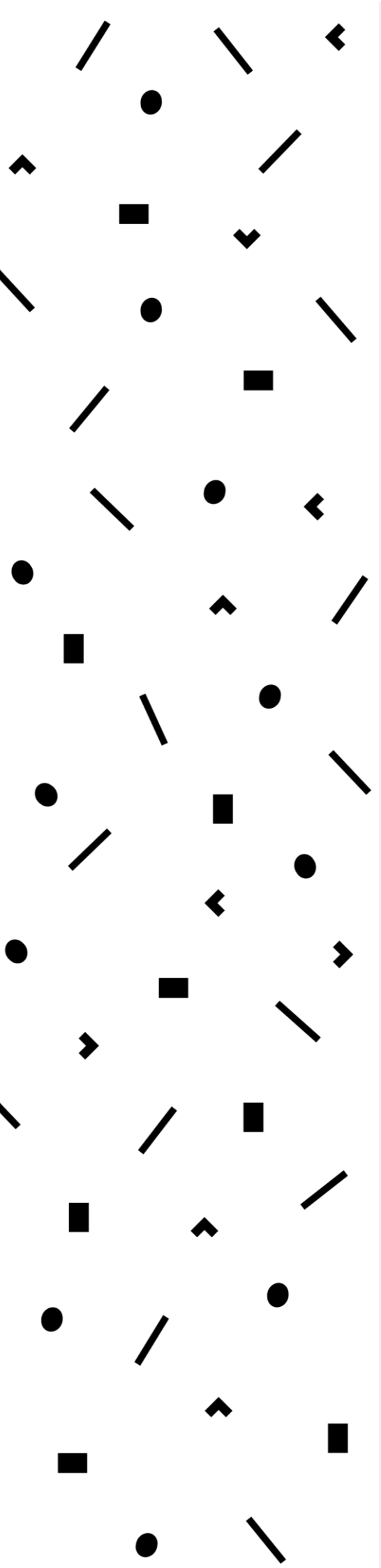

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DEVELOPMENT OF THE IT RESOURCES DIRECTORY

Case Company: local global GmbH

LAHTI UNIVERSITY OF APPLIED SCIENCES
Faculty of Business Studies
Degree programme in International Business
Bachelor Thesis
Autumn 2016
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Degree Programme in International Business

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Development of the IT Resources Directory

Case Company: local global GmbH

Bachelor's Thesis in International Business, 103 pages, 6 pages of appendices

Autumn 2016

ABSTRACT

Manufacturing and production industries are going through a digital transformation due to the implementation of Information and Communication Technology (ICT) into business operations. This digitalization process is called Industry 4.0, the fourth industrial revolution. Outsourcing is presented as the way for German companies to find qualified foreign Information Technology (IT) providers, who can help companies keep up with Industry 4.0 by automating their IT sectors.

The researcher introduces the IT Resources Directory, which is the case company's matchmaking platform for German firms and international IT providers. The online version of the IT Resources Directory is evaluated based on the website quality assessment criteria. Using Business Model Canvas (BMC), the goal of the research is to complete the development plan for the IT Resources Directory and provide suggestions for further improvement.

To conduct the study, the researcher uses deductively based research approach and both qualitative and quantitative research methods. Secondary data is gathered using credible literature and Internet based sources. Primary data is obtained via a survey and an interview conducted at the business trade shows. The main finding states that many German companies are reluctant to outsource IT services to third parties abroad. However, given the online IT Resources Directory is fully developed, it may nevertheless be a useful tool for finding foreign IT providers and creating mutually beneficial partnerships.

Key words: Industry 4.0, outsourcing, German companies, IT providers, matchmaking, IT Resources Directory, qualified employees

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ABBREVIATIONS

ICT	Information and Communication Technology
IoT	Internet of Things
IT	Information Technology
OECD	Organization for Economic Cooperation and Development
CeBIT	Centre of Office Automation and Information Technology and Telecommunication
SMEs	Small and Medium Enterprises
IPAs	Investment Promotion Agencies
BMC	Business Model Canvas
CPS	Cyber-Physical Systems
M2M	Machine-to-Machine
R&D	Research and Development
BPO	Business Process Outsourcing
KPO	Knowledge Process Outsourcing
AMB	Exhibition for Metalworking
URL	Uniform Resource Locator

1 INTRODUCTION

The first chapter familiarizes the reader with the background of the research and describes the methods used to conduct it. Moreover, the objectives of the study are presented, and the research questions and limitations are set.

1.1 Research Background

Around the world, traditional manufacturing industry is going through the digital transformation due to exponentially developing technologies such as 3D printing, sensors, intelligent robots and autonomous drones. Companies have to adopt their industrial processes to such a rapid change in order to be competitive on the market. The widespread implementation of Information and Communication Technology (ICT) by the manufacturing industry forces them to develop new disructive approaches in production processes and logistics chains. (Schlaepfer & Koch 2015, 1-3.) A physical world is turning into the information system due to the developed sensors and actuators that are embedded in physical objects. Thus, they are linked through wired or wireless network connections. Such networking received the name 'Internet of Things'. (Löffler & Tschiesner 2013.) The industrial revolution which connects the worlds of production with network connectivity in the 'Internet of Things' (IoT) is introduced as Industry 4.0 (MacDougall 2014, 4). In other words, Industry 4.0 is the digitalization of the manufacturing sector (Baur & Wee 2015, 4).

Germany has suitable conditions to become a global leader in the internet-based production technology, because it has the leading position in embedded systems, business enterprise software and security solutions (MacDougall 2014, 7). However, there are worries in the country that digitalization might become a threat to its industrial leadership due to adaptivity and security issues as well as lack of Information Technology (IT) providers, who are ready to compete in the world of software and data (Germany's Industry 2015). Germany has high quality standards in higher

education in the fields of sciences, mathematics, computer sciences, and engineering, according to the Organization for Economic Cooperation and Development (OECD) (Troillet 2016, 5). German computer scientists are very well educated and capable to build highly reliable systems, however, they do not adapt to the new situations quickly and do not tend to take risks. These characteristics are of a major importance at the stage of Industry 4.0. “The battle for industrial platforms will be a fight between German precision and American speed.” (Westerkamp 2015.)

Lack of suitable human resources in the area of IT is a critical issue that Germany has to solve. In general, if the country does not have the necessary resources, it buys them from other countries. Therefore, German companies have started to look for IT providers outside the country. (bvblogic 2016.) In other words, German companies have started to practice outsourcing, which is the procurement of services under the contract with an outside supplier (Merriam-Webster 2016). In order to investigate the success of this practice, this research is conducted.

The researcher performed an internship at the company local global GmbH, Stuttgart, which specializes in conferences, marketing and publishing. One of the most important fairs, in which company regularly participates, is Centre of Office Automation and Information Technology and Telecommunication (CeBIT) (Translated from German by CeBIT organizers). This is one of the biggest international ICT exhibitions in the world. Hannover Exhibition Grounds brings together Small and Medium Enterprises (SMEs), big players, professionals, Investment Promotion Agencies (IPAs) and government representatives from different countries in order to present and discuss the latest trends in hardware- and software innovations. (CeBIT 2016.) localglobal GmbH has many contacts of IT SMEs from abroad collected on this event. This is the reason why the company came up with the idea of the IT Resources Directory, which is essentially a guide for German enterprises to find potential IT providers outside of Germany.

The idea of the IT Resources Directory is to locate profiles of IT firms outside Germany, and place all of those profiles in one publication called ‘IT Resources Directory’. A printed version of the Directory is distributed directly to German enterprises, who are looking for international IT providers. At the same time, the company is developing the online version of the IT Resources Directory. The online version represents a website with a search function. On this website German companies can search for different kinds of IT providers outside of Germany. The website generates a list of IT providers and the services they offer, based on the user’s specifications. (localglobal 2016.)

The researcher was asked to provide ideas of how the printed and online versions of the IT Resources Directory can be developed so that German enterprises can use it to look for foreign IT providers. For that reason, ‘Development of the IT Resources Directory’ is chosen as the topic of the research.

The IT Resources Directory is a tool, which connects two parties: German companies and IT providers outside of Germany. The act of bringing two parties together to facilitate a sale or other transaction is called matchmaking. To help SMEs find cooperation partners abroad and build up a network, matchmaking platforms have been established. (Stolz 2006, 53.) In this study the author defines the IT Resources Directory as a matchmaking platform for two parties: German enterprises and foreign IT providers. The case company localglobal GmbH is the organizer, or matchmaker, helping these two parties meet.

1.2 Thesis Objectives, Research Questions and Limitations

The study aims to provide a deeper understanding of Industry 4.0 and the outsourcing as the possible solutions for companies to stay competitive during the new digitalization revolution. The goal of the research is to understand German enterprises, their needs and their attitudes towards outsourcing practices. Another goal is to conduct the internal investigation of the current development stage of the IT Resources Directory, and offer

the case company ideas for developing the product further. The purpose is to determine whether the IT Resources Directory has the potential to meet and satisfy the needs of the German companies. The objective is to give suggestions as to how the IT Resources Directory should be developed to attract German companies and have them use this product. Therefore, the research question is set as follows:

How can the case company develop the IT Resources Directory to meet the needs of German companies?

In order to meet the objectives and answer on the research question, sub questions are defined as follows:

- What is Industry 4.0 and how does it affect companies' operations?
- What is outsourcing?
- What is matchmaking and the role of the case company in this process?
- What are the needs of German companies during Industry 4.0 development?
- What is the attitude of German companies regarding outsourcing?
- What is the current developmental stage of the IT Resources Directory?

The research is conducted to understand whether German companies are willing to outsource IT services from abroad and to understand the best possible way to make the IT Resources Directory a trustful resource for them. At this stage, it is important to determine the limitations of the study. Limitations are matters, factors or conditions that limit the extensity of a study. Sometimes they can affect the results of the research. Therefore, it is necessary to determine the limitations in the beginning of the process in order to identify to which extension a research can go, what aspects it does not cover, and to give a truer sense to a reader between what variables the research is conducted. (Silverman 2014, 5; Simon & Goes 2013, 1.)

Firstly, the companies that are investigated in this research are German. Therefore, the thesis may not provide any reliable information regarding companies from other countries. Secondly, when it comes to the IT Resources Directory, there are two categories of customers. The first group consists of IT providers who want to cooperate with German companies and, thus, reserve a spot in the directory. The second group consists of German enterprises which want to outsource IT services. These customers may use the Directory as a tool. This research aims to understand the needs of the second group only, German firms. The study does not provide any valid data about international IT providers and their opinion regarding the IT Resources Directory. Thirdly, the study focuses only on IT outsourcing practises and for that reason does not provide any information about the outsourcing practices of other fields of business.

It is also necessary to point out that the term IT providers throughout the paper refers to the IT providers outside of Germany. German IT providers are not included in this term for this thesis.

All in all, the study provides valuable information about German attitudes towards outsourcing and helps the case company develop the IT Resources Directory based on customer analysis and investigation of the current development phase of the product.

1.3 Theoretical Framework

The core aim of the research is to help the case company develop the IT Resources Directory to attract German customers to make use of it. Before starting the development plan, there are several aspects which have to be addressed in order to understand the background of the research.

First of all, it is important to have a deeper understanding of Industry 4.0 as well as the opportunities and challenges caused by the new digital revolution. Therefore, these issues are introduced and explained in the research. One of the potential solutions for the case company to stay

competitive during the time of digitalization is outsourcing. The author discusses the term ‘outsourcing’ to make sure that the reader is familiar with this concept. The case company is introduced as a matchmaker, and the IT Resources Directory is presented as a matchmaking platform. The study explains the process of matchmaking and the role of a matchmaker. After that, the researcher introduces local global GmbH and its primary services. The theoretical part ends with defining Business Model Canvas (BMC). In the empirical part of the thesis the researcher uses BMC as a foundation to evaluate and analyse actions taken towards developing the IT Resources Directory.

1.4 Research Methodology and Data Collection

In order to conduct a study, there are several decisions to be made beforehand. The first step is to choose either the deductively based or inductively based research approach. The figure below illustrates the main idea of deductive and inductive approaches.

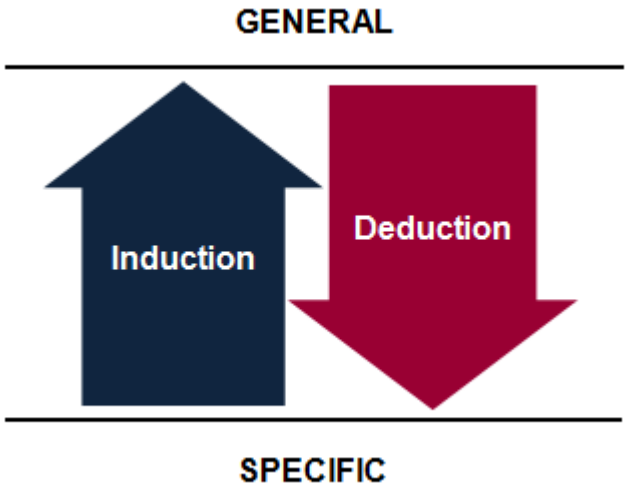

FIGURE 1. Deduction vs. Induction (modified from Kuder 2009)

Induction is used in a study to obtain a general theory from concrete statements and premises (Saunders, Lewis & Thonhill 2009, 500-502). It is an open-ended approach, where the main purpose is theory building (Myers 2013, 23). Deduction, on the other hand, focuses on analysing the

general theories to identify the specific solutions (Saunders, Lewis & Thonhill 2009, 502-505). This approach is narrower, and is used to test or confirm a theory (Myers 2013, 23).

The second step is to choose whether the qualitative or quantitative research method should be used. The latter is a systematic way to explain the phenomena using numerical data, and analyse it by mathematically-based methods and statistics. Through the use of diagrams and statistics the outcome of the research is numerical and standardized. The quantitative research method is used to test or acknowledge the issued topic and obtain the statistical result. (Laisi 2015; Yilmaz 2013, 48.) The qualitative research method, on the other hand, is a focused way to collect data, expressed by words, in order to gain in-depth understanding of the problem or phenomena. This method refers to the meanings, characteristics, definitions, as well as description of things and concepts. This is a process-oriented way of conducting the study. (Silverman 2014.) Table 1 shows the major differences between these two research approaches.

TABLE 1. Quantitative vs. Qualitative research methods (modified from Yilmaz 2013, 48; Myers 2013, 5-13; Laisi 2015)

	Quantitative	**Qualitative**
Emphasis	Testing/Acknowledgment	Understanding
Foundation	Meaning derived from numbers	Meaning expressed through words
Approach	Logical/Critical	Interpreted/Rational
Analysis Conducted	Through the use of diagrams and statistics	Through the use of conceptualization
Orientation	Result oriented	Process oriented
Results	In numerical and standardized data	In non-standardized data requiring classification into categories

The qualitative research method is more informative, and offers enhanced understanding compared to the quantitative method, which provides more scientific data, expressed with numbers (Tewksbury 2009, 39).

The idea of this research is to understand the German market and its attitude towards outsourcing the IT services to other countries. After gaining this information, the goal is to determine whether the product IT Resources Directory is a suitable solution to help German enterprises in their outsourcing practices. As the study proceeds from general understanding of the market, companies' needs to the specific potential solution as the IT Resources Directory, the deductive reasoning is suitable for the research. The qualitative research method is chosen, because the study is process-oriented, and is based on understanding. However, the quantitative research method must also be implemented in order to evaluate the gathered data.

The next step after selecting the suitable research methods, is collecting data. Data itself is a single piece of information, while research data is a factual material accepted in the scientific community used to answer on a specific research question and to validate research findings (O'Reilly & Kiyimba 2015, 130). There are two types of data: primary and secondary. The primary data is the original data collected for a particular research goal. (Hox & Boeije 2005, 593.) It is "face-to-face" collection of the information via interviews or surveys, for example (O'Reilly & Kiyimba 2015, 130). The secondary data is the data which was originally collected for another purpose and is being reused for different research question (Hox & Boeije 2005, 593). In other words, secondary data is the information which is gathered from existing available sources (O'Reilly & Kiyimba 2015, 130).

In this research, the primary data is collected using an interview with the German IT consulting company, and a survey conducted among German firms. The aim to gather the primary data is to understand the attitude of German companies towards outsourcing and their expectations from the partner they cooperate with. Moreover, part of the primary data is collected

by collaboration with the case company to evaluate the IT Resources Directory development.

The secondary data is as important in this research as the primary one. Secondary sources of information include trustful literature and articles, Internet based sources as well as prior academic studies.

1.5 Thesis Structure

In order to achieve the defined goal of this research and answer the research questions, the study is divided into eight chapters. The figure below illustrates the overall flow of the research.

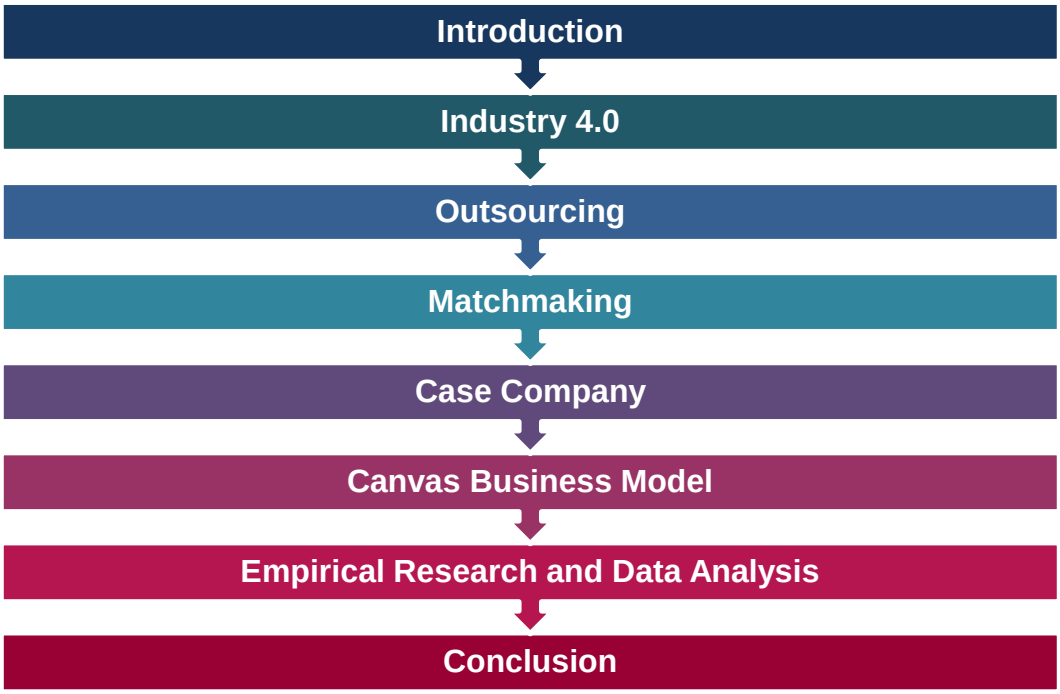

FIGURE 2. Thesis structure

The first chapter familiarizes the reader with the background of the research and explains its relevance. Moreover, the research objectives, limitations, and data collection methods are presented and explained.

The second chapter emphasises that the research is very timely due to currently developing Industry 4.0. In this chapter the study introduces the digitalization of the manufacturing process called Industry 4.0, and

describes its features, as well as opportunities and challenges it brings.

The following chapter presents outsourcing as the potential solution for German firms to stay competitive on the market during the digitalization revolution Industry 4.0. The author defines outsourcing and describes its types, benefits and risks in greater detail.

Matchmaking is the next chapter of the thesis, which explains the matchmaking practises, the importance of matchmaking platforms and the role of a matchmaker during the entire process.

Then, the researcher introduces the case company and its primary services as well as BMC being a tool to analyse the case company's progress with developing the IT Resources Directory.

The seventh chapter introduces the reader to the empirical research done for this study. The current developmental stage of the IT Resources Directory is investigated, and BMC is built by the researcher and the case company. In addition, the results of the interview and the survey are presented, and the suggestions for the development plan of the product are offered using the results obtained from the primary data.

In the concluding chapter, the author answers the research questions, summarises the research findings, discusses validity and reliability measures of the thesis as well as provides suggestions for further research.

2 INDUSTRY 4.0

This chapter introduces the reader to the term Industry 4.0 and the ways it affects the business world nowadays. Firstly, the thesis explains the term, its evolution, main features and characteristics. Secondly, opportunities that Industry 4.0 brings and challenges it causes are presented and described. This chapter ends with the analysis of the German market based on previous studies.

