)						
6	Review and update contract templates						
7	"Starter Package" for IT accesses workflow to be made						
8	Training plan for white collar to be more standardised						
9	"Welcome to the our town" brochure						
10	Meeting with IT about Job description access possibilities						
11	Ask Person C if she needs a template for "create new job"						
12	Prepare a template for hiring manager for competency rating in interviews						
13	To adjust the policy for Country D						
14	External job postings - Make template: list job boards, list costs, cost centre, get approval						
15	Interview execution trainings for managers by recruiter						
16	Standardise scorecards for rating (for hearings/assessments)						
17	Optimise contract templates, optimise attachment templates.						
18	First day welcome e-mail to rework						
19	Info mail about new employee's first working day - rework text and check distribution list						
20	To talk to Person E about date specific reminders (probation period expired)						

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[24] The actual names of the people involved, town and company name are not stated as per the request of Company A.