2.1 Introduction

The term Industry 4.0 was introduced by the German Federal Ministry of Education and Research, the Federal Ministry of Economic Affairs and Energy, and the Research Union of the German Federal Government. They announced Industry 4.0 as the process of integrating ICT in the manufacturing and logistics processes by using Cyber-Physical Systems (CPS). (Müller, Herzog & Eiermann 2014, 10.) 'CPS is an integration of computation with physical processes. Embedded computers and networks monitor and control the physical processes' (Lee & Seshia 2011, 2). The fourth industrial revolution allows permanent monitoring of the data flow and evaluation along the entire chain of operations due to Machine-to-Machine (M2M) communication (Müller, Herzog & Eiermann 2014, 10).

The Industry 1.0, the first industrial revolution, started at the end of the 18th century. It was the mechanization of production by using water- and steam-powered manufacturing facilities. The second industrial revolution (2.0) presented the electrically-powered mass production which was based on division of labour. The following Industry 3.0 achieved automation of manufacturing with electronics and IT. (MacDougall 2014, 7.) Industry 4.0 refers to the rapid transformation in the entire industrial production process through linking digital technology and networks with conventional industry. In other words, all participants of the manufacturing operations: the factory, suppliers, distributors, customers and the product itself are digitally connected with each other. (Davies 2015, 2.) The industrial revolution is presented on the figure below.

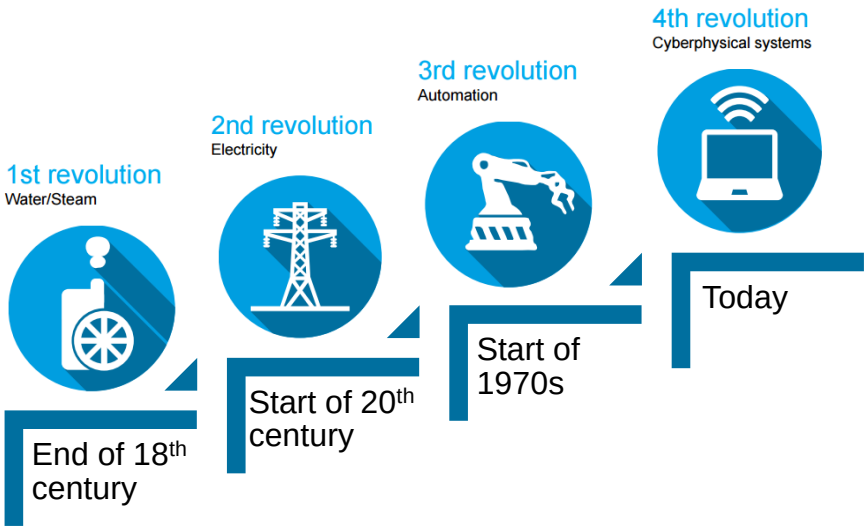

FIGURE 3. Four stages of industrial revolutions (McKinsey 2015, 14)

The revolution is driven by following disruptions: rise in information volumes, computational power and connectivity, appearance of analytics and business-intelligence capabilities, human-machine interaction development, and improvements in implementing digital instructions into the physical world, for example advanced robotics or 3D printing. (Baur & Wee 2015.)

Industry 4.0 is based on new technology developments:

- ICT that allows to digitise the data and information as well as integrate systems into all stages of the production process so that the companies can use them internally and externally.
- CPSs that make it possible to control and monitor physical processes by using ICT.
- Network communications that link machines, people and systems together via wireless and internet connections within manufacturing processes, including suppliers and distributors.
- Simulation, or in other words, virtualisation or modelling of products across the design stage of manufacturing process.
- Big quantity of data collection, data analysis, and data storage in the cloud computing.
- ICT-based support for the employees, robots and supported intelligent tools. (Davies 2015, 3.)

There are three main characteristics of Industry 4.0. The first one is horizontal integration through the value networks. It means that networking is integrated into all the process steps within the value chain. All participants of the value chain, such as internal operations, different factories, suppliers, external partners, customers and others are linked to form an end-to-end solution. The second characteristic of Industry 4.0 is end-to-end engineering across the entire value chain. The goal is full digitalization during the design, development and manufacturing phases of the new products and services, where data and information are available at all stages of the new product's lifecycle. The third characteristic is vertical integration and networked production systems. In other words, cyber-physical production systems are integrated in the different hierarchy levels of the company and production processes. For example, performance management, production control, corporate planning are linked together to receive end-to-end solution. (Gänsslen, Losbichler, Horvath & Michel 2015, 3; Schlaepfer & Koch 2015, 6-8; Brettel, Friederichsen, Keller & Rosenberg 2014, 37-41).

All of these three characteristics share the same feature: real-time performance. All participants of the value chain are able to synchronize data at any time and optimize it according to different criteria like availability, costs, or resource consumption. (Gänsslen, Losbichler, Horvath & Michel 2015, 7.)

Introduction of Industry 4.0 ends with the quoted message of the Federal ministry of education and Research regarding the fourth industrial revolution:

The future project Industry 4.0 aims to enable the German industry in a position to be ready for the future of production. Industrial production will be characterized by strong personalization of products under the conditions of high flexibilized (high-volume) production, the extensive integration of customers and business partners in business and value creation processes and the coupling of production and quality services. (Bouter 2015.)

2.2 Opportunities and Challenges

The reader is now familiar with the term Industry 4.0 and its evolution. The next step is to understand how this new digital industrial revolution changes the production process. This part of the chapter presents the opportunities and challenges Industry 4.0 brings on the market.

2.2.1 Opportunities

The automation of the production process makes the process of exchanging data much easier and faster. The flow of material, energy and information can be standardized. The integration of the networks across the entire value chain makes the participants have more understanding and flexibility when it comes to changes, problems, and interruptions in the production process. Increased flexibility leads to the mass customisation enabling to produce small quantities of goods (even a single item). The machines can be rapidly configured in order to adapt to the specific requirements of the customer. (Davies 2015, 3; Brettel, Friederichsen, Keller & Rosenberg 2014, 37-41.)

Moreover, digital designs and virtual modelling save time between the product design and its delivery. (Davies 2015, 4). The important change is that now the data from sensors can help control the quality of the product rather than determining errors using sampling. Error-collecting machinery can identify the defects faster, more accurately and in real time. (Gänsslen, Losbichler, Horvath & Michel 2015, 3.)

Advanced analytics can help avoid failures in the factories, having automated robots continue working even when employees are not present. At the same time, human workforce can be used more efficiently in other operations. All these factors can increase productivity of the manufacturing process. (Brettel, Friederichsen, Keller & Rosenberg 2014, 37-41.)

Industry 4.0 provides an opportunity for the customers to participate in designing the desired product themselves and be in control of the process

from the product development stage to the actual production process, and not depend on the manufacturer's original product's portfolio. There is also a possibility that business models face changes. The competition on the market is based on the speed of production, customer-driven designs, quality, and innovation rather than on cost. (Davies 2015, 4; Koch 2015, 10; Gänsslen, Losbichler, Horvath & Michel 2015, 7; Brettel, Friederichsen, Keller & Rosenberg 2014, 37-41).

2.2.2 Challenges

In addition to all the benefits of Industry 4.0, the companies may also face a range of challenges that can potentially affect their businesses: rapid change and high investments, data ownership, security and legal issues, employment and skills development as well as IT infrastructure. The concept of the industrial revolution is poorly defined and struggles from high expectations. The first barrier is change and investment. Complex value network within the manufacturing process brings together suppliers, distributors of the product as well as technology companies, infrastructure suppliers and internet service providers. As a result, the companies might be forced to cooperate with the competitors to identify the standards of exchange and use of big volume of data. (Davies 2015, 5.)

Moreover, there are three categories of resources that are needed in the manufacturing process: raw materials, including energy carriers, human resources, and financial resources (Kagermann, Wahlster & Helbig 2013, 62). In order to successfully implement Industry 4.0 in the business operations the companies have to invest a lot in ICTs and equipment as well as in qualified labour force. It is quite problematic to achieve, especially for SMEs due to limited budget and insecurity. (Davies 2015, 5.)

Another issue is data ownership and security. Due to the great volume of data collected and shared with partners within the value network, the companies have to protect their confidential information from unauthorised access and misuse. (Kagermann, Wahlster & Helbig 2013, 6.) In addition, it should be clear who owns which industrial data, as there may be certain

legal issues regarding product liability, employee supervision and intellectual property. For instance, if a customer requests an individualised product from the supplier, it is difficult to decide who owns the intellectual property. Another example of the potential legal issue is the case when autonomous manufacturing system identifies a defective or dangerous error. It is then quite problematic to determine who in the value network is in fact responsible for that. (Davies 2015, 6.)

Employment and skills development can be yet another challenge. The new industrial revolution requires to combine together different fields of knowledge such as production, mechanical and process engineering, automation engineering, IT and the Internet. Processes and businesses within the digital value chain require new skills and qualifications. (Geissbauer, Schrauf, Koch & Kuge 2014, 35.) Programming and monitoring high performance machines are the key tasks in the value network. Employees with average skill level might be replaced unless they are retrained. Companies need creative technical and ICT experts with solid decision-making skills. (Davies 2015, 7.)

As there is a large number of users involved in the value network, it is necessary to create IT infrastructure with common standards in order to enable efficient high-volume and usually time-critical data exchange, and avoid traffic and loss of data. (Kagermann, Wahlster & Helbig 2013, 46).

Other challenges include low maturity level of necessary technologies, lack of prioritisation and insufficient network stability. (Geissbauer, Schrauf, Koch & Kuge 2014, 36.)

To conclude, Industry 4.0 opens a lot of opportunities for the companies. At the same time, it creates certain challenges. Below, the table of opportunities and challenges of Industry 4.0 is presented to summarise the findings.

TABLE 2. Opportunities and challenges of Industry 4.0

Industry 4.0	
Opportunities	Challenges
Flexibility	Change and investment
Mass production	Data ownership
Speed	Security
Product quality	Legal issues
Productivity	Employment and skills development
Customer's rights	IT infrastructure
Business models	

The benefits are flexibility in many aspects of the production process, mass customisation, speed and efficiency of production, influential role of customers, and new business models. In order to achieve these benefits, the companies and different supportive organizations should overcome rapid change and big amount of investments, identification of data ownership, security issues and legal issues regarding product liability, employee supervision, and intellectual property, lack of qualified employees as well as building an IT infrastructure.

2.3 German Market

After introducing the opportunities and challenges Industry 4.0 introduces, the study analyses how particularly German companies deal with them. For that reason, the key findings of prior studies about German firms, conducted by McKinsey and PwC companies, are presented.

2.3.1 Overview

Germany has an ideal position to achieve leadership in the new industrial revolution. The country is strong at machinery, manufacturing industry,

automation, research, development and production of manufacturing technologies as well as management of industrial processes. In addition, it has a great level of IT competences and know-how in embedded systems. All in all, Germany has almost all conditions to successfully tackle Industry 4.0 implementation. (Kagermann, Wahlster & Helbig 2013, 5.) However, there are other countries that compete against Germany for the leading position in the manufacturing engineering sector. The main competitors are Asia, particularly Japan, and the United States of America (USA). McKinsey conducted a research to analyse Germany's position compared to its main competitors.

2.3.2 McKinsey Survey

McKinsey is a global management consulting company. It serves government and non-government organizations as well as leading businesses. The firm helps its clients to improve their performance on a long-term basis and to help them realize the most desired goals. (McKinsey & Company 2016.)

McKinsey conducted a survey of companies operating within the above mentioned countries, which are actively participating in Industry 4.0 implementation. The aim of the survey was to understand whether the companies viewed Industry 4.0 as an opportunity or a risk, and analyse prior investment decisions. The survey was held among 100 companies per country which had at least 50 employees, and specialized in the following fields: industrial automation, healthcare, paper and packaging, software, transport and logistics, industrial equipment, and semiconductors. Both technology suppliers and manufacturers participated in the survey. (McKinsey 2015, 16.)

This thesis presents the key findings of the McKinsey survey regarding German market and its competitors as well as the fields which are affected by Industry 4.0.

The figure below shows that, when compared to Japan, the U.S. and Germany have more confidence as to the benefits Industry 4.0 can bring to the manufacturing process.

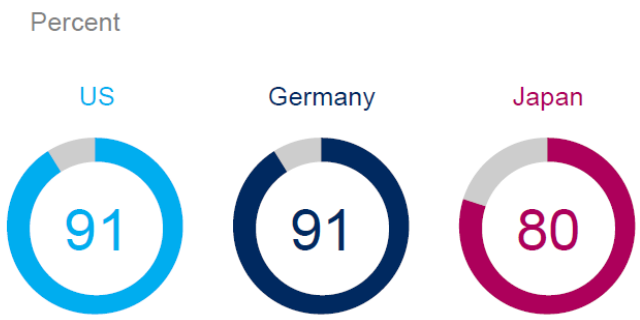

FIGURE 4. Industry 4.0 – opportunity or risk (McKinsey 2015, 50)

Nevertheless, all the countries' rates are high, which means that Germany, the U.S. and Japan admit the benefits of Industry 4.0 development and are eager to turn them into reality.

Now it is clear that the companies accept and see Industry 4.0 as an opportunity. Looking at the second finding of the McKinsey survey, which is presented on the Figure 5, the reader can see how ready companies are to invest in this opportunity.

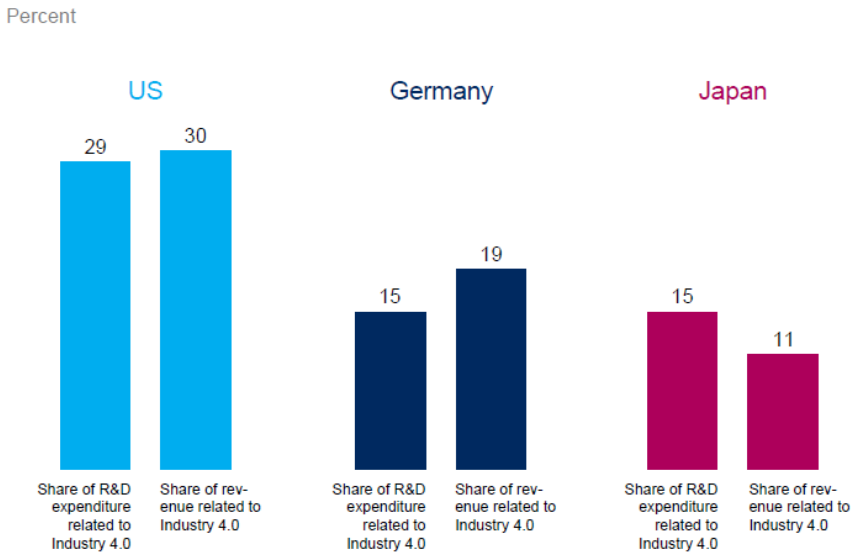

FIGURE 5. Willingness to invest in Industry 4.0 (McKinsey 2015, 48)

Figure 5 illustrates that Germany is quite careful with the investments compared to the U.S. Even though the Industry 4.0-related revenue is already making up 19 percent, there is still only 15 percent of total investments in the Industry 4.0-related Research and Development (R&D). On the contrary, the U.S. is more prepared to make a commitment towards Industry 4.0 realization. (McKinsey 2015, 48.) This can be explained by the cultural differences. Germans are eager to plan and develop concepts thoroughly with many details and careful calculations. It is important to be logical and systematic in the German culture. They consider all the obstacles, mistakes, and make predictions in advance in order to minimize all potential risks and eventualities. Germans tend to not take any risks. (Kavalchuk 2012, 31.) American culture is quite different when it comes to risky decisions. The willingness to take risks is a basic aspect of the culture. Going back in history, starting from 1700 and 1800s immigrants to the U.S. were ready to risk their lives to go all the way around the globe to the “New World”. (Weaver 2001, 4.)

The next important aspect is to identify the areas which have the greatest impact on the business model with Industry 4.0 implementation. The figure below shows the main fields: software, process industry, heavy/industrial machinery, discrete manufacturing, and logistics. The percentage rates indicate the amount of impact Industry 4.0 had on each of these major fields from the surveyed companies’ perspectives.

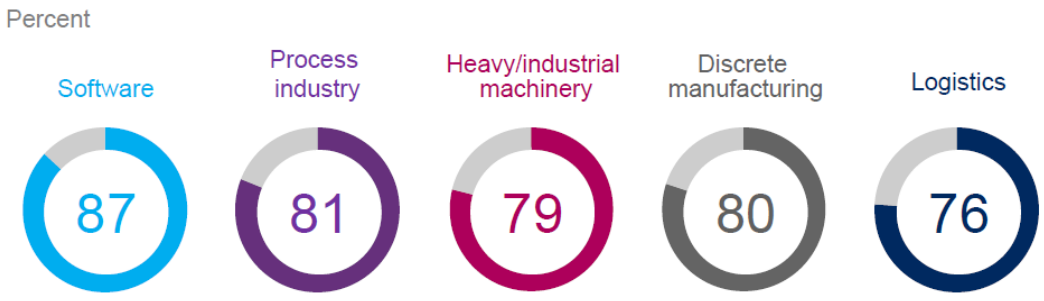

FIGURE 6. Impact of Industry 4.0 on different business sectors (McKinsey 2015, 51)

It is clear that software industry is impacted by Industry 4.0 the most. The high demand for a big number of new ICT solutions can explain this trait.

The fourth important finding of the McKinsey survey is that labor, development time and quality are the main areas which need improvement from the companies' perspectives. They plan to optimize them with digitalization of intellectual work and advanced analytics.

Another finding relates to the obstacles German market faces with the implementation of Industry 4.0. According to the McKinsey survey, there are four main obstacles in the way of German companies: process and monitor know-how for employees, data security and safe systems, end-to-end connectivity using wireless networks, and standard for data transfer. (McKinsey 2015, 17.)

Another trend to pay attention to is the relocation of labour-intensive work to other countries, which have lower labour costs. In other words, the outsourcing of industry activities to other countries where companies can pay smaller salaries, or to those companies within the country, who have the necessary expertise. (Davies 2015, 2.) Outsourcing is usually practised by the companies to reduce costs, focus on core competencies, and increase flexibility. However, companies can also be quite suspicious about this kind of business practice due to security, cultural issues, loss of control, lack of copyright laws, and the certain regulations of the country where a company outsources its services to. (Weinert 2007, 41-45.)

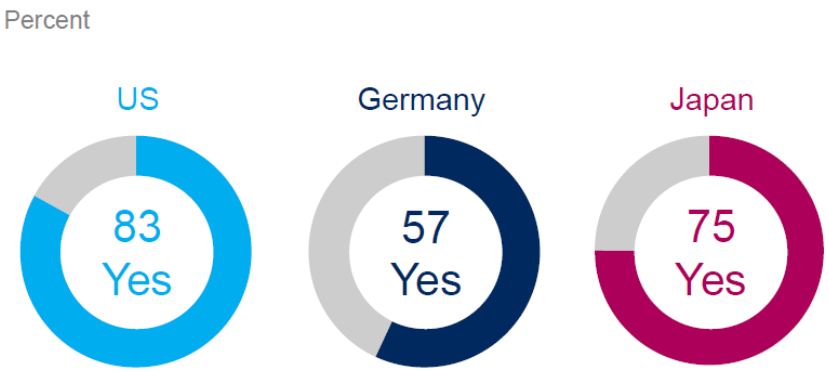

FIGURE 7. Willingness to outsource IT operations (McKinsey 2015, 46)

According to the McKinsey survey, German companies have become somewhat reluctant to work with foreign IT providers due to cybersecurity issues compared to its competitors.

2.3.3 PwC Study

PwC company, operating in more than 150 countries, has become one of the leading services networks in the world. It helps the individuals and different organizations to create value by delivering tax and consulting services as well as quality in assurance. (PwC 2016.)

PwC group has conducted another study based on a survey of 235 German industrial companies. Figure 8 shows one of the key findings which addresses the barriers German companies may face when implementing Industry 4.0.

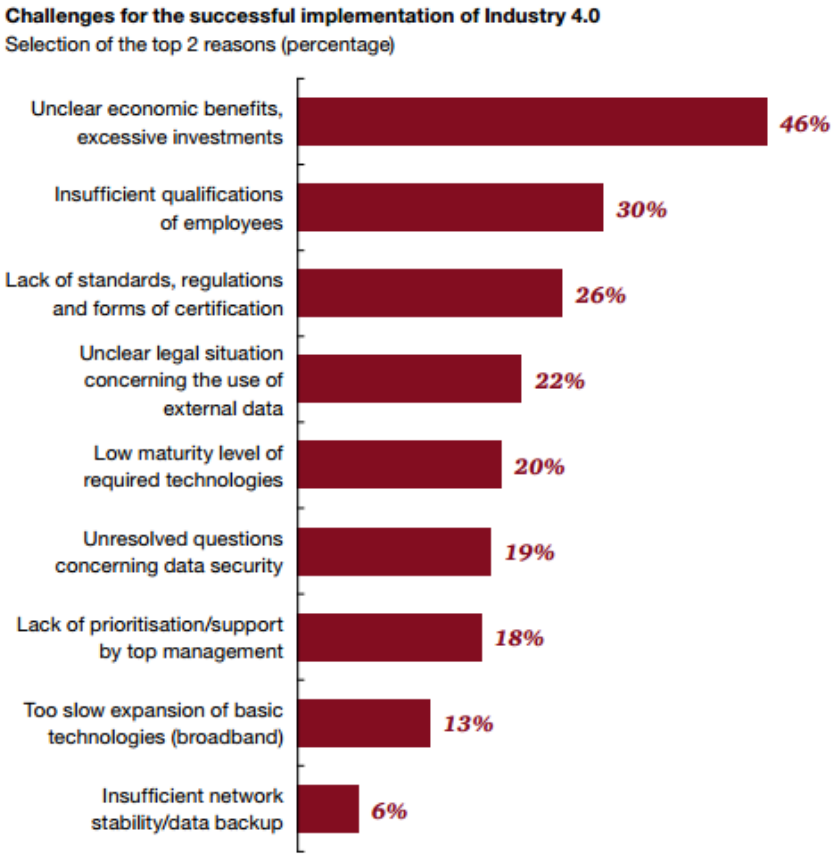

FIGURE 8. Challenges caused by Industry 4.0 for German enterprises (PwC 2016, 36)

Based on the figure provided the three main challenges are unclear economic benefits and investments, lack of qualified employees, and legal issues regarding external data. German companies are sure that there is a need for industrial associations, trade unions, employer's associations, and policy makers in order to resolve these issues. Among other possible solutions are promotions of young entrepreneurs, international standardisation or data protection laws. (Geissbauer, Schrauf, Koch & Kuge 2014, 37.)

When it comes to finding qualified employees within the German market, there seems to be a concerning demographic trait going on. The percentage rate of young people in Germany decreases each year, and the number of older people increases mainly because of a declining birth rate in the country. The Figure 9 shows the demographic change within the German population covering the period from the end of 19th century to the year 2060. (KUKA Aktiengesellschaft 2016, 13.)

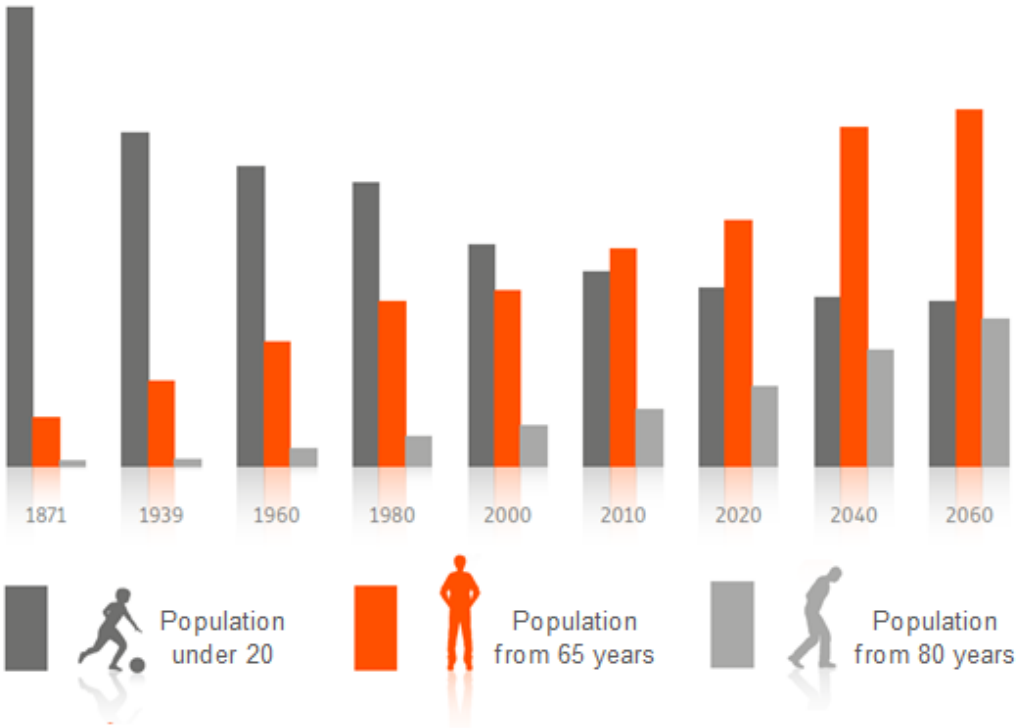

FIGURE 9. Demographic change of German population (KUKA Aktiengesellschaft 2016, 13)

The decline in the number of young German people might be a threat for the German economy as it creates the lack of young qualified workers. According to the calculations, done by the German Federal Statistical Office, by the year 2030, 20,000 out of 100,000 currently employed people working in the manufacturing industry will already be retired. (KUKA Aktiengesellschaft 2016, 13.)

2.3.4 Key Outcome

To sum up, even though Germany has many advantages to win the race for the leadership in the manufacturing engineering sector, the competition becomes fiercer because of the strong positions of Japan and the U.S. According to the McKinsey survey, all of these countries recognised the digital trend and view it as an opportunity for their countries' economies. They are ready to make the commitment and invest in the development. However, both Germany and Japan, seem to be more careful with their investments compared to U.S., which can be explained by cultural differences, particularly the attitudes towards taking risks. In addition, software industry is the area most affected by Industry 4.0, as the trend is based on ICT, CPS and networks. The main barriers for German companies are unclear economic benefits and standards, high investments, monitor know-how of employees, data security and safe systems, as well as lack of suitably qualified employees. The last issue may become even more serious in the future due to the demographic decline of the young population in Germany. One of the options companies have to reduce costs and find qualified labour is outsourcing. However, even though more than half of the companies on the market are willing to practice this model, some are quite suspicious due to potential cybersecurity issues. In order to get a better understanding of what outsourcing means, as well as companies' attitudes towards this option to meet Industry 4.0, the author leads the reader to the next chapter of the thesis: outsourcing.

3 OUTSOURCING

This chapter presents the term outsourcing, which is important for this thesis. It is one of the options German companies can use to solve problems arising from the new step in digitalization. Firstly, this chapter introduces the concept of outsourcing. Secondly, different types of outsourcing practices are explained. Then, advantages and disadvantages of outsourcing are analysed.

3.1 Definition

The word ‘outsourcing’ has combined three different words: ‘outside’, ‘resource’, and ‘using’ (Weinert 2007, 21). Outsourcing refers to the act of procurement of materials and services from the external source, that can make it cheaper, faster, or better (Tayauova 2012, 189; Troaca & Bodislav 2012, 53). The history of outsourcing is deeply connected with the history of modern business enterprise in the latter half of the 19th century. There is a theory that, due to the series of technology improvements at that time, the countries had abundance of different kinds of products and goods. Among the major technology innovations were railroad and telegraph. Improvements in transportation and communication encouraged companies to serve larger regions. Thus, they started to seek foreign help wherever possible. (Gonzales, Dorwin, Gupta & Kalyan 2016, 1.) That is how outsourcing has become an important part of business operations in the era of globalisation (Chongvilaivan & Thangavelu 2013, 2).

3.2 Types of Outsourcing

Outsourcing can be divided into: IT outsourcing, Business Process Outsourcing (BPO), and Knowledge Process Outsourcing (KPO). IT outsourcing is the case when IT service provider takes over the operation and maintenance of a company’s IT infrastructure, such as hardware, software, database and network operations. It is the most mature outsourcing type compared to two others. In the end of 20th century IT outsourcing was practised almost in all companies all over the world.

Companies recognized that with the help of external IT expert they can develop more complex systems, and make the management of the business processes more efficient. No matter how traditional the business model of the organization was, it outsourced at least one or more IT functions to the outside vendor. (Mierau 2007, 3; Deloitte 2013, 4.) Another type, BPO, includes outsourcing practices in such fields as Finance, Human Resources, Procurement, Customer Service and some office functions (Deloitte 2013, 4.) It is the case when a certain business process, completely or partially, is assigned to the third party. Payroll accounting is one of the examples of the BPO. (Braun & Winter 2016, 2.) Payroll refers to the process of identifying all employees of the company, calculating the sum total a company must pay to them as well as taxes, record all the data, make payments and submit all required tax forms and reports (Mostyn 2008, 1). Lastly, KPO is the case when a company needs a partner with higher level of expertise, analytic and technical skills for the business operation. The difference between BPO and KPO is that the first one provides extensive process expertise, while the latter is based on business expertise. (Mierau 2007, 3.)

In addition, outsourcing can be divided into three groups by localization: offshoring, nearshoring, and onshoring.

- Offshoring is the outsourcing practice with the third party, which is located outside the country.
- Nearshoring is the outsourcing practice with the third party which is located in a nearby country, often sharing a border. (i.e USA to Canada)
- Onshoring is the outsourcing practise with the third party which is located inside the same country. (Conboy 2014, 9.)

Moreover, outsourcing can have different nature: conventional and greenfield. In the case of the first one, human resources, facilities, equipment or technology are transferred to the third party. In a greenfield, a company purchases the necessary resource from the third party. In order to decide which practice is more suitable for the company, it has to

determine whether it is more beneficial to complete the task in-house using resources from the third party, or buy needed resources from the outside vendor. (Chamberland 2003, 73-75.)

There are two main views when it comes to the outsourcing decision: tactical or strategic. The first one is outsourcing driven by a short-term problem solving. Strategic outsourcing, on the other hand, is structured so that the company can accomplish long-term goals. (Soriano-Meier, Garza-Reyes, Lal & Rocha-Lona 2012, 760.)

3.3 Advantages and Disadvantages

Traditionally, the main advantage of outsourcing is cost reduction. Other influential aspects are emphasis on core competencies, access to external expertise, flexibility, speed of the development, and risk reduction.

By handling over non core activities to a third party, a company can allocate their saved resources on those activities that are important for the value proposition and competitiveness positioning. When a company faces a lack of a certain resource, human or equipment, outsourcing might be an option to solve the problem. Instead of retraining the internal staff, hiring someone new or purchasing new equipment, it is beneficial for the organization to outsource a certain task to the company that has the necessary expertise and assets to tackle it. Flexibility is another aspect that encourages companies to practice outsourcing. Externalisation of the business activities makes the organizational structure leaner as the internal employees can focus on the key operations. Thus, hierarchical structure of the company becomes not so strict, and, thereby, the information flow gets faster both bottom up and top down. The decision making process in such organization becomes more efficient. Another benefit refers to the fact that it is cheaper and easier for a startup, for example, to outsource some functions rather than develop them from scratch. Last but not least, is the risk reduction by transferring certain high-risk processes to the third party that has more experience handling the operation. (Deloitte 2013, 12; Weinert 2007, 35; Tayauova 2012, 190.)

Despite the range of advantages, some companies get more and more suspicious and uncertain about using external parties in their business operations due to a number of challenges (McKinsey 2015, 47).

The main disadvantage of outsourcing is the loss of control over the outsourced activities. By giving some of the operations to a third party, a company cannot fully monitor the performance of those operations. In order to manage external resources, a company has to have a strong combination of negotiation power, process management, and contract management. (Tayauova 2012, 190.) Therefore, a company is highly dependent on the performance of the third party. If something within the external operation goes wrong, it is hard for the company to fix it. (Garrett 2011, 2.)

Another issue is security and confidentiality. With giving some operations to the third party, a company gives information that might be valuable and sensitive. There is higher risk that this information can be used improperly and get stolen. Therefore, keeping all the business processes in-house increase security of data. (Tayauova 2012, 190; Garrett 2011, 2; Weinert 2007, 37.)

It leads a reader to the next challenge being lack of copyright laws. It is a serious issue especially for the companies specializing in innovations based on R&D. The companies have to carefully analyse information they allow a third party access to as well as take into consideration the issues related to patent protection and local legislation. (Weinert 2007, 38.)

Quality issues are an essential barrier while choosing outsourcing. One of the drivers for a company to outsource is an expectation to receive a better service from the third party rather than from in-house. Choosing a wrong partner, who delivers a service, which does not meet the client's quality standards, can lead to the damaged reputation and loss of the established market position. (Tayauova 2012, 190; Garrett 2011, 2.)

Another serious barrier is hidden costs. As mentioned earlier, cost reduction is the main driver for the company to outsource. However, as the

contract between a client and the outsourcing company only has financial coverage for specific actions, any other necessary services needed to complete the task will require the company to pay additional fees.

Among other challenges are difficulties to bring once outsourced know-how back in-house as well as to identify which processes are core and noncore, as most of them are dependent on each other, lack of knowledge about a third party, and cultural differences. (Tayauova 2012, 190; Garrett 2011, 3; Weinert 2007, 39; Iqbal & Dad 2013, 94.) The last one can become a great challenge for a company that works with a foreign provider. There are a lot of books, training materials and conferences regarding cross-cultural competencies in business. However, problematic scenarios still exist in offshore outsourcing practises. The most common barrier is language, even though language skills can be leant and improved. Such aspects of social and cultural values of the company's organizational structure as religion, social and political systems, negotiation tactics, and managing business are significant in the international cooperation. (Iqbal & Dad 2013, 94.) To sum up, the table listing advantages and disadvantages of outsourcing is presented below.

TABLE 3. Advantages and disadvantages of outsourcing

Outsourcing	
Advantages	Disadvantages
Cost reduction	Loss of control
Focus on core competencies	Security and confidentiality
Access to external expertise	Lack of copyright laws
Flexibility	Quality issues
Speed of development	Hidden costs
Risk reduction	Difficulties to reverse
	Difficulties to identify core competencies
	Cultural differences

According to the table, there are more disadvantages rather than advantages when it comes to outsourcing. However, “numerical superiority does not ensure victory” (Crofoot, Gilby, Wikelski & Kays 2008).

4 MATCHMAKING

The author states that the case company local global GmbH is a matchmaker, because it wants to create a platform so that two parties could meet each other. This chapter explains the concept and different models of matchmaking as well asthe role of a matchmaker throughout the process.

4.1 Background

Globalization opens new opportunities for the companies. It helps them enter new markets, reach new customers or operate in their own country more successfully due to international qualified employees, for example. However, the companies might face certain challenges such as lack of financial resources or specialists in the company, as well as demand for specific equipment. One of the solutions is to cooperate with partners in order to benefit each other. (Stolz 2006, 53; Raman 2001, 4.) The number of companies in the different fields is constantly and rapidly growing all over the world (EconStats 2016). It is a time-consuming problem for the company to identify the right partner. Therefore, matchmaking platforms have been established in order to build up networks and assist companies in finding partners. (Stolz 2006, 53.)

As a term, matchmaking is not widely used in the academic literature. In most cases it relates to the online and offline dating practices. However, lately the term has become more commonly used when referring to the process of connecting two or more business parties together for the mutual benefit. (Duwairi & Rawashdeh 2016, 1.) The parties in need of know-how, expertise, facilities, or goods are brought together to share knowledge and build foundations for mutually beneficial relationships (Norros 2011, 53).

4.2 Models of Matchmaking

There are several ways to conduct the matchmaking. Each approach is chosen according to the target group of an organizer. The approaches are different based on the nature of the business, its location, and organizational structure. (Oxford Research 2012.) The first one, is an electronic market portal, which has become quite popular among international enterprises in the recent years. It represents the electronic matchmaking tool that has an online database of suppliers, manufacturers and any other potential partners. The list of the participants is always available to view. A visitor of the electronic market portal can find a potential partner by either manually entering certain specifications or filling out the form provided. Based on the search results the demander then has an option to schedule meetings with the identified companies. (Stolz 2006, 53; Oxford Research 2012.)

The second matchmaking model refers to the events at trade fairs and exhibitions. Most of the matchmaking events take place during trade shows. (Oxford Research 2012.) The more exhibitors and visitors attend the event, the higher probability is that companies establish valuable contacts and schedule business meetings. To maximize the participation, an organizer might provide obligatory matchmaking services for the clients. At such trade shows, each company that decides to exhibit, should take part in this programme. However, only a few visitors are selected to attend. They are chosen by the organizer. (Stolz 2006, 54-55; Norros 2011, 14.)

Next matchmaking model is hosted buyer programmes. This model applies to buyers, being the company's most influential people with decision-making powers, who are invited to participate in these programmes. During these hosted buyer programmes, they participate in face-to-face meetings with the exhibitors who meet buyers' requirements. In order to attract buyers to participate in this matchmaking model, the organizer has to thoroughly screen the candidates and find out details

about the amount of business made internationally, annual budgets, and prior business experience. (Stolz 2006, 55.)

Another model is stand-alone matchmaking and brokerage events. Usually these matchmaking meetings are held in the convention hotels or conference rooms for a limited number of participants. An organizer has to create a catalogue, listing the profiles of the participating companies. (Stolz 2006, 56.) The advantage of this model compared to the matchmaking model at the exhibitions is that companies can save time and money as no long-term preparation is needed. (Duwairi & Rawashdeh 2016, 2.)

The fifth model is business delegations. The idea is that a limited group of enterprises travels abroad to attend various exhibitions and matchmaking events. This model lets selected companies visit international matchmaking events, establish business partnerships or joint ventures. The organizer has to update the travelling delegation as to the political and economic background as well as leading industrial sectors of the country of destination. (Stolz 2006, 56; Norros 2011, 12.)

Last but not least popular model of matchmaking, is sector-specific and multi-sector events. Matchmaking meetings can be organized either for a single sector or multiple sectors. The goal of a sector-specific matchmaking event is to bring together companies from one single field. In this way, matchmaking rate has to be high because participated companies are all from the same value chain. (Stolz 2006, 57; Brynning & Jorgensen 2012, 11.) Multi-sector events are held to bring together companies from various sectors that are interested in establishing partnerships with each other. The number of participants may vary from 250 to 2000 companies. (Stolz 2006, 56; Oxford Research 2012.)

4.3 The Role of Matchmaker

Successful matchmaking requires the organizer, who can also be called a matchmaker, to be efficient and active. The organizer's role is important as

he is responsible for analyzing specific needs of both sides in order to reach the mutually beneficial arrangement between the two. (Stolz 2006, 54.) Matchmaker chooses the appropriate venues for the parties to meet at, and finds the right contacts, who can potentially be interested in establishing long-term partnerships. This role requires a variety of skills. The matchmaker has to have substantial knowledge about a business sector he operates in, as it is crucial for identifying the right contacts, building trust and making correct decisions fast. He also has to constantly extend the list of existing players in the field of his expertise. This allows the matchmaker to find the right partners for the match, be updated about the situation on the market and show the customers his valuability. In order for a matchmaking process to be successful, the organizer should understand both parties he is dealing with. He should be able to understand their projects and ideas as well as their needs and requirements. The role of a matchmaker is challenging because he should have certain personal characteristic in addition to the necessary expertise. Among the very important personal traits are being active, friendly as well as at times punchy with a good flair, and excellent communication and organizational skills. (Brynning & Jorgensen 2012, 20-71; Oxford Research 2012.)

5 CASE COMPANY

This chapter of the thesis introduces the case company local global GmbH to the reader. The author explains what services the company provides and in what fields of business it operates in.

5.1 Introduction

Established in 2000, local global GmbH aims to encourage global communication providing publishing, conference and media services. The company, located in the center of Stuttgart, is eager to help German companies operate more efficiently on the market and assist international companies willing to enter the German market. local global GmbH is a media partner for many fairs, exhibitions and conferences. Among the existing customers are private companies, trade and IPAs, associations, and the exhibition industry. In addition, the company also presents its own international projects related to the educational sector during various trade shows.

5.2 Services

International team of local global GmbH provides three areas of services: corporate publishing, events and exhibitions, and marketing and media.

Corporate Publishing

local global GmbH provides publishing services, as well as its expertise in regards to concepts, formatting ideas, design suggestions as well as marketing and sales activities. Moreover, local global GmbH encourages companies to participate in their existing publications. Among them are official German trade fair magazines that include conferences schedules, innovative trends on the market, and profiles of the participants of the fairs. Moreover, one of the types of existing publications are books analyzing markets and business environments in the specific region such as Danube Region or Latin America. These kinds of books help companies

successfully operate in the mentioned regions and find the right partners there.

Events and Exhibitions

local global GmbH is invited to attend the most important fairs in Germany: Hannover Messe, CeBIT, Metropolitan Solutions, Global Connect, didacta and IT & Business. Being a dedicated participant, the company introduces its own media solutions and organizes the conferences for its partners. local global GmbH attracts individual exhibitors and trade promotion agencies, which want to organize their own events or be promoted. The company can provide assistance with the general concept, communication and organization aspects of the event including planning, booking, coordinating of service providers, and staffing.

Marketing and Media

local global GmbH strives to help international companies enter the German market. Therefore, the main marketing services include providing visibility to international entities at trade shows, locating valuable contacts to assist them in establishing long-lasting partnerships with German firms, and preparing promotion materials such as brochures, flyers, and websites.

6 BUSINESS MODEL CANVAS

In order to build the development plan for the case company, Business Model Canvas is used as a tool to analyse all key components and functions involved in the IT Resources Directory development. Thus, in this part of the research, theoretical foundation of BMC is described.

6.1 Definition

A business model is an analysing tool as to how the company creates and delivers value to customers, and how the sale of this value makes the company profitable (Teece 2010, 173; Slavik & Bednar 2014, 19). Companies started to actively use the concept of business models during the Digital Economy period of the 1990s, when they were frantically searching for new ways of operating businesses. There have been a number of debates and discussions as to ways to find the 'correct' concept of a business model, but the concept has not yet been defined. The empirical use of a business model is critical due to the fact that it is not theoretically grounded. (Mäkelä & Pirhonen 2016, 2-3.) Nevertheless, business model is a powerful visualization of a business structure, demonstrating all the components and interconnections involved in value proposition, infrastructure management, customer interface and financial viability. (Teece 2010, 173; Coes 2014, 10-11; Osterwalder & Pigneur 2009, 15.)

Business Model Canvas (BMC) was developed by Alexander Osterwalder based on his work on business modeling (Coes 2014, 8). According to his definition "Canvas is a business model that describes the rationale of how an organization creates, delivers, and captures value" (Osterwalder & Pigneur 2009, 14). Canvas divides four major areas of analysis: value proposition, infrastructure management, customer interface and financial viability into nine standardized dimensions: customer segments, value propositions, channels, customer relationships, key partners, key activities, key resources, cost structure and revenue streams (Coes 2014, 12; Osterwalder & Pigneur 2009, 16-17).

6.2 Dimensions of BMC

BMC contains nine dimensions to analyse a company or a product, which are depicted in Figure 10 , all the measures are presented and explained.

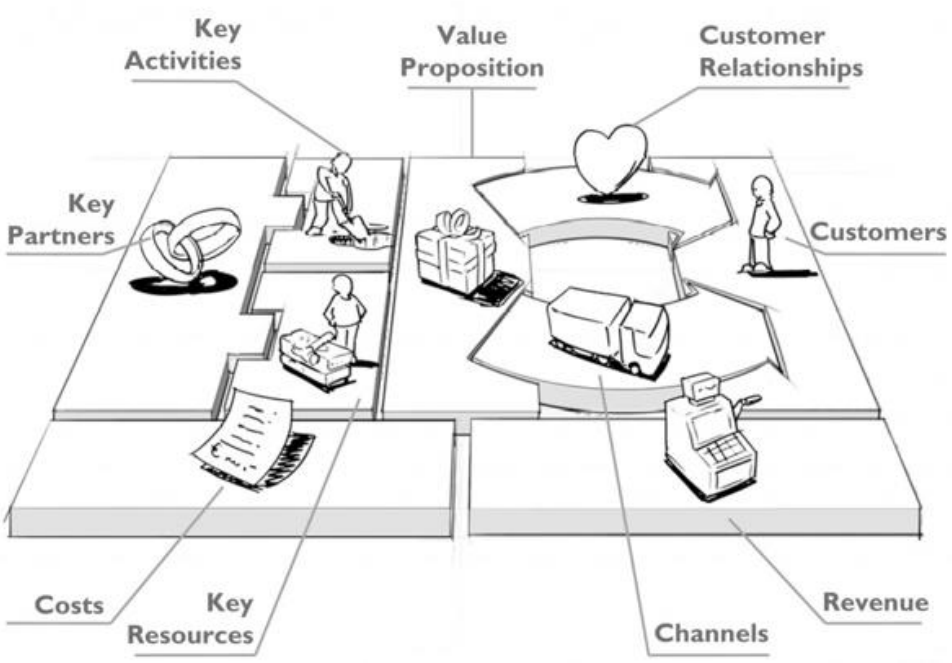

FIGURE 10. Business Model Canvas (Osterwalder & Pigneur 2009, 18)

Customer Segments

Customer segment captures different groups of people or organizations, which a company aims to reach, serve and offer a value to (Osterwalder & Pigneur 2009, 20; Mäkelä & Lehtonen 2016, 5). Profitable customers are the key component for company's long-term market position. In order to serve them better, a company may conduct customer segmentation. (Osterwalder & Pigneur 2009, 20.) It is a process of classifying a market into customer segments or groups according to common needs, wants, behaviours and other characteristics (Lynn 2011, 4). A company has to carefully determine which customer segments need to be prioritized, so that a business model is designed to reflect specific needs of a targeted group. (Osterwalder & Pigneur 2009, 20.)

Value Proposition

Value proposition is the center of BMC as it is a crucial reason for a customer to choose one company over another. Value proposition is an identification of the main features of a company's product or service that brings the value to a specific customer segment. (Osterwalder & Pigneur 2009, 22.) Value proposition is carefully designed to solve a customer's specific problem and satisfy his specific needs (Coes 2014, 20).

Channels

Channels are the company's means of reaching out and communicating with customer segments to deliver a value proposition (Osterwalder & Pigneur 2009, 26). With the help of the channels, a company can raise the awareness of a product or service on the market, help customers evaluate a value proposition, let customers purchase a product or service, deliver a value proposition and provide post-purchase support to the customers. Communication, distribution and sales channels are interaction points of a company with a customer, and they can greatly affect the customer's entire experience. (Osterwalder & Pigneur 2009, 26; Coes 2014, 21.)

Customer relationships

Customer relationships refer to relationships a company wants to establish and maintain with the specific customer segment (Mäkälä & Lehtonen 2016, 5). There are six types of relationships between a company and a customer: personal assistance, which is based on human interaction during the entire sales process; dedicated personal assistance, meaning that an individual client has his own representative in a company; self-service where there are no direct relationships between a company and a customer; automated services that automatically provide requested information to a customer based on his characteristics; communities where users can exchange knowledge and give advice; and co-creation platform where customers can evaluate the value proposition by writing reviews (Osterwalder & Pigneur 2009, 29; Slavik & Bednar 2014, 24.) The goal of

all these types of relationships is to build strong customer loyalty, attract new clients, and, thus, sell more products or services (Coes 2014, 21).

Revenue Stream

The dimension of BMC Revenue Stream refers to "...the cash a company generates from each customer segment" (Osterwalder & Pigneur 2009, 30). In other words, the ways a company makes money (Mäkelä & Lehtonen 2016, 5). It is very important that a company correctly calculates the value of their services, so that customers are able and willing to pay the necessary price. (Osterwalder & Pigneur. 2009, 30).

Key resources

The dimension Key Resources describes particular assets required to make a business model work (Osterwalder & Pigneur 2009, 34). Based on the type of a business model in place, various companies need different resources to design, communicate and deliver value (Coes 2014, 22). Resources can be physical, which include vehicles, production facilities or equipment; intellectual, which involve knowledge and expertise; human, being labour force and skilled employees; and financial or monetary resources (Osterwalder & Pigneur 2009, 35; Slavik & Bednar 2014, 24; Coes 2014, 22). The goal is to determine the key resources required to create a value proposition, establish channels and customer relationships as well as generate revenue (Osterwalder & Pigneur. 2009, 35).

Key activities

Key activities refer to the actions needed to be done to make a business model work (Osterwalder & Pigneur 2009, 36). This dimension describes the key activities involved in the value creation (Slavik & Bednar 2014). All activities can be divided into three groups: production, problem solving and network or platform activities (Coes 2014, 24; Osterwalder & Pigneur 2009, 37). The first group deals with designing, producing, and physically delivering a product. Production activities are crucial for the manufacturing companies. The second type of activities refers to the consulting practices.

Problem solving activities include dealing with challenges, creating new solutions, and improving the operations. The third group refers to business models where networking, software or matchmaking platforms are involved. (Osterwalder & Pigneur 2009, 37.)

Key Partnerships

This dimension covers partners, organizations, and suppliers that are needed to make a business model work (Osterwalder & Pigneur 2009, 38). Companies engage in partnerships to acquire resources and activities, reduce risks and uncertainty, or to optimize the business model (Slavik & Bednar 2014, 24). It is important, thus, to clearly identify who the key partners and suppliers are, what resources they provide and what activities they perform (Osterwalder & Pigneur. 2009, 39).

Cost Structure

Cost Structure dimension refers to the monetary flows spent to produce and deliver the value proposition, maintain customer relationships and generate revenue (Slavik & Bednar 2014, 24; Coes 2014, 22-23). After defining all the activities, resources and partners, the costs can certainly be calculated (Osterwalder & Pigneur 2009, 40). The obvious goal of each business is to create more revenue and reduce costs (Garrett & Kalyan 2005, 143). It is worth mentioning that for some businesses low cost structure is more important than for other businesses. It depends on whether the chosen business model is cost-driven or value driven. The cost-driven model focuses on minimizing costs wherever possible, while the value driven model emphasizes the importance of creating value rather than focusing on costs. (Osterwalder & Pigneur 2009, 41.)

7 EMPIRICAL RESEARCH AND DATA ANALYSIS

There are five theoretical chapters in this thesis which explain the main terminology and concepts of the study. Below is the figure showing the main outcome of the theoretical part of this thesis.

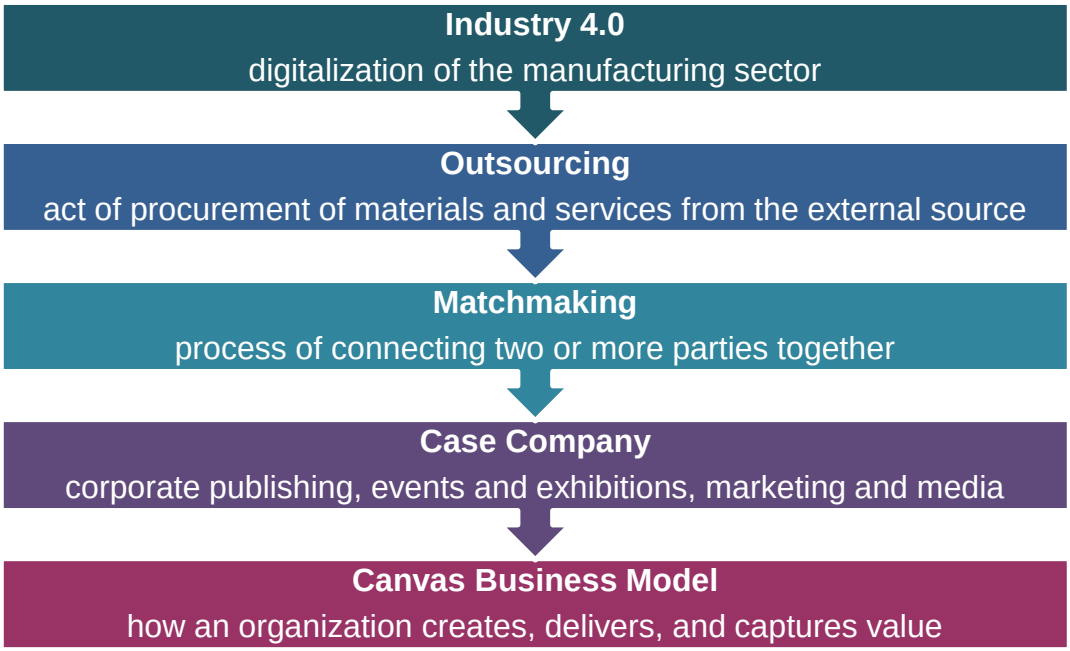

FIGURE 11. Outcome of theoretical part

The reader is now familiar with the new industrial revolution, which received a name Industry 4.0. One of the possible solutions to stay competitive on the market during digitalization age is outsourcing, which means handing over certain business operations to a third party. In order to help German companies find potential partners, the case company local global GmbH, as a matchmaker, wants to provide matchmaking platform the IT Resources Directory to help the parties connect. The reader is also familiar with the case company and its main services provided: corporate publishing, events and exhibitions, and marketing and media. Business Model Canvas is used in this empirical part of this research to identify how local global GmbH plans to create, deliver and capture value. Thus, the theory on BMC is also presented in the theoretical part.

The following chapter is a description of the empirical part done for the research. First, the chapter presents the research methods as well as the

structure and design of the surveys and interviews conducted. Secondly, the data collection process is explained. Then, the conclusions of the empirical part of the research are presented and analysed.

The foundation of the empirical research consists of an interview and a survey. The interview of a German consulting company is used to get a better understanding of the current situation around outsourcing in Germany. The outcome of the interview is used as a source of information and is not analysed. The survey was conducted among German enterprises working in the following fields: machinery, automation and IT. The survey discusses attitudes of German companies towards outsourcing practices and cooperations with foreign partners. The results of the survey are presented and analysed.

7.1 Design and Formulation of the Empirical Research

Empirical research is conducted to present the results of quantitatively or qualitatively gathered primary data on a real phenomenon. Empiricism gives the research the most value. (Kothari 2004, 31.)

In the first chapter, qualitative and quantitative research methods are introduced and the differences between the two are explained. Quantitative research method is used to test the issued topic and to obtain the statistical result. Qualitative method, on the other hand, is used to gain a deep understanding of the phenomena. (Myers 2013, 5-13.) This thesis uses both of these research methods to collect primary data and later analyse it.

The first data collection method used is a survey. It is a widely used, systematic method of collecting the quantitative descriptors from a sample of interest. It usually aims to gather data using a standardized questionnaire prepared in advance. (Groves, Fowler, Couper, Lepkowski, Singer & Tourangeau 2009, 2-3.)

The survey was conducted among German firms specializing in machinery, automation and IT. The goal of the survey was to understand

the attitudes of German firms towards outsourcing, figure out the reasons behind companies' decisions to either practice or not practice outsourcing, and learn the numbers of those who do in fact use outsourcing practices. The survey was designed using both qualitative and quantitative research methods. The first one was used to obtain information about German firms' viewpoints, and the latter was used to gain the numerical data about the German companies. In order to receive most effective results, the survey was conducted at the trade shows such as Exhibition for Metalworking (AMB) (Messe Stuttgart 2016. Translated from German by Zhikhareva) and IT & Business fair. AMB is the leading industry exhibition for metal-cutting technology, where companies present their machine and precision tools. IT & Business is an event that brings together the whole spectrum of IT firms to exchange digital processes and solutions (Messe Stuttgart 2016.)

The survey had 10 close-ended questions. It means that a respondent had to choose answers from the list of options the researcher provided (SSDS 2011, 3). Three of them were multiple-choice questions. This type of question asks a respondent to choose a variable, that specifically applies to him, from the provided list (University of Wisconsin-Madison 2010, 9). It is preferable to include 'Other' option in order to be sure that all alternatives are covered (SSDS 2011, 3). Another type of closed-ended question used in the survey for this thesis was rating question. It means that a correspondent had to rate a number of items on a scale according to his preferences, attitudes or level of importance, for example. The meaning of the scale should be clarified in order to avoid misunderstanding. For example, if the scale is from one to five, a researcher has to explain what each number of the scale means. (SSDS 2011, 3-4.) The actual survey can be found in Appendix 1.

The second data collection method used was an interview. It is one of the main data collection procedures when it comes to qualitative research (Englander 2012, 13). Interview is an oral data collection method through talking, questioning and listening to correspondents, either an individual or a group (Silverman 2014, 50). There are four types of interviews. The first

one is structured interview, where an interviewer ask the respondents pre-prepared questions. All the interviewees answer on the same questions the same order. (Gray 2004, 215.) The second type is semi-structured interviews. This types is used to gather information about key issues and questions of the research. Some questions that have to be covered are prepared in advance, however, an interviewer can change the order and ask additional questions, if he finds it necessary for the purpose of the research. (Corbetta 2003, 270.) Another type of an interview is unstructured, which is rather flexible method to collect data. An interviewer does not have a strict structure to follow. He just leads an open conversation by asking questions related to the research topic to gain opinions, thoughts and experience from the interviewees. (Gray 2004, 216.) The last type is non-directive interview, where an interviewer opens the conversation but does not lead it, allowing the interviewee talk freely about the topic. He follows his direction and can ask only to rephrase sentences or give clearer explanation about critical points. (Gray 2004, 217; Corbetta 2003, 275.)

The author conducted a semi-structured interview of a German IT consulting company at the IT & Business trade show in Stuttgart. The semi-structured type of the interview was chosen to ask the pre-prepared key questions related to the issues of the study and get the opinion of the interviewee about the research topic. The interview was done in order to figure out the attitudes of German companies towards outsourcing and their expectations from the partner they cooperate with. The information gathered is considered to be valuable because the firm has a lot of German customers, including big players and SMEs. The questions of the interview can be found in the Appendix 2.

7.2 Data Collection

This part of the study describes the data collection process. The figure below presents the workflow of collecting data.

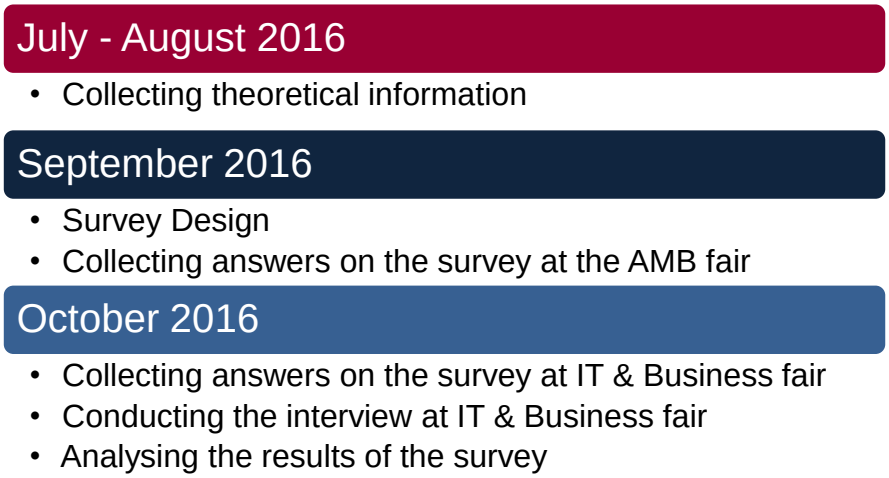

FIGURE 12. Workflow of collecting data

Data collection process started in July 2016 by gathering secondary data for the theoretical part from the reliable literature, e-sources as well as internal data of the case company.

After obtaining all theoretical knowledge needed, the next step was to prepare a survey for the companies. The survey was created by the researcher together with the managing director of local global GmbH Hans Gaeng. First of all, the survey was prepared online using Google Survey tool, and it was sent to 50 German firms via email. However, no replies were received. This is the reason why the researcher decided to visit trade shows and talk with the companies in-person.

The researcher attended two trade exhibitions in Stuttgart. The first one was AMB fair held in the middle of September, 15.09 - 16.09. The second one was IT & Business fair, held at the beginning of October, 04.10 - 05.10, where, besides the survey, the researcher conducted an interview with the German IT consulting company.

Over the course of four days spent at two trade shows thirty-seven companies were asked to participate in the survey. Nine firms out of thirty-

three chose not to share information about their outsourcing practices due to the confidential nature of the internal corporate data. In addition, five companies started to answer the survey questions, however, had to stop at a certain point due to the fact that all their operations were done in-house without the involvement of any third parties. Overall, twenty three companies fully answered all survey questions.

The month of October was fully dedicated to investigating development phases of the IT Resources Directory, analysing the survey results, and building development plan.

7.3 Data Analysis

This part of the empirical chapter presents the results obtained from the primary data. First of all, the author provides the description and analysis of the IT Resources Directory built together with the managing director of local global GmbH Hans Gaeng. Then, the results of the survey are presented using quantitative method, and subsequently analysed using qualitative method. Lastly, the key outcome interview of the German firm is introduced, and conclusions, being the valuable source of information addressing the topic of this thesis, are explained.

7.3.1 IT Resources Directory

The IT Resources Directory or, ICT Nearshoring/Offshoring Directory, is one of the potential new products of local global GmbH. It will serve as a guide to help German companies identify potential IT providers worldwide. The aim of this publication is to encourage German firms to establish partnerships with international partners. The target is to have the IT Resources Directory in two versions: printed and online. Printed version would look like a magazine, and would be distributed among German enterprises at various trade shows. Online version would act as a matchmaking platform as electronic market portal, a website with the search function that German firms can use to find suitable partners.

Content

The idea is to collect the profiles of IT providers and locate them in the Directory. The profile information would include company name, international address, address in Germany if relevant, personal contact information, website, language of communication, IT services provided, company's short description, certificates, process knowledge and business sector served, clients and countries served, methods used, potential cooperation forms, platforms and tools used, and logo of the company. Moreover, local global GmbH believes that additional relevant information should be included in the Directory besides the profiles of IT providers. This information may contain: analysis of current trends in the world of IT, and discussions about risks and benefits of international outsourcing.

Terms

In order to be part of the IT Resources Directory, an IT provider has to fill out a form posted on the local global GmbH official website. By completing the form an IT provider agrees to be displayed in the online version of the Directory for free for three months. The person who fills out the form receives the login and password for the account via e-mail that allows him to log in and update the information in the online Directory anytime without contacting local global GmbH. After three months the IT provider is contacted via e-mail offering for him to be published in the printed version of the Directory for a fee of 80 euros. The IT provider, however, can reject this opportunity, and ultimately its profile gets deleted from the online Directory.

Actions done

local global GmbH announced the idea of creating the IT Resources Directory in the year 2015 at CeBIT fair. The company did the annual official publication for the exhibition with the programme and participants of the fair. Part of this publication was dedicated to the IT Resources Directory idea. The publication then included the list of about 60 companies and the services they provide.

FIGURE 13. The IT Resources Directory preview within CeBIT magazine (localglobal 2015)

The figure above shows the publication's article introducing the topic on the left side of the page. The right side of the page presents the list of IT providers and the services they offer. The profiles of IT providers are not yet included.

In the same year, the company introduced the pre-edition version of the Directory with 10 profiles of international IT providers at IT & Business trade show. The following year at CeBIT 2016 local global GmbH did not present the publication, however, was actively looking for potential customers to be included in the Directory. Therefore, the representatives of the company were speaking with many international IT providers promoting the product. All in all, local global GmbH has collected 80 profiles of international IT providers from Romania, Ukraine, Belgium, Vietnam, Indonesia, India, Belarus, USA, Macedonia, Egypt, Armenia, Hungary, The Netherlands, Albania, Bangladesh, Russia, Colombia and China. The figure below shows the number of these companies by country.

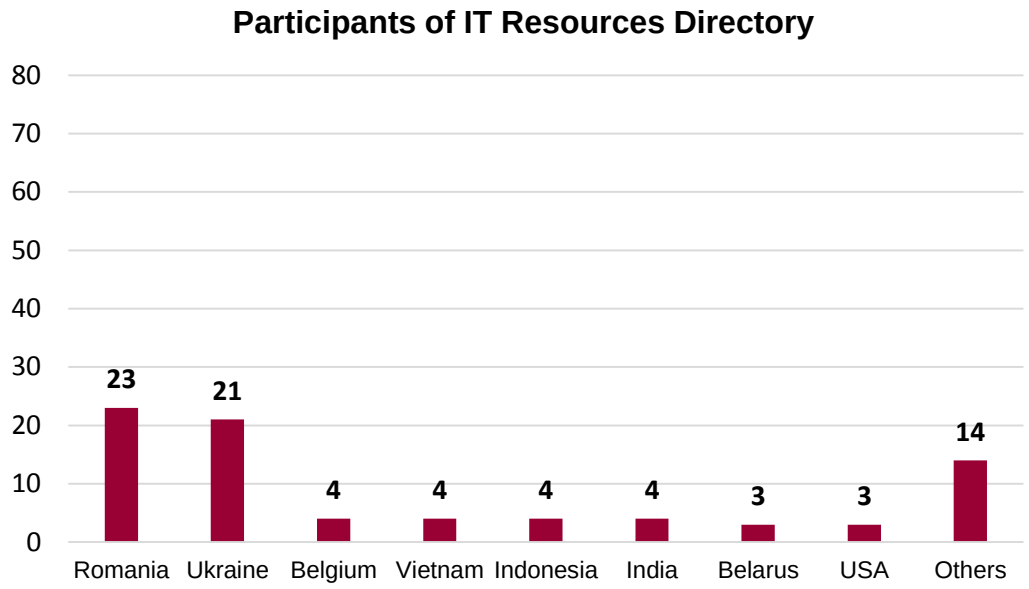

FIGURE 14. International IT providers in the Directory

It is clear that companies from Romania and Ukraine are the main customers of the Directory. local global GmbH has developed the online version of the IT Resources Directory displaying the detailed profiles of these 80 companies. Next part of this chapter provides analysis of the current online version.

Analysis of the online version of the IT Resources Directory

The current online version of the IT Resources Directory was developed with the help of IT provider from Romania who had been collaborating with local global GmbH for several years. The idea is to create a website, where a user moves back and forth between three pages. The first one is the main page with the search function called ‘search page’. After entering the website, the user completes the provided form according to his needs: services he requires, methods and forms of cooperation he prefers. The second page displays the generated list of providers who meet the requested specifications. A user views the list of companies as well as their logos and places of business. The third page is a ‘single IT provider page’, which displays a profile of a single IT provider chosen to be viewed by the user. The figure below shows the three stage journey through the website.

FIGURE 15. Website workflow

A reader can find the figures as to how all three pages within the website look like in the Appendix 3.

A researcher is not able to analyse the printed version of the IT Resources Directory, because the company has not printed one yet. The goal is to collect around 100 profiles of IT providers in the online Directory first, and then offer them the publication of their profiles in the printed version of the Directory. Therefore, in order to produce the printed version, the company has to have a finalized online version listing companies who are willing to appear in the printed Directory.

In addition to having a substantial number of IT Providers displayed in the online Directory, the website itself has to be thoroughly reviewed and well managed. It is extremely important to make sure the online version of the Directory has no technical issues and works efficiently, because this will ensure, that German companies find this service trustworthy and actively use the online Directory for the purposes of finding potential IT Providers.

The thorough review of the current online version of the IT Resources Directory was completed with the help of the managing director of the case company Hans Gaeng. The researcher's observations of cooperating with IT providers as part of her internship during CeBIT 2016 were quite helpful while evaluating the online Directory. Observation is another data collection method, which is widely used in qualitative research. It is used in many different disciplines as a tool to collect data about processes, people's behaviours and attitudes by observing, watching and recording. (Kawulich 2005, 2.)

The research paper "Website Quality Assessment Criteria" written by Moustakis V., Litos C., Dalivigas A. and Tsironis L. was used as a

foundation for analyzing the quality of the IT Resources Directory website. The paper provides hierarchical structure of criteria to assess the website. The figure illustrating these criteria is presented below.

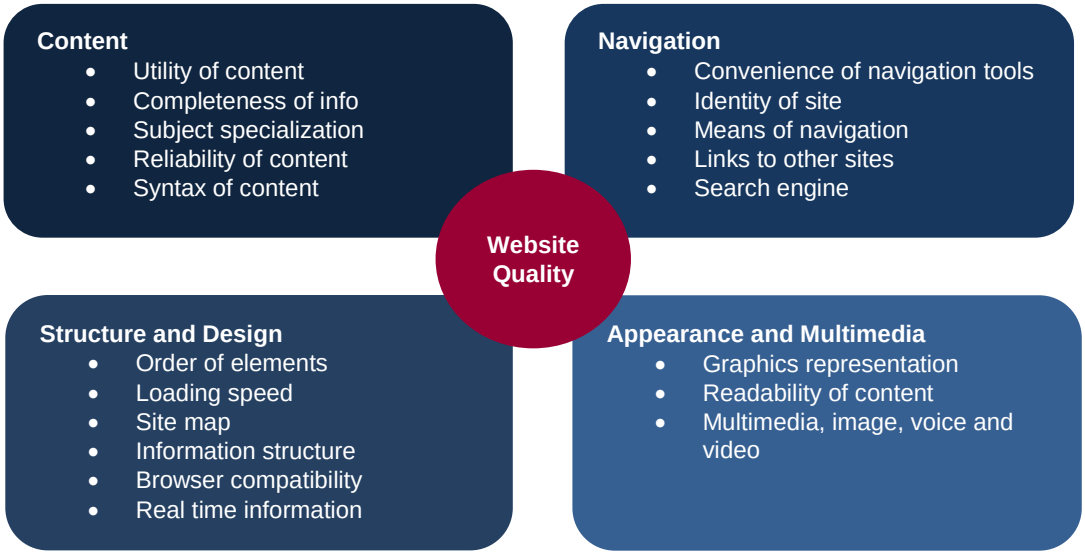

FIGURE 16. Criteria and sub-criteria of website quality assessment (modified from Moustakis, Litos, Dalivigas & Tsironis 2004, 61)

There are four main criteria to evaluate the website quality: content, navigation, structure and design, and appearance and multimedia. Each main criterion can be further divided into a number of sub-criteria. In this part of the research all criteria are explained, and the IT Resources Directory is assessed based on the above mentioned measures. The Tables below evaluate the online Directory based on each sub-criterion. In order to see how well the online Directory satisfied the necessary specifications, a certain scale was created. The ‘Rate’ column next to each sub-criterion indicates a digit from 0 to 2, where ‘2’ means that the case company has met all the requirements of the measure, and no improvements are needed. ‘1’ means that the company has partially satisfied the necessary requirements, but there are still some elements that have not been addressed. ‘0’ means that no action was taken to meet the criterion.

Content

Content criterion refers to the reliability, quality, and level of specialization of the information on the website. The main questions regarding the content are:

- *Does the provided information meet the needs of a user?*
- *Is the information of this website trustworthy?*

In order to answer these questions, the website should be assessed according to the sub-criteria. The first one is utility of content, meaning how reliable, useful and up to date the webpage is. In order to show the user that the information on the website is constantly being verified and updated, all pages have to indicate the date of the last information update. Second sub-criterion is completeness of information, which refers to the amount of valuable information available for a user. The goal is to help the user avoid any decoding, calculations, and interpretations, which may cause confusion. The next one is subject specialization. This sub-criterion refers to how specific the information about the topic is. Here are some suggestions, which may be helpful to satisfy this requirement:

A website should:

- Offer the information to satisfy specific needs of the targeted audience.
- Organize the information in a hierarchical way moving from the general statements to more detailed material and specific facts.
- Provide the right amount of information, so that a user is able to dive as deep as possible into a given topic, and complete his research when the sufficient amount of information has been obtained.

The following sub-criterion is reliability of content, meaning the correctness and trustworthiness of the data provided on the website. The last sub-criterion is syntax of content, which refers to correctness of the elements that support the content, such as images, voice and video data.

TABLE 4. The IT Resources Directory based on the content sub-criteria

Sub-criterion	IT Resources Directory	Rate
Utility of content	The information on the website is reliable, because IT providers complete their profiles themselves. Managing director of the case company Hans Gaeng developed the criteria of the IT provider's profile with IT experts in order to present only useful information for the users of the website. Moreover, IT provider who fills out the provided form, receives the account credentials, allowing him to update the profile at any time, which means the information is up to date. However, there is no date of last update indicated on any pages of the website.	1
Completeness of information	The information provided on the website is written in a way that is easy for the targeted group to understand. No additional interpretations or calculations are needed to use the data.	2
Subject specialization	The website presents the specific data that is useful to meet the needs of the targeted group. The journey through the website begins at the main search function page, and continues at the page, presenting a profile of a single IT provider chosen by the user. The user's journey ends with a page showing the detailed description of a chosen IT provider's services. The user can then contact the IT provider directly.	2
Reliability of content	IT providers complete and update their profiles themselves. However, local global GmbH does not regularly check nor reminds IT providers to update the information in their profiles.	1
Syntax of content	The elements that support the information on the website are logos of IT providers and the image representing the IT Resources Directory.	2

Navigation

Navigation criterion refers to the support provided to the user to help him orientate on the website. The support of navigation includes the availability and validity of the links, and clear structure of the website, which makes user's experience easy and smooth. The first sub-criterion is convenience of navigation tools, such as labels, links, and orientation elements. The next sub-criterion is the identity of site, which refers to website's unique elements that distinguish it from other sites as well as the correct Uniform Resource Locator (URL). Another sub-criterion is called means of navigation. Means of navigation are tools which help the user surf around

the pages. Links to other sites is another sub-criterion that refers to the useful connections to other websites. The last sub-criterion is search engines that support visibility of the website in the Internet world.

TABLE 5. The IT Resources Directory based on the navigation sub-criteria

Sub-criterion	IT Resources Directory	Rate
Convenience of navigation tools	Each page of the website has the navigation tools, which are links: directly to the list of providers and back to the search page. However, once the user enters a single IT provider page, he cannot go back to the list of providers. The only option is to go back to the search page. Moreover, even though there is a possibility to go to the home page by clicking at the logo, a user ends up on the homepage of local global GmbH, because the online Directory is linked to the case company's website.	1
Identity of site	The site does not have anything unique compared to other sites. Moreover, the website is linked to the case company's home page. Therefore, there is no specific URL. Right now it is http://localglobal.com/search%20page/	0
Means of navigation	There are navigation tools that are visible to the user. However, on some pages the user has to scroll down the page instead of clicking a button.	1
Links to other sites	There are elements that are linked to other sites, such as websites of IT providers and their emails, so that the user can contact the chosen partner directly. However, the logos of IT providers are not linked to their websites.	1
Search engines	It is quite difficult to find the IT Resources Directory in the Internet due to weak search optimization.	0

Structure and Design

The first sub-criterion of structure and design is the order of elements, meaning that the information on the website is presented in a logical and organized way. The next sub-criterion is loading speed, which can vary due to the software platform or network speed. Another one is the site map, which refers to an effective structure and design of the website regardless the content. Then goes sub-criterion informative structure, which addresses the order and compatibility of the information presented. The fifth one is browser compatibility, meaning that a website responds using different browsers. And the last sub-criterion is real time information,

which refers to the ability of the website to display the information in real time conditions.

TABLE 6. The IT Resources Directory based on the structure and design sub-criteria

Sub-criterion	IT Resources Directory	Rate
Order of elements	The information on the website is presented in a logically consistent order.	2
Loading speed	The speed of loading the pages within the websites is sometimes slow due to the software platform.	0
Site map	Even though the structure and design of the website are user-friendly, it may seem that the website is not complete yet, because the visual appearance is somewhat 'raw'.	0
Informative structure	All pages of the website connect with each other, creating clear and logical order.	2
Browser compatibility	The website does not correspond when using certain web browsers.	0
Real time performance	Sometimes there are issues displaying the information in real time performance.	1

Appearance and Multimedia

This criterion refers to the "look and feel" aspects of the user experience. It captures the use of graphics and multimedia elements on the website. The first sub-criterion is graphics representation, meaning that all graphic elements used should correspond to the purpose of the website. The next one is readability of the content, being the font of the text. The text should be easy to read from the normal viewing distance. The last sub-criterion is multimedia, which evaluates how useful, easy to use and appropriate the website images, video and voice elements are.

TABLE 7. The IT Resources Directory based on the appearance and multimedia sub-criteria

Sub-criterion	IT Resources Directory	Rate
Graphics representation	The graphic images are appropriately used, easily navigating the user around the website.	2
Readability of content	The text is easy to read and conforms with the website content.	2
Multimedia data	There are no video and voice elements. Images are appropriately used to support the content of the website. However, audio and video elements can add more flavour to the website.	1

To sum up, there has clearly been a lot of progress in developing of the online version of the T Resources Directory. Nevertheless, there are still several things that need to be improved. The researcher created the figure below by adding all the Rate digits together and converting the amounts into percentage rates. The figure summarises the website quality analysis by comparing all main criteria.

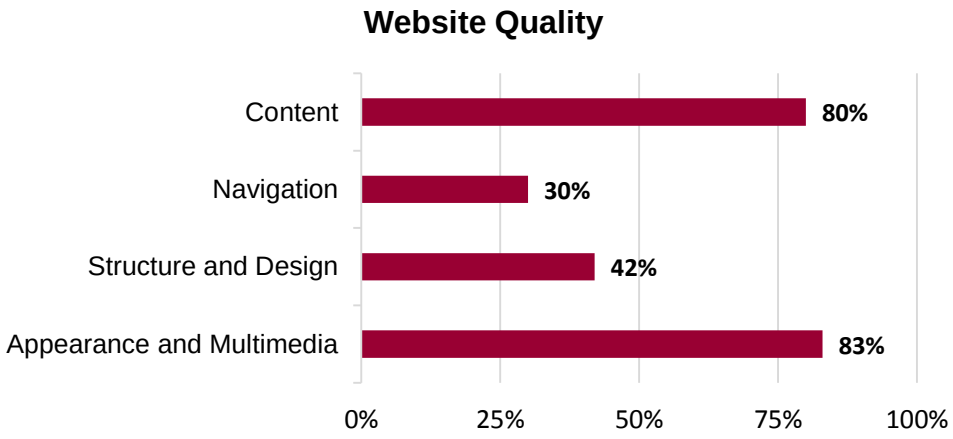

FIGURE 17. Evaluation of the online version of the IT Resources Directory

The figure shows that the major weaknesses of the online IT Resources Directory are navigation, and structure and design. Content as well as appearance and multimedia are well-developed. Nevertheless, there is still room for improvement. The recommendations as to how the case

company can improve the online version of the IT Resources Directory are described in the following chapter.

7.3.2 Results of the Survey

This part of the research presents the outcome of the survey conducted among German firms to understand their attitude towards outsourcing and their expectations from the partner they cooperate with. Each result supports by the figure.

The first question asks about the size of the company in order to indicate the majority of respondents.

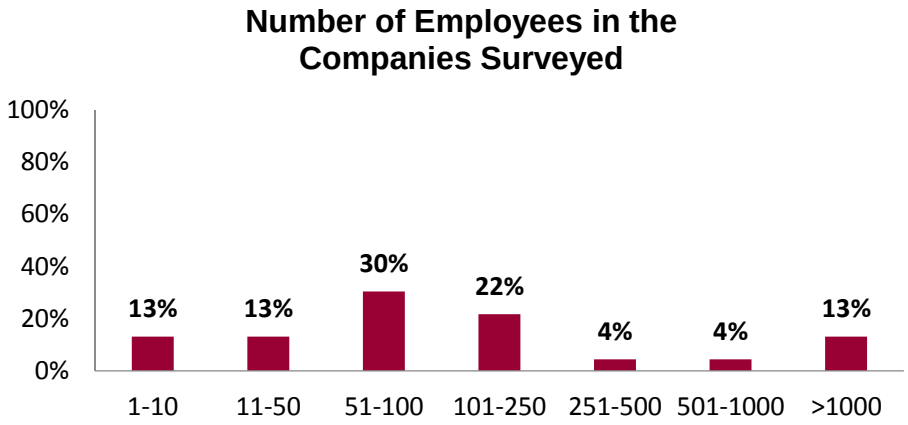

FIGURE 18. Number of employees in the companies surveyed

Most of the companies, who participated in the survey, stated they had 51 to 100 employees. The second largest group consisted of companies with 101 to 250 employees. Different countries use different criteria, such as employment, investment and sales practices to evaluate the size of an enterprise. Therefore, different sources of information use different criteria for the statistics building. According to most sources, micro companies are those with 1-9 employees, small enterprises have from 10 to 99 employees, and medium-sized companies employ somewhere from 100 to 249 employees. (Ayyagari, Beck & Kunt 2005; Kushnir, Mirmulstein & Ramalho 2010; International Labour Office 2015, 2.) Hence, most of the respondents on the survey are SMEs.

The second question asks whether the company operates domestically or on the international level.

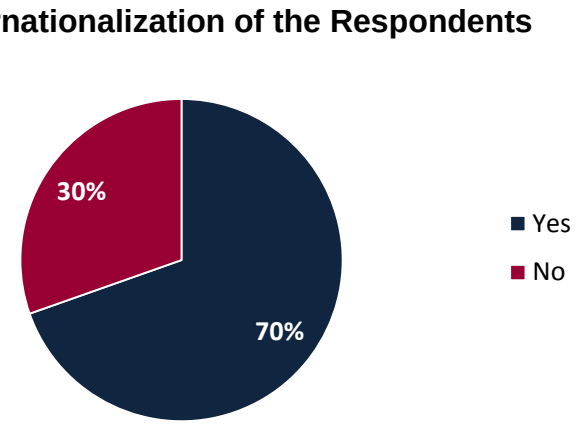

FIGURE 19. Internationalization of the respondents

More than half of respondents have branches abroad. The case company does not have preferences to serve specifically international companies or those who operate only on the German market. Both these groups may potentially be case company's customers. Thus, as responses of both domestic and international companies are taken into account, the answers to this question can provide important information for local global GmbH.

The third question in the survey asked to identify the importance of digitalization in the company's operations. The respondent could rate the importance on the scale from one to five, where one means the lowest rate of importance, and five means the highest rate.

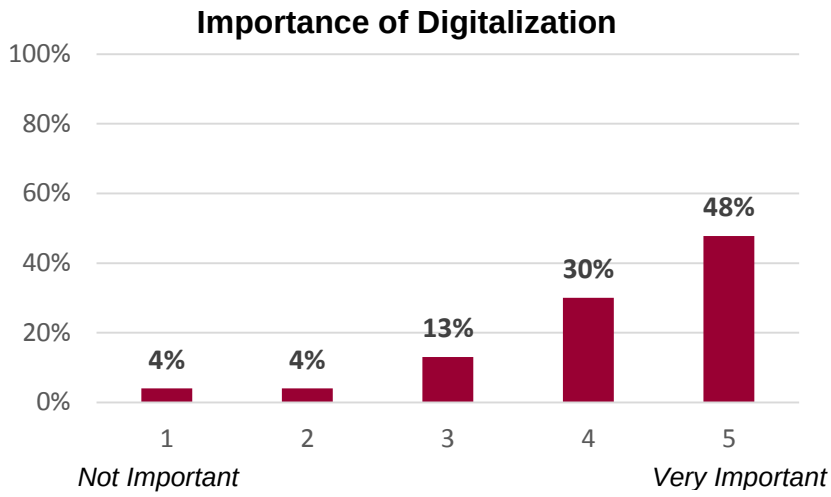

FIGURE 20. Importance of digitalization

Based on the results, most of the respondents consider digitalization to be an important aspect of business and various business operations. Moreover, all of them commented that it is more or less a rising issue.

The fourth question asked the firms whether the lack of qualified employees is an issue in the company. As question three, this question also included a scale from one to five, where one means it is not an issue, and five means that lack of qualified employees is a very serious problem.

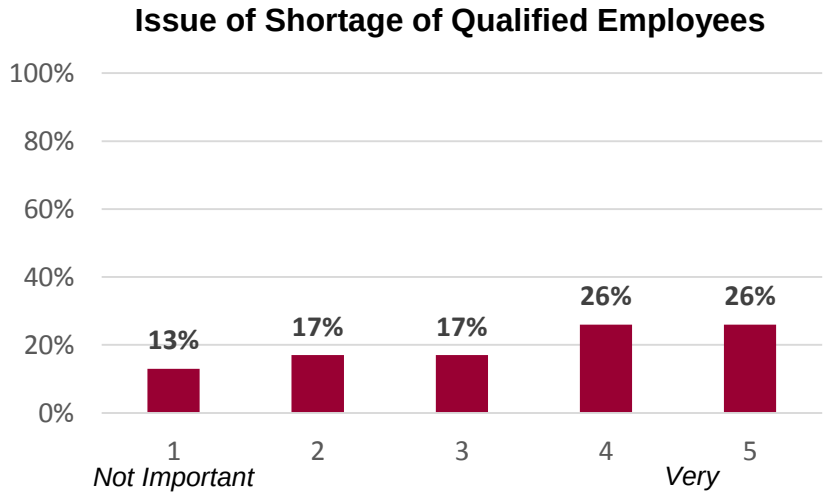

FIGURE 21. Issue of shortage of qualified employees

Most of the companies think that lack of qualified labour is a problem. More than half of respondents consider this problem to be critical.

The fifth question asked whether companies considered outsourcing to be a solution, which could have solved the issue of the lack of qualified employees during the ongoing digitalization development.

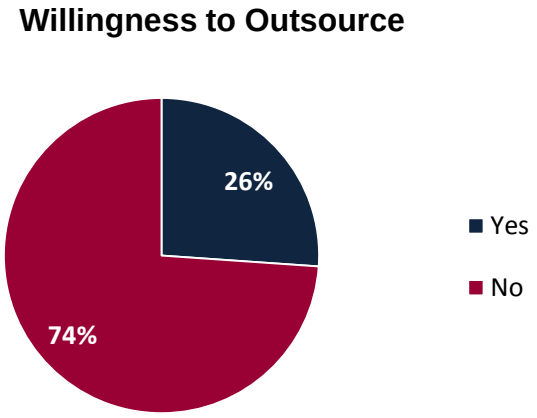

FIGURE 22. Willingness to outsource

Most of the respondents were not open to the possibility of outsourcing their operations to IT providers. Those who currently outsource or willing to do so, consider such destinations as Poland, Romania, Belgium and China.

Question six referred to the potential barriers for the companies while working with foreign IT providers. The purpose was to find out the reasons why German companies prefer not to use outsourcing. The question evaluates different barriers: language and communication, corporate culture, expertise and technology, process knowledge, product knowledge, customer orientation, price performance, company size and scalability, trust and security, reliability and punctuality, and documentation and transparency. There is a scale from one to five where one means that the barrier is not an issue, and five means that the barrier is very serious.

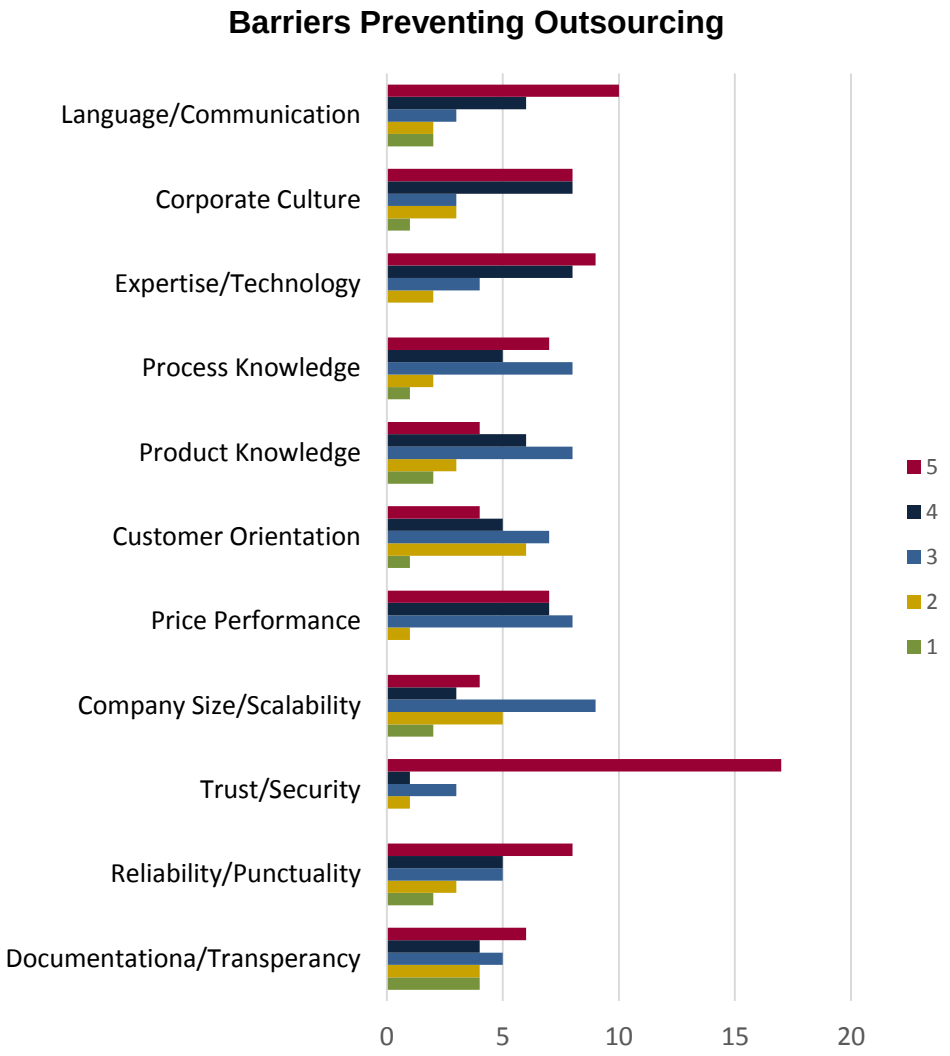

FIGURE 23. Barriers preventing outsourcing for German companies

It is noticed that trust and security create the main barrier that prevents German companies from engaging in outsourcing practices. Other barriers that are worth pointing out are language and communication, and corporate culture. There is a possibility that German companies simply do not want to deal with cultural difficulties, including different languages and different ways of managing business. Another issue that German companies are uncertain and concerned about is expertise and technology. Apparently, they are not convinced that IT providers from other countries can have better qualifications and adequate experience to tackle a task. Among other potential issues companies named the ability to adjust to the client's processes.

The next question refers to the criteria German companies go by when choosing a foreign partner to cooperate. The system is the same as in the previous question: there is a scale from one to five. Among the criteria are suggested company size, economic stability, personal trust, qualifications, availability and customer orientation, certificates, security and documentation, as well as references.

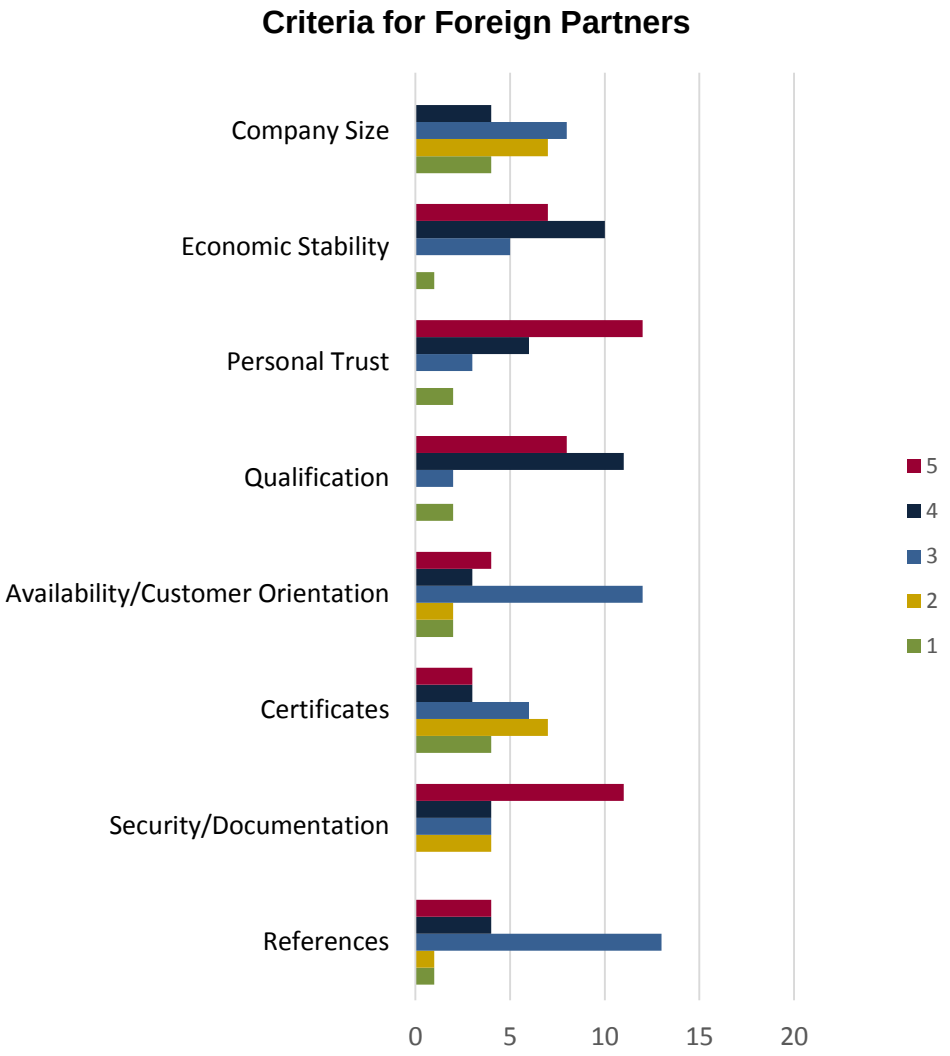

FIGURE 24. Criteria for foreign partners

The results show that the main criterion for a German company when choosing a partner is personal trust. Almost every company considers this to be the most important factor while establishing a partnership. Another important factor is the necessary qualification. A partner should not only be honest, reliable and trustworthy, but also possess the necessary skills to

be qualified to do the job. If these basic requirements are not met, a business relationship may not be created at all. Other important criteria are economic stability of a partner, and security and documentation. Many respondents stressed out the fact that German companies prefer the idea of keeping their operations in-house, no matter what.

The ninth question asked about prior outsourcing experience of German companies. Only ten companies did in fact answer this question, which means that only ten companies out of all respondents did practice or are currently practising outsourcing.

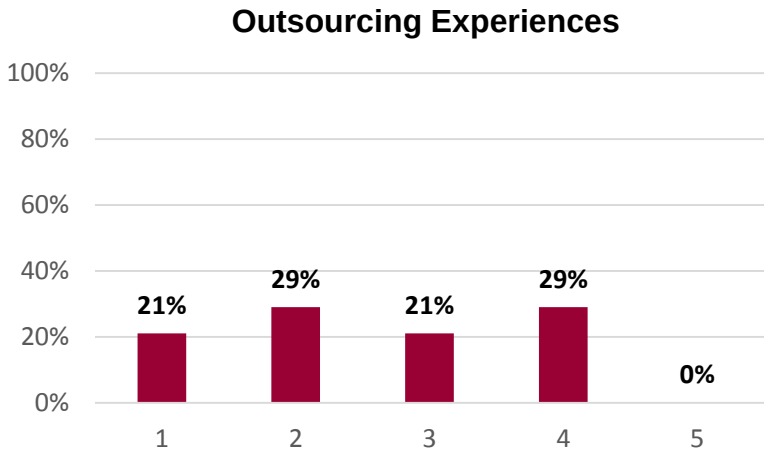

FIGURE 25. Outsourcing experiences of German companies

In this question 1 means the disappointing end-results, and five stands for the successful outcome. None of the respondents find their outsourcing experience excellent, the number of companies that have disappointing and satisfied experience is equal.

The last question refers to the ways German companies develop new business relationships: whether it is done via internet search, trade shows, partnership events, or own references and recommendations.

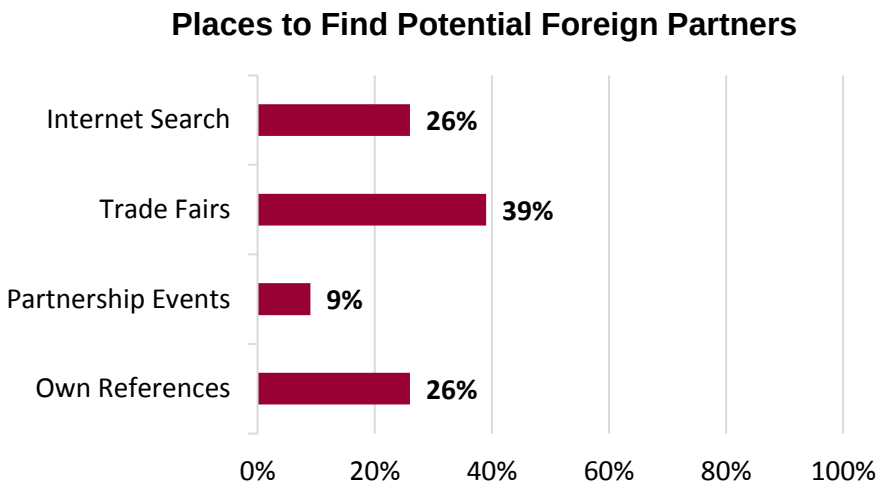

FIGURE 26. Places to find potential foreign partners

The results show that German companies tend to participate in different trade shows and exhibitions to establish valuable networks and find partners. Own references and the Internet search methods are also commonly used. Many companies mentioned that they combine trade shows and own references with the Internet search.

Most of the respondents were SMEs that operate internationally. The survey results show that German companies admit that digitalization plays a significant role in their operations, and that the lack of qualified employees is a serious problem most German companies face. However, majority of them do not consider outsourcing as a potential solution to these issues, due to trust and security reasons as well as cultural issues like language, communication, and corporate culture differences. International companies that want to cooperate with Germans have to prove their adequate qualifications and skills, and build trust in order to convince German companies to establish a partnership. Companies that have tried outsourcing or are currently using outsourcing are not entirely satisfied with the services provided. In addition to potential reasons mentioned above, and researcher's observation stresses out that cultural issues play the most significant role. Trade shows is the major way German companies seek foreign partners. However, the Internet search and own references are being used very frequently as well. The results of

this survey were analysed and subsequently used to support the findings and build a development plan for the case company, which is presented in the following chapter.

7.3.3 Key Outcome of the Interview

The interviewed company would prefer to stay anonymous in order to not harm its reputation in any way. The company was founded in 1998 and operates on an international level. Its primary focus is IT development. In addition, the company specializes in IT infrastructure support on enterprise level, which means that issues of outsourcing, offshoring and nearshoring are among company's important matters. The company's customers are approximately 40 SMEs as well as other big players in their respective businesses. Most of the customers are German firms that operate on the international market.

This part of the thesis presents the key outcome of the interview with the director of the above mentioned firm. The obtained knowledge is used to address the opinion of the interviewee on the current situation around outsourcing and Industry 4.0 in Germany. In combination with the survey this amount of information represents a solid information base.

IT outsourcing has been quite a popular topic since 1999/2000. However, it has become a less common practice among German companies in the recent years. When a German firm chooses a partner, it pays a lot of attention to subjects of personal trust, security and documentation criteria. Germans are more and more interested in the managed services of their IT business sector. IT managed services are IT tasks related to managing IT infrastructure of the company or its end-user systems. A company that agrees to provide IT managed services becomes responsible for the functionality of the IT sector, including any IT services and equipment. In other words, companies can outsource services on certain levels to the IT managed services provider and they will manage those parts/services for a client. (Interviewee 2016; CA Nimsoft MSP Center of Excellence 2012.) It is a long-term cooperation between a company and a managed service

provider. For enterprise scale companies such strategic outsourcing processes can take several years, because preparing IT for a “outcare” usually brings a lot of internal work like documentation, process definition or sharpening and others. Therefore, it is essential for German companies to choose the right cooperation partner. However, such aspects as brand reputation, security issues and cultural differences do not play for the outsourcing benefit. (Interviewee 2016.)

Germans are proud of their technological, engineering, and manufacturing sectors as well as software-based embedded systems. Germany is known for its recognition of quality and accuracy in everything. Therefore, Germany is very careful when it comes to its reputation and everything that may negatively affect it. These days German aim to promote pro-German production and, thus, have all the businesses in-house. (Interviewee 2016; MacDougall 2014, 4-7.)

Cultural differences play a big role during the course of the business partnership with the international firm. Below is an example of how culture can become a critical issue during the business relationship. There was a German company outsourcing IT functions to a firm in India. Indian culture is known for its hierarchical structure within a family, respect for elderly and collectivism. Family loyalty, integrity and unity are among core values of Indian families. (Interviewee 2016; Chadha 2016, 1; Sonawat 2001, 177.) In order to monitor the work, the partners organized Skype conferences discussing issues, changes, and upcoming projects. During one of such conferences German representatives introduced a new project and specific responsibilities of the Indian firm. However, after about an hour of discussions the Indian manager simply said that he had to go home because his grandfather asked him to. He asked his colleague to continue the conference. As it turned out, the colleague was not aware of the topic of the discussion and, thus, German company had to explain all the details of the project all over again. (Interviewee 2016.)

Language can also be a potential barrier for partners. Here is an example of how the language became an issue during the course of a business

relationship. A German company outsourced IT services to an Indian IT provider. Germans had quite a complicated project, which required the IT provider to be very detail-oriented. Upon project's completion the German company was not satisfied with the IT provider's services, as the product did not meet the requested criteria. When they tried to talk with Indian employees about the product, it was problematic to explain the specific issues, because Indian workers' vocabulary was limited. They did not possess sufficient language skills to understand the product complexity and related terminology. Thus, after multiple attempts to contact the Indian firm and discuss their concerns, German company made a decision to terminate the relationship due to language barriers. (Interviewee 2016.)

Industry 4.0 has been affecting German firms more and more while they are in the process of automating their IT sectors. However, outsourcing has not become a widely used practice during the era of digital revolution. Nevertheless, some enterprises do decide to give it a shot, and outsource their IT matters to other countries, particularly East-Europe (Poland and Bulgaria), and India in order to cut costs while getting the desired service. German firms tend to prefer onshoring in order to keep all business-related affairs in the same country and, thus, avoid cultural, language and communication problems. As price performance of German services is quite high, German firms try nearshoring if the price is less costly. Big players on the German market tend to outsource more as they possess more resources and have less risk. However, they are very careful when it comes to their reputation and things that may harm it. As a result, German companies end up opening offices and hiring employees in the foreign countries with cheap labour force. In this case, they use the benefits of the outsourcing practice, but do not officially announce that they actually practice outsourcing. This can be called "hidden outsourcing". (Interviewee 2016.) In addition, there is a new type of outsourcing which has entered the German market, but has not been widely used yet. It is called "best shoring", which refers to quality, cost-effective outsourcing being available to the company at the time it needs it the most. However, due to the high prices for best shoring, this is hardly an option for German firms.

To sum up, German companies outsource with care to minimize risk for the main business of the company. They do not tend to outsource projects but rather support or manage IT infrastructure and individual IT operations with the help of a third party.

8 DEVELOPMENT OF THE MARKETING STRATEGY

The thesis has covered Industry 4.0, which causes crucial changes in the manufacturing process. Thus, the major transformations in the value chain as well as opportunities and challenges of the new industrial revolution were described. The researcher presented a potential solution to help companies deal with digital transformations, being the practice of outsourcing. Due to delegating some operations and duties to a third party, a company can reduce costs, access external know-how and concentrate on internal core competencies. Finding the right partner is a complicated task for a company, so matchmaking and using matchmaking platforms is an approach that can help companies make the right choice. The successful outcome of these practices depends on the active involvement of an organizer. After studying all the different variables that come into play, it is time to conduct a development plan for the case company, aiming to create a matchmaking platform called IT Resources Directory. This platform should help German companies find the right partners abroad. The development plan is completed after theoretical and empirical research, and is divided into three parts. The first part presents theBusiness Model Canvas in order to analyse the target approach of presenting the IT Resources Directory on the German market. The second part provides suggestions as to how the case company can improve it to meet the needs of the targeted group. The third part focuses on the current website of the IT Resources Directory and gives recommendations as to how to develop it further.

8.1 Business Model Canvas for the Case Company

BMC is a powerful tool to illustrate how a company works and what key components, functions and operations are involved to create and deliver its value proposition. It can be used to analyse either a company or an existing product. (Goes 2014. 58-59.) The researcher chose to use BMC in this thesis, because it a suitable tool to determine key aspects of the case company’s performance and evaluate its steps towards developing the IT

Resources Directory. Based on the company's targets as well as the theoretical and empirical research, the author builds the business model specifically for local global GmbH.

Customer Segments

The IT Resources Directory has two main categories of customers. The first group consists of IT providers who want to cooperate with German firms and, thus, reserve a spot in the Directory. The second group consists of German enterprises which want to outsource IT services. These customers may use the Directory as a tool. As this study focuses only on the second group, German companies, Canvas is built to address ways as to how local global GmbH reaches German firms.

Value Proposition

The value proposition that the case company wants to deliver to German firms is the trustworthy and efficient tool to find an international business partner. local global GmbH wants to help build trust in business partnerships between German enterprises and foreign IT providers**.** The goal is to create a platform, which German companies can use in case they need to outsource their IT operations. Right now, they usually find external business partners at the trade shows, using their own references or searching the Internet. The IT Resources Directory presents another way: electronic market portal and a publication with the profiles of IT providers, who filled out their profiles themselves. This approach to finding foreign IT providers will make the search more efficient, because all the necessary information about various IT providers will be listed in one place.

Channels

There are two main ways the case company wants to deliver the value proposition. The first one is the printed version of the IT Resources Directory, a publication, which will be distributed among German companies at the trade shows and similar events. The second way is the

online version of the Directory, being the electronic market portal, which German companies can use online.

As mentioned in the previous chapter, the online version of the Directory is used as a platform to collect the sufficient number of the profiles of IT providers. The idea is to collect around 100 profiles to make the product more credible, and then start promoting the Directory to German firms. The case company, however, has not yet engaged in active promotional activities aimed at German companies, because its primary focus right now is to attract IT providers and educate them about the Directory and opportunities it brings. So far, local global GmbH has collected 80 profiles of various IT providers and placed them in the online version of the IT Resources Directory.

In order to make German companies aware of the existence of online and printed versions of the Directory, local global GmbH will reach them through trade shows, direct calls, and advertisements in different event newsletters and magazines.

Customer Relationships

In the long run, the type of relationship the case company wants to establish with German companies is self-service. This will give German companies more freedom, and make their search more efficient. In addition, the case company is considering an idea of including automated services in the Directory. One of the potential automated services will be to regularly inform German companies of new recently added profiles of IT providers, who meet the company's specific requirements. Another automated service will be to send out invitations to various business trade shows that German companies may find interesting. However, no action has yet been taken to establish this kind of relationship.

Revenue

The revenue comes from the IT providers who purchase a spot in the IT Resources Directory. More revenue is also generated from publishing information, such as interviews, articles, advertisements related to the

topic of nearshoring and offshoring in the printed version of the Directory in addition to profiles of IT providers, and have published entities pay for the publications. Advertisements and other educational materials can also be included in the online version of the Directory to increase the revenue.

Key Activities

Among the activities that have to be done so far to launch the product are improving the appearance and design of the website as well as optimizing search options though Google with the help of a professional web programmer and designer. In addition, the case company is continuing to attract IT providers by directly calling them and providing information over the phone as well as placing advertisements in different event publications. Another strategy of promoting the Directory and later launching it on the German market is creating a marketing campaign.

Key Resources

In order to accomplish the activities mentioned above, the case company should possess intellectual resources, such as a reliable programmer, web designer, and creative marketers with promotional ideas as well as financial resources to pay the wages for the services purchased.

Key Partners

There are many partners that would provide assistance in order to accomplish key activities. There are IT service providers, who can help build a visually-friendly and well-functioning electronic market portal. They include a programmer and a web designer. Other groups of partners consist of national or regional IT associations, who want to promote the IT resources of their states. In this case, they reserve spots in the Directory for several IT provides from their state in order to improve the IT sector of the countries's economy. The IPAs interested in the idea of the IT Resources Directory may also invest in its development. In addition, services of exhibition organizers promoting and distributing the product may also be very helpful.

Costs

The costs that the case company has to pay are the wages for the services provided by the programmer, web designer, and marketors. In addition, the case company has to pay for editorial services as well as printing of the publication version of the IT Resources Directory. Last but not least, there are additional stand rental, travel and accommodation expenses associated with case company's trips to attend various trade shows, for the purposes of networking and promoting the product. However, having a stand at the trade shows has not been very effective because the entire local global GmbH team is usually busy attending personal meetings during the course of the exhibitions. The case company follows the logic that it is more efficient to actively pursue and initiate conversations with company representatives rather than stand in one place and wait for them to stop by your stand. (local global GmbH 2016.)

8.2 Action Plan for the Case Company

Based to the survey conducted, most of the respondents have branches abroad, which means that they cooperate with international partners quite often. Moreover, most companies admit that digitalization plays a major role in their business operations nowadays, and according to the interview, the IT sector has to automated in order to stay competitive on the market and keep up with the changes caused by Industry 4.0. Qualified workforce helps companies manage their IT sectors. Therefore, valuable partners and employees are in a great demand. According to the survey, many companies believe that lack of qualified employees is a serious issue. Some companies responded saying that it is a rapidly growing problem, which they may have to deal with in the nearest future. Even though none of the respondents finds their outsourcing experience excellent, the number of companies satisfied with the services matches the number of

those which were not satisfied with the services they have received. Based on these facts, the researcher states that the IT Resources Directory has a great potential to be successful on the German market. However, there are still many things to be done to improve the product. Based on theoretical and empirical research as well as BMC, the following chapter presents the suggestions as to how the case company can develop and improve the IT Resources Directory further.

8.2.1 Reaching German Companies

According to the survey, most German companies do not consider outsourcing a reliable option to advance the flow of their operations. Moreover, those who have tried to use outsourcing confirm that their expectations and requirements have not been fully met. None of the respondents was fully satisfied with the provided outsourcing services, and quite many rated their outsourcing experience pretty low.

The goal of the case company is to change negative attitudes German companies have towards outsourcing. Among ways to achieve that, local global GmbH could publish reviews and testimonials of positive outsourcing experiences on its website and social media. Reading about successful partnerships may turn German companies' negative attitudes into curiosity. Thus, they may consider looking into outsourcing opportunities and perhaps give it a second shot. According to the survey, German companies tend to use trade shows, the Internet and own references to look for the partnerships. Similarly, German companies would also turn to the Internet and own references when looking for outsourcing opportunities. They are not likely to look for partners at the trade shows as it requires a lot of time and other resources. The case company cannot influence the decision of German firms to use their internal references, but it can reach them by advertising the Directory via Internet. Therefore, the case company is advised to take the following actions.

Firstly, local global GmbH has to improve search optimization of the online version of the IT Resources Directory via Google so that German firms can easily find the website. The longer a user browses the Internet, the higher the possibility is of him finishing the search before visiting the IT Resources Directory website. Secondly, positive reviews and comments about German outsourcing practices should be posted by German firms on the main page of the website. Positive feedback will increase the possibility of keeping a user on the website and making him proceed to the search page.

The survey and the interview showed that the main barriers for German firms when engaging in outsourcing are trust and security, language and communication, expertise and technology, corporate culture, brand reputation and cultural differences. It is then recommended that the case company does the following to help German companies overcome the above mentioned barriers.

The first thing local global GmbH should do to address the issue of trust and security, which is also the main criteria for choosing a prospective foreign partner, is to monitor the forms IT providers fill out in the online Directory. Before displaying the profile of an IT provider, the case company should verify the reliability of the information provided. The process of the tracking system should be available on the website, so that German firms find the platform credible and trustworthy.

Second of all, the case company should establish partnerships with consulting and legal agencies. In case a German firm needs guidance in regards to contracting with the IT provider, special agencies can quickly provide assistance. The list of these consulting firms and their contact information may be listed on the website. This will show German firms that local global GmbH, being a matchmaker, has partners who can protect German companies' rights and help them make a decision.

Thirdly, the case company is advised to create a co-creation platform within the IT Resources Directory. Co-creation means the practice of

engaging customers to evaluate the company's value proposition by, for example, leaving reviews (Osterwalder & Pigneur 2009, 29). German companies will be able to share their experiences using the website and suggestions of how to improve it. Web reviews and feedbacks about purchased products or services can greatly influence and support customer's decision-making process. These aspects have become very helpful for the companies in trust-and-reputation building. (Lackermair, Kailer & Kanmaz 2013, 1.) If German firms, which had visited the online version of the IT Resources Directory at the first time, saw positive feedback about this platform, they would trust it more.

The second serious barrier for German companies when choosing an international partner is language and communication aspects. The case company requests IT providers to specify the language the employees use for communication in the initial form. However, this field is not mandatory to fill in. Thus, the first recommendation from the researcher is to make it compulsory to indicate the language of communication. Based on the examples from the interview, language barrier can be a serious issue. Therefore, the researcher advises local global GmbH to establish partnerships with translation agencies in case German firms need to use such services on a short notice.

The third barrier is expertise and technology. In order to show the expertise of IT providers, their profiles include information regarding: IT services provided, certificates, process knowledge and business sector served. These profiles can still be improved by adding additional fields. Firstly, the case company may request IT providers to attach their certificates to their profiles. Even though, according to the survey, many companies do not pay much attention on availability of certificates, visual proof of having them can have a positive influence on trust-building. Secondly, IT providers could present the work done for other clients, if it is possible, in order to demonstrate their performance. In addition, there may also be an option to download a demo of an IT provider's services and products. Last but not least, it may be helpful to have the list of specific technology IT providers use to accomplish the tasks.

The last main barrier German companies face when cooperating with international IT providers is corporate culture. The challenging aspect is that corporate culture has visible and invisible individual features of the ways the organization functions (Mowat 2016, 3). If two business partners have too many differences in their corporate cultures, it can harm productivity, quality, and partnership (O'Donnell 2008, 1-2). In order to avoid the issues caused by corporate culture, the case company could request IT providers to add information in their profiles about their corporate values, decision-making process, and attitudes towards taking risks. In addition, local global GmbH may publish some articles and interviews about common characteristics of German corporate culture, so that IT providers could use it as a guide when working with Germans. It is also recommended to implement a reader tracking system, which will show the number of people who have read reviews and articles.

There are several criteria German companies have for prospective IT partners. The most important ones are personal trust, qualification, security and documentation as well as economic stability. As mentioned above, in order to verify IT provider's qualifications, an option to download the company's certificates and demos of prior work should be available. As for security issues, the recommendation is to have consulting and legal agencies as partners, who could provide their services on short notice. It takes time to build personal trust. As reviews and feedback play a major role in trust-building (Lackermair, Kailer & Kanmaz 2013, 3-4), the researcher recommends that the case company creates a 'References' section on each IT provider's page, where previous customers can leave reviews. In the long-run, this review system could turn into a rating scale, displaying IT providers with the highest number of positive reviews first in the list.

As for economic stability, IT providers should have an opportunity to add financial information about their revenue, debts, and other resources (Blajer-Gołębiewsk 2014, 198). However, local global GmbH should not request this data to be mandatory, as some IT providers may not be willing

to share this information. Nevertheless, such details as years in business and fees breakdown should be presented (Blajer-Gołębiewsk 2014, 198).

The last recommendation refers to the channels the case company uses for promoting the IT Resources Directory. All advertising activities are performed at trade shows, personal meetings or with the help of printed materials and direct calls. Based on the results of the survey conducted, most of the respondents use trade shows, own internal references, and the Internet to look for the international partners. Therefore, it is strongly recommended that local global GmbH places great emphasis on web advertising. The case company has exhibition organizers as their key partners to distribute and promote the printed version of the Directory. However, it would be useful to cooperate with them in order to also advertise the online Directory on the official websites of trade shows. This will increase visibility of the IT Resources Directory in the online space.

Based on primary data collected and BMC, the researcher organized all the recommendations into four categories: development of the online version of the IT Resources Directory, partners, single IT provider page and finance. The table below lists the categories and corresponding suggestions to improve performance in each category.

TABLE 8. Suggestions for the case company

Category	Actions
Online version of the IT Resources Directory	✓ Create Automated services ✓ Post interviews and articles ✓ Improve search optimization ✓ Publish positive reviews and feedback ✓ Monitor new IT providers ✓ Create co-creation platform
Partnership	✓ Establish new partnership with exhibitions' organizers ✓ Find professional programmer and web-designer ✓ Look for national or regional IT associations ✓ Establish partnership with legal, consulting, translation agencies
Single IT provider page	✓ Make language of communication criteria compulsory ✓ Upload certificates ✓ Present the prior completed work ✓ List technology used ✓ Write about corporate culture ✓ Add an option to provide financial facts
Finance	✓ Reduce costs on stand, travelling and accommodation ✓ Increase revenue through posting materials ✓ Look for financial support from IPAs

The researcher recommends that case company focuses on posting interviews and articles related to outsourcing and German corporate culture on the website and social media. Another suggestion is to place reviews and customers' feedback about the platform on the main page of the website. The case company should also develop a user tracking software, and subsequently certain automated services. Other recommendations include improving search optimization, monitoring the information posted by the IT providers, and preparing to develop a co-creation platform within the website for information exchange purposes.

As for partners, the research states that it is important to establish new partnerships particularly with a web-designer as well as national or regional IT associations, consulting, legal and translation agencies. Moreover, the case company should strengthen the partnership with exhibitions' organizers for a chance to be promoted on their official websites.

In order to build trust and prove the credibility of the IT providers on the single IT provider page, the case company should request the IT providers to specify the language of communication, upload certificates, present the previous work done, discuss their corporate culture, and present financial facts about the company including standard rates and years in business. Moreover, the case company could create the 'References' section, where previous customers can leave reviews.

Last but not least, the case company could reduce costs by eliminating a stand at the trade shows. Company can increase their revenue by charging those who want to post articles on the website. However, it is recommended to publish materials for free until the website is fully developed. The case company should also seek financial support from IPAs.

8.2.2 The Online Version of the IT Resources Directory

As mentioned before, it is extremely important to verify the online version of the Directory has no technical issues and is visually-friendly, to make sure German companies find the platform trustworthy. Therefore, based on Website Quality analysis, the researcher gives concrete suggestions as to how the case company can improve the website of the IT Resources Directory to attract German companies.

The first suggestion is to place great emphasis on the reliability of data. The company has to display the date of the last update at the bottom of each webpage to ensure the information is up-to-date. An IT provider has an option to revise and improve his profile without contacting local global

GmbH, which makes the experience user-friendly and convenient. However, the case company has to carefully monitor this self-service approach. local global GmbH receives a notification when an IT provider completed the form to join the online Directory. The case company has to then review the profile to see if there are any visual and content errors. The researcher also suggests to send monthly reminders to IT providers asking them to review and update their profiles, as needed. If a German company comes across some unreliable data presented on the website, local global's reputation may be jeopardized.

The second suggestion for the case company is to improve the navigation system of the website. There are three pages within a website: search page, list of IT providers' page and a single IT provider page. It is necessary to have the buttons allowing to go back to each of these pages. Therefore, all pages have to have 'Back to search' and 'Back to the list' buttons. Is also advised to add the "Save" button on the page of each single IT provider, so that the user can save most appealing profiles for future reference. This way of narrowing the list of IT providers will help the user make a final decision.

Another issue to be addressed is the URL of the IT Resources Directory. The website is currently linked to local global GmbH official website. Accurate and short URL is one of the main criteria of a successful website, which should be easy for users to find (Kraaij, Westerveld & Hiemstra 2002). It is recommended to create a separate, short URL for the online version of the IT Resources Directory as soon as possible.

The next suggestion refers the links to other sites. The links on a single IT provider page allow a user to visit IT provider's website and contact him directly via email. The link to the website is presented as a URL link. The page also includes IT provider's logo, however, no links are added to the image. The logo of a company is its strongest visual component that shapes the reputation of a brand (Park, Eisingerich & Pol 2011; Biricik 2006). Thus, the researcher's advice is to add a link to logo images, so

that visitors are instantly redirected to IT provider's official website once they click on provider's logo.

The appearance of the website seems unfinished due to the fact that it was built by a programmer without a professional graphic designer's expertise. Therefore, the design of the website appears to be too simple and raw. The researcher recommends that local global GmbH asks a professional web designer to improve the appearance of the website.

Such enhancements as search optimization via Google, loading speed, browser compatibility and real time performance of the information on the website are critical according to the analysis. Due to the lack of expertise, the researcher recommends that the case company discusses these features with both IT provider and web hosting provider. It is crucial that the website functions and responds well, because local global GmbH's reputation is at stake.

9 CONCLUSIONS

After all important concepts have been discussed in the theoretical part, with the primary data collected and analysed, and development plan conducted, the thesis can now proceed to the conclusion of the study. This chapter presents the findings of the paper and answers the research questions. Moreover, reliability and validity aspects of the research are explained, and the ideas for further studies are suggested.

9.1 Answers to the Research Questions

The research focused on Industry 4.0, as the new digitalization revolution, and outsourcing of IT resources, as the possible option for German companies to address issues Industry 4.0 introduced. The case company wants to create a platform called the IT Resources Directory to help German companies look for international IT providers. Therefore, the research question was set as follows:

How can the case company develop the IT Resources Directory to meet the needs of German companies?

The answer to this question is given later in this chapter. First of all, the answers to the sub-questions are presented:

What is Industry 4.0 and how does it affect companies' operations?

The term Industry 4.0, originated in Germany, refers to the rapid transformation of the manufacturing process and the production sector due to the full digitalization of the conventional industry. All participants of the value chain are digitally connected with each other via wireless network. Implementation of Industry 4.0 in reality is based on the development of the following technologies: ICT, ICT-based support, CPS, network communication, and simulation and ability to collect big volumes of data.

Industry 4.0 opens new opportunities for the companies to operate on the market. The operations within the manufacturing and production sectors

have become more flexible due to efficiency of data exchange and the ability to standardize the flow of material, energy and information. Companies are able to produce small quantities of goods as the machines can be configured anytime during the production process. Digital design and modelling also save companies extra time and resources. Moreover, there is an increase in productivity because of the automated robots allowing continuous production with little human supervision. As a result, human workforce can be used more efficiently in other business operations. The customer's role has become more significant as he can actively participate in designing and production processes. Last but not least, businesses are starting to switch from cost-driven to value-driven business models.

On the other hand, there are many challenges companies face when implementing Industry 4.0 into their operations. Among them is the need for high investments, and the possibility that the companies may be forced to cooperate with their competitors to identify the standards of exchanges. This happens due to the fact that complex value network requires all participants of the manufacturing process to communicate with each other. Another challenge is related to data ownership, security of information and various legal issues. The most important requirement for successfully implementing Industry 4.0 is highly qualified staff with experience in production, mechanical and process engineering, automation engineering, and IT. It is, however, quite problematic to find the employees who are experts in all these fields. Moreover, reliable and efficient IT infrastructure is a crucial element enabling interactions between all the users of the value network. Therefore, the existing IT infrastructure has to be improved to facilitate high-volume information flow and time-critical data exchange. Other challenges include low maturity level of necessary technologies, lack of prioritisation and insufficient network stability.

What is outsourcing?

Outsourcing is the act of relocating a certain business operation to the third party in order to reduce costs, focus on core competencies of the

business, get access to the external know-how, increase flexibility or productivity, and minimize risks. Traditionally, there have been three ways of conducting outsourcing. Onshoring can facilitate the procurement of materials or services from the external provider who is located in the same country. Nearshoring is way to cooperate with the external provider who is located in a neighbouring country. Offshoring is the third type of outsourcing where the company partners with a third party located outside the country.

What is matchmaking and the role of an organizer in this process?

Matchmaking is the process of connecting two or more parties together to establish a mutually beneficial partnership. There are many ways to arrange matchmaking: electronic market portal, events at trade fairs and exhibitions, hosted buyer programmes, stand-alone matchmaking, business delegations, sector-specific and multi-sector events. The matchmaking approach is chosen based on the nature of the company's business, location and organizational structure. A matchmaker is a person organizing matchmaking events or platforms. He should possess many skills and competencies to be able to analyse specific needs of both parties, set up a pleasant meeting environment for them, and form a successful match. He has to know a lot about the business sector he operates in, have excellent communicational and organizational skills as well as be active, friendly, and sometimes tough.

What are the needs of German companies during Industry 4.0 development?

German companies need to tackle the following problems: processing and monitoring know-how of employees, development of data security and safe systems, end-to-end connectivity using wireless networks, and standards for data transfer. Companies need financial resources to make investments in the required fields, qualified employees to work on the processes related to Industry 4.0, and guidance in regards to standards, regulations and forms of certification related to Industry 4.0.

The IT Resources Directory wants to solve a problem of the shortage of qualified employees. Therefore, the study presents the needs of German firms in regards to human workforce. Employees should have experience in the fields of production, mechanical and process engineering, automation engineering, IT and the Internet. Moreover, they have to be able to adjust to the company's processes. German companies prefer that employees possess strong German language skills to avoid communication barriers. Trust and reliability are also very important factors when it comes to hiring processes.

What are the attitudes of German companies towards outsourcing?

According to the McKinsey survey, more than a half of the respondents are willing to practice outsourcing, but some are quite concerned about potential cybersecurity issues. Based on the empirical part of this research, more than a half of survey respondents tend to avoid outsourcing due to cultural differences, security issues and little control of outsourced operations. Some German firms have policies which do not allow them to outsource any operations, thus, they want to promote pro-German production, which means that they want to handle all operations in-house.However, many German companies have offices in the countries where the labor costs are much lower than in Germany. This thesis referred to this type of practice as 'hidden outsourcing', as the company theoretically does not relocate business operations to a third party, but in reality uses external labour to reduce costs, and increase quality and productivity. Nevertheless, there are still some companies that practise outsourcing and are satisfied with the services they receive.

What is the current developmental stage of the IT Resources Directory?

The IT Resources Directory has two versions: printed and online. The online version acts as a platform to collect profiles of IT providers and as an electronic portal where German firms can search for IT providers. Once there are around 100 profiles in the online version, the company will start developing the printed version. Therefore, at this time the current

development phase of the online version of the IT Resources Directory is described.

The case company has developed the online Directory with the help of an IT provider from Romania. The website has three main pages: search page, list of IT providers' page and a single IT provider page. According to the website quality analysis, the content, appearance and multimedia aspects are done well even though may still be enhanced later. The features that need to improved are navigation system of the website, including navigation tools, structure and design. The online Directory currently has 80 profiles of IT providers from different countries. Most of them are from Romania and Ukraine.

After answering the sub-questions of the thesis, the researcher is able to give an answer to the main research question that was set as follows:

How can the case company develop the IT Resources Directory to meet the needs of German companies?

The research conducted proves that the IT Resources Directory does have the potential to be useful for German companies. Right now German firms look for IT providers at trade shows and online, and this is exactly where the product is promoted. The IT Resources Directory will be available online as an electronic market portal and in the printed version as a magazine. The online version is used as a platform to collect the profiles of IT providers and as a platform for German companies to look for IT providers. It is a matchmaking platform for these two parties to meet. The printed version of the Directory will be prepared after IT providers give consent to have their profiles published in it. Therefore, the research was mostly focused on developing the online Directory, because the more IT providers are signed up for the online version, the more reliable the Directory will look for German firms.

Based on the primary data collected through the interview, survey, website quality analysis, and BMC, it can be concluded that local global GmbH has to make a lot of improvements to make the IT Resources Directory work.

The case company needs to pay a lot of attention on the design and functionality of the website. Therefore, it needs to cooperate with an efficient programmer and a professional web designer. Moreover, the company has to focus on the trust building aspect, as it is the main criterion for German companies when looking for partners. It may be beneficial to establish new partnerships and create It may be beneficial to establish new partnerships and create platforms, where German firms can leave positive reviews about using the IT Resources Directory as well as prior outsourcing experiences. It is also important to keep developing the single IT provider page. It should contain more proof of IT providers' qualifications, economic stability, and corporate culture, because German companies pay attention to these criteria in a prospective partner. Achieving all these goals is quite costly, that is why the case company should increase its revenue by posting materials on the website and trying to get financial support from IPAs. If the company had enough monetary resources, it would be able to implement all the necessary changes and make the product ready sooner.

9.2 Validity and Reliability

Any research has two fundamental assessment criteria: validity and reliability. The first one refers to the accuracy of the measurements of different concepts within the research. The second one refers to the question whether repeating the experiment, test or any other procedure within the research will lead to the same result. (Cermines & Zeller 1979, 11.)

The purpose of the research is to answer the main research question and all sub-questions. This thesis was able to accomplish this purpose. Theoretical knowledge was collected through different academic sources such as academic books, journals as well as credible Internet sources. Most of the sources were published less than five years ago and contained up-to-date information. Empirical data was gathered through primary sources of information: interview with the German IT consulting

company and the survey conducted among German firms, mostly SMEs, at two different trade shows. There was a total of twenty-three respondents to the survey. The vast majority of the respondents had similar opinions about the issues addressed in this thesis, that is why it can be concluded that the research is valid, reliable and adequately represents the attitudes and perspectives of German companies towards the industrial evolution, IT outsourcing and matchmaking platforms. The sample size is sufficient to consider this research a good contribution to the field and a reliable starting point for further analyses and research on the topic.

9.3 Suggestions for Further Research

As mentioned in the beginning of the thesis, the study focuses on the first group of the Directory customers - German companies - and their attitudes towards IT outsourcing. The goal is to use this knowledge to make significant improvements to the IT Resources Directory. In order for the product to meet the needs of international IT providers, being the second group of the Directory customers, further research may be conducted focusing on IT providers willing to partner with German companies. As local global GmbH is a matchmaker, it needs to possess substantial knowledge about both groups of customers.

In addition, similar research may be conducted separately for SMEs and big players, because, based on the answers to the survey and the interview with IT consulting company, big players tend to outsource more business functions and operations compared to SMEs.

10 SUMMARY

The aim of the study was to gain a deeper understanding of the new industrial revolution, Industry 4.0, as well as introduce outsourcing as a potential solution for German companies to solve the issues caused by the new digital era. The goal was to give the case company local global GmbH suggestions as to how it can improve its IT Resources Directory, being a matchmaking platform for German companies and worldwide IT providers.

The theoretical part of the research covered the existing literature on the topic of Industry 4.0 and outsourcing. Moreover, the author introduced the case company as a matchmaker and, thus, gave an explanation of the matchmaking concept and the role of an organizer. As the researcher chose BMC to indicate main components and functions involved in the development process of the IT Resources Directory, the theoretical framework of this business model is presented in the research as well.

The final goal of the study was to suggest the effective ways of developing the case company's IT Resources Directory to attract German enterprises. Therefore, the researcher conducted a survey among German companies as well as an interview with the German IT consulting agency to identify their attitudes towards outsourcing practices and criteria for choosing an international partner. Based on theoretical and empirical research, BMC for the case company was built, and the current version of the Directory was investigated according to the website quality assessment criteria. The researcher then provided recommendations for the case company as to how to improve the online version of the IT Resources Directory and advertise it to German companies.

The findings of the research revealed that companies have little control over the transformation of their manufacturing and production sectors caused by Industry 4.0. Although not all German companies enthusiastically support outsourcing, there is still a great potential for the IT Resources Directory to be a useful resource to find international partners. To reach this goal, local global GmbH should primarily focus on

improving the online version of the Directory. Subsequently, the case company needs to conduct a strong marketing campaign aimed at German enterprises.

The researcher wants to give additional recommenadtions based on her own observations. The case company and its employees should consider improving their time management and organizational skills to make the business run more effectively. In order to successfully develop the IT Resources Directory, the case company needs to be able to quickly adapt to continuous changes and innovations in the field.

Moreover, as many German companies prefer to engage in onshoring rather than near-or-off-shoring, in addition to foregn IT providers, it may be beneficial for local global GmbH to include German IT providers in the IT Resources Directory to attract more German companies.

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APPENDICES

APPENDIX 1. Survey

Survey IT Resources

This survey is made in order to gather information about the German companies and the challenges they face regarding digitalization. By filling in this paper you help two students to finish their bachelor and master thesis regarding the issue mentioned. Your help will be very appreciated. Thank you.

General Information

1. How many employees does your company have?

- ◯ 1-10
- ◯ 11-50
- ◯ 51-100
- ◯ 101-250
- ◯ 251-500
- ◯ 501-1000
- ◯ More than 1000

2. Does your company have branches abroad?

- ◯ Yes
- ◯ No

Digitization and qualified employees

3. How important is digitization in your company?

	1	2	3	4	5	
Not important	◯	◯	◯	◯	◯	Very important

4. Is the lack of qualified employees a problem for your company?

	1	2	3	4	5	
Not a problem	◯	◯	◯	◯	◯	Big problem

5. Is outsourcing an option for your company?

- ◯ Yes
- ◯ No

6. If outsourcing is an option, which regions would you consider?

Your answer

7. How serious are these barriers to your company for cooperations with foreign companies ?(1-not serious at all, 2-slightly serious, 3-serious, 4-fairly serious, 5-very serious)

	1	2	3	4	5
Language / Communication	○	○	○	○	○
Corporate culture	○	○	○	○	○
Expertise, technology	○	○	○	○	○
Process knowledge of a partner	○	○	○	○	○
Product knowledge of a partner	○	○	○	○	○
Customer orientation of a partner	○	○	○	○	○
Price-performance	○	○	○	○	○
Company size, scalability	○	○	○	○	○
Trust, security	○	○	○	○	○
Reliability, punctuality	○	○	○	○	○
Documentation, transparency	○	○	○	○	○

Other

Your answer

8. How important are these criteria when choosing a foreign business partner?(1-not important at all, 2-slightly important, 3-important, 4-fairly important, 5-very important)

	1	2	3	4	5
Company size	○	○	○	○	○
Economic stability	○	○	○	○	○
Personal trust	○	○	○	○	○
Qualification	○	○	○	○	○
Availability, customer orientation	○	○	○	○	○
Certificates	○	○	○	○	○
Security, documentation	○	○	○	○	○
References	○	○	○	○	○

Other

Your answer

Outsourcing

9. If your company made experiences with foreign companies, how were they overall?

	1	2	3	4	5	
Not good	○	○	○	○	○	Very good

10. How does your company acquire new business relationships with foreign companies?

- ○ Internet search
- ○ Trade fairs
- ○ Partnership events
- ○ Own references and recommendations

Other

Your answer

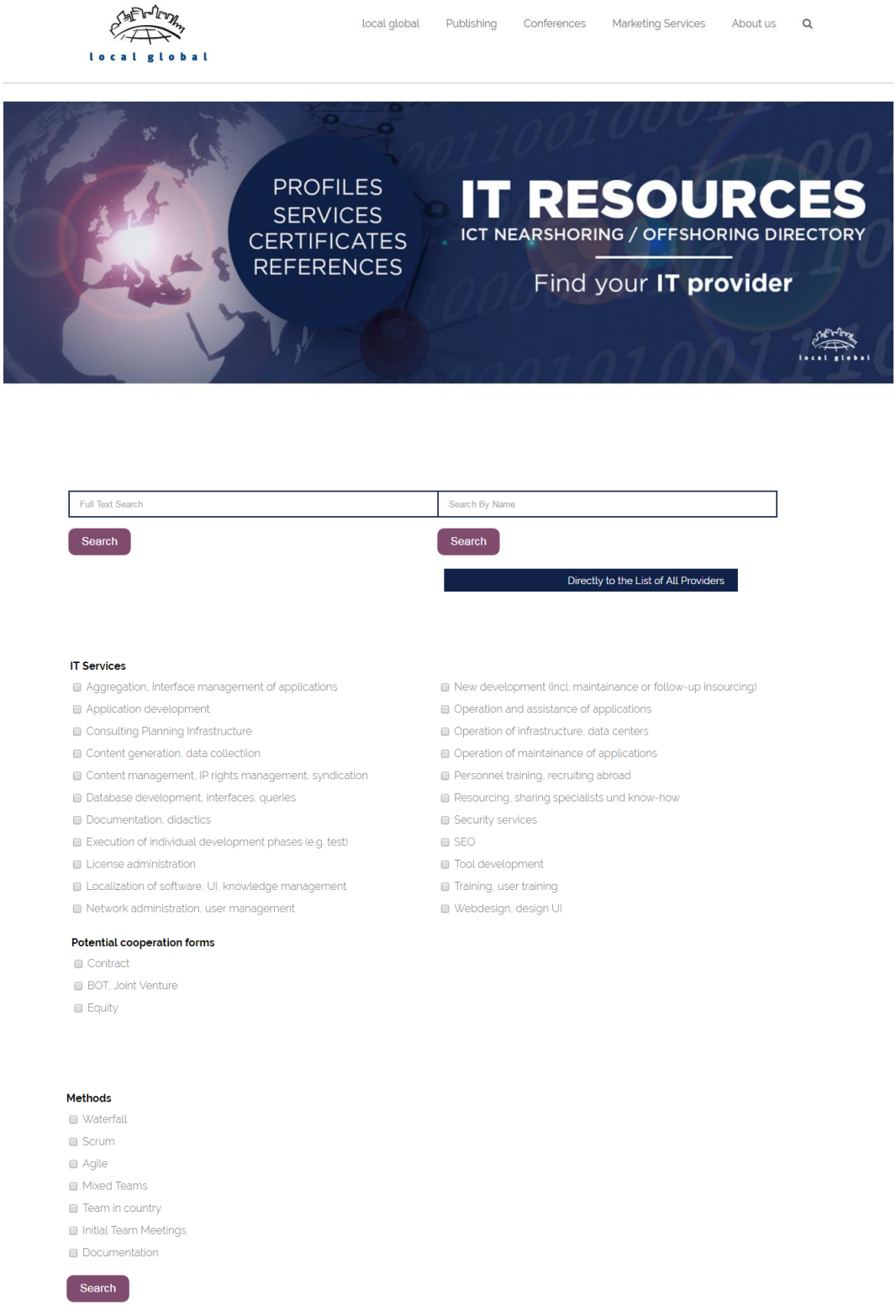
SUBMIT

APPENDIX 2. Interview

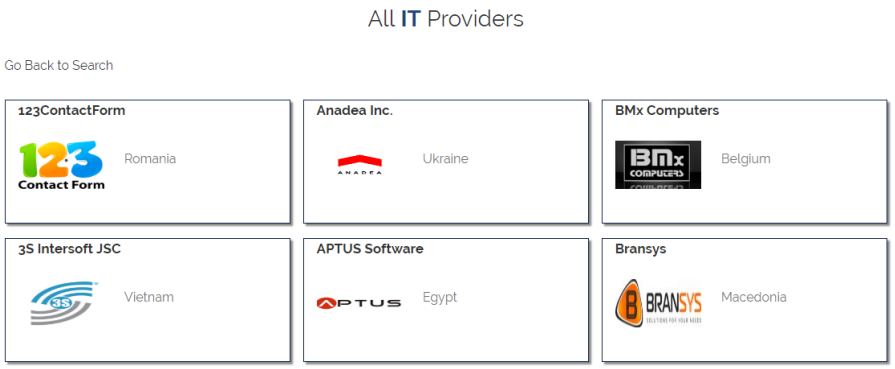
1. How does Industry 4.0 affect German companies?
2. Have you noticed any change on the German market with Industry 4.0 development?
3. Is outsourcing common practice in Germany? Why?
4. What are the main barriers preventing outsourcing for German companies?
5. What are the most important criteria when German companies choose international partner?

APPENDIX 3. The website of the IT Resources Directory

Search page



List of IT Providers



Single IT Provider Page

Flexmail Email Marketing Solutions

Contact:

Avenue des pléiades 11
Brussels 1200
Belgium
http://www.flexmail.eu

Contact Person:

Mrs. Jacqueline Mahieux
contact@flexmail.be
+32 2 669 20 20

IT Services:

Aggregation, Interface management of applications
Application development
Content generation, data collection
Database development, interfaces, queries
Training, user training
Webdesign, design UI

Company Profile:

Flexmail is a leading Belgian multilingual email marketing platform with extensive features that help you get the maximum impact in your contacts' inboxes. Every day we work on deepening existing features and developing new tools that simplify your marketing efforts. Our main focus lies therefore on ease of use and flexibility.

The Flexmail platform is one of the most easy-to-use tools on the market, and offers a full range of extensive features to our users, including AB Testing, marketing automation, easy email design, targeting features, extensive segmentation and reporting.

Methods:

Certificates:
Verisign
ISO 9001

Process knowledge, business sector served:
Flexmail users range from small businesses to international companies and are active in numerous sectors, including healthcare, industry, retail, travel, automotive, agencies, IT, entertainment, ...

Clients/Country:
Bayer / Belgium
Brother / Belgium
Kyocera / Belgium
Stihl / BelLux
Santander / Belgium
Geneva Tourism and Conventions / Switserland
Plan.net / Belgium
Jetair / Belgium

Potential cooperation forms:

Languages/Communication:

Next opportunity to meet us in Germany

Platforms/Languages/Tool: