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Master in Information Technologies & Innovation Management Program

**Instruments and methods of capturing knowledge
from customers: cases from electrotechnical and
software development industries**

Master's Thesis by the 2nd year student
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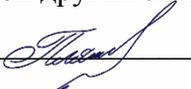
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

Я, Плясунов Никита Евгеньевич, студент второго курса магистратуры направления «Менеджмент», заявляю, что в моей магистерской диссертации на тему « Инструменты и методы получения знаний от клиентов: примеры из электротехнической отрасли и отрасли разработки программного обеспечения », представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

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АННОТАЦИЯ

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Описание цели, задач и основных результатов	Цель этого исследования состоит в определении того, как контекст влияет на выбор инструментов и методов получения знаний от клиента в компаниях из двух отраслей: электротехнической и разработки программного обеспечения. Помимо этого, целью также является и определение используемых инструментов и методов в компаниях. Для определения контекста использовался 4W framework (Where? Who? What? Why?). Данные были получены из серии интервью с представителями 3 компаний из электротехнической отрасли и 3 компаний из отрасли разработки программного обеспечения, а также с корпоративных сайтов и годовых отчетов компаний. В результате были определены инструменты, используемые в каждой отрасли, а также раскрыт контекст их использования. Более того, были замечены основные отличия данных отраслей по контексту использования инструментов и методов получения знаний от клиента.
Ключевые слова	Клиентские знания; Разработка нового продукта; Маркетинговые исследования; Получение знаний; Управление знаниями; Клиентоориентированность

ABSTRACT

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Master Thesis Title	Instruments and methods of capturing knowledge from customers: cases from electrotechnical and software development industries
Faculty	Graduate School of Management
Main field of study	Information Technologies & Innovation Management
Year	2016
Academic Advisor's Name	Dmitry V. Kudryavtsev
Description of the goal, tasks and main results	The goal of this research is to determine how the context influences the choice of instruments and methods of capturing knowledge from customers within companies from two industries. Another aim is identification of instruments and methods used by companies. For determination of the context, 4W context framework was used (Where? Who? What? Why?). Data was obtained from a series of interviews with representatives of three companies from the electrotechnical industry and 3 companies from the software development industry, as well as corporate websites and annual reports of companies. As for results, instruments and methods of capturing knowledge from customers were identified within both industries, and the context of their choice was disclosed. Moreover, the main differences between industries in terms of context of choosing instruments and methods of capturing knowledge from customers were identified.
Keywords	Customer knowledge; New product development; Market research; Knowledge capturing; Knowledge management; Customer orientation

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INTRODUCTION

Globalization, emerging countries and markets, the worldwide increase in number of firms, constantly changing environment lead to the fact that today companies are facing strong competition on the marketplace. In order to stay ahead, companies use plenty of methods, ways, generate ideas. Therefore, here the importance of marketing on the firm level arises. Kotler et al. (2011) said that marketing concept suggests fulfilling the needs and requirements of customers better than one`s competitors, and it is significant achieving organizational goals. Saad et al. (2015) stated that customer orientation of the firm is a key part of the marketing concept itself. What is more, they also noted that researchers argue that there was not clear difference between market orientation and customer orientation (Shapiro, 1988; Webster, 1988). Narver and Slater (1990) have presented market orientation as, "the organization culture that most effectively and efficiently creates the necessary behaviors for the creation of superior value for buyers and, thus, continuous superior performance for the business." In addition, they suggested market orientation to be an organizational culture that includes three behavioral components: a) customer orientation, b) competitor orientation, and, c) inter-functional coordination.

However, in this thesis, customer orientation was mostly focused on. According to Kohli and Jaworski (1990), customer orientation suggests different activities that are related to information generation, dissemination and corresponding responses to customer needs and preferences, both current and future ones. Hooley and Theoharakis (2008) also added that customer orientation assumes the degree to which the organization captures and uses information from customers, converts this information into a strategy for meeting customer needs, and implements that strategy by appropriately reacting to customer needs and wants and satisfying them.

Consequently, in order to react to customer needs and requirements to eventually satisfy them, it is important for organization to know what kind of information they should know from their customers, how to capture this information. Therefore, there is an intersection between two disciplines that are observed in this thesis: marketing and knowledge management. From knowledge management perspective, information that is known about customer needs and preferences is knowledge in general or customer knowledge in particular. Knowledge, as well as customer knowledge can be tacit (know how to do, but do not know how to explain) or implicit (can be codified and explained). Therefore, it means that in order to capture and use both types of knowledge, different methods of managing knowledge are used (Nonaka and Takeuchi, 1995).

Going closer to customer knowledge, researchers state that it is whether the knowledge that organization has about its customers or knowledge about organization, its products or services, that customers possess (Campbell, 2003; Mitussis et al., 2006; Lee et al., 2011). Other researchers stated that customer knowledge is a complex term and the definition itself depends on source of knowledge (Nejatian et al., 2011). Customer knowledge can be classified as following: knowledge about customers; knowledge from customers; knowledge for customers (Gebert et al., 2002; Bueren et al., 2005; Feng and Tian, 2005). Every type of customer knowledge deserves its description; however, the author decided to focus on knowledge from customers as a key focus of this thesis. What is interesting, customers can contribute to the organizations' understanding of current and future products or services, strengths and weaknesses, etc. (Wayland and Cole, 1997; Zack, 2003; Paquette, 2006). Due to relations with organizations, customers have their opinions, thoughts, ideas, satisfied or non-satisfied needs, and they may share this knowledge with the organization. This knowledge can be used within organization for different purposes, chief among them are quality improvements of products or services, new product development (NPD), market or customer research and other purposes that depend on individual organization (Paquette, 2006; Laage-Hellman et al., 2014).

Harlow (2008) in his research of 108 Fortune 500 companies stated that companies with developed knowledge management approaches and instruments have higher effectiveness of innovation activities. It means that using knowledge management instruments allows company to be more successful with new product development.

As for marketing perspective, capturing of the information or knowledge from customers is traditionally viewed as a part of market research or in particular, in customer research. For doing this, organizations use different instruments and methods. In this thesis, the author considers different instruments and methods, classify them between general instruments and methods of capturing knowledge and specialized ones. General methods and instruments of capturing knowledge from customers are mostly mentioned in knowledge management literature and toolboxes, such as Asian Productivity Organization knowledge management tools and techniques manual (2010) and UNICEF knowledge exchange toolbox (2015); and specialized instruments of capturing knowledge from customers, that are mostly used within marketing for market and customer research. Some of the specialized instruments are used online, so the connection to digital marketing takes place in this research.

The usage of mentioned instruments apart is good, however, the importance of the context should be considered. By context the author assumes conditions, under what the usage of instruments is occurring. The framework used for considering the context is 4W by Sergeeva,

Andreeva (2014), originally brought by Johns (2006). The framework was initially used for explaining knowledge sharing inside organizations but also can be implemented for this research. Each “W” (What?; Where?; Why?; Who?) represents the dimension of context.

The final point in identifying the context of usage of instruments and methods of capturing knowledge from customers is the object of research: what are the studied companies. The author decided to choose companies from two industries: electrotechnical and software development. Both industries are characterized by high intensity of knowledge that is coming from customers and used for product or service development.

Research Structure

In the theoretical part of the work, the author introduces the concept of knowledge itself and customer knowledge. The ways in which customer knowledge and customer value are connected are discussed as well. Next, the author discusses major works on this topic and the different approaches to classification and definition of customer knowledge. After understanding what is customer knowledge is, the author shifts to the instruments and methods for capturing knowledge from customers that are used in market and customer research, in knowledge management, etc. The classification of instruments and methods is created based on the literature review. Finally, the author states that not only instruments are important, but also the conditions or context, where these instruments can be used. For the research part, the author chooses two industries for the comparison of used instruments and methods and the context inside.

In methodological part, the explanation what companies were chosen for the analysis is provided, how the framework may clarify the usage of instruments within the companies. The author then outlines the research process and methods for data gathering. At the end, the author explains the way of data analysis.

In the research findings and discussion part, the results of the research are presented, analyzed and discussed according to the research gaps identified in theoretical part. First, the author identified what instruments and methods are used in all the companies he contacted with. Second, he showed how the context influences the choice of instruments within two different industries; therefore, the difference between the industries in terms of 4W context is also described. The last stage is the identification of the research’s limitations, implications and recommendations for future research.

Research Goal And Research Questions

The main goal of the research is to identify what methods and instruments are used for capturing knowledge from customers in electrotechnical and software developments industries

among companies working in Russia. As well as to identify the 4W context of the choice of instruments and methods between two industries (aims and targets of knowledge capturing, types and representations of knowledge capturing, what is the company that captures knowledge and who are the customers). According to the literature review that is presented below, there is a significant number of research papers connected with customer knowledge management, but in superficial coverage of topic. Topic of knowledge from customer is developed but in fuzzy and multidisciplinary style, there is a lack of precise literature on concrete tools used for creating and capturing knowledge from customers. That is why the purpose of the research was to identify methods and instruments that are used for capturing knowledge from customers. Moreover, there is a lack of research on Russian practices on this topic. Probably because companies that work in Russia do not attach sufficient importance to knowledge management. Alternatively, there is a probability that companies could use instruments for managing customer knowledge, but they consider them as marketing tools or other tools, avoiding “knowledge” term (things could be called not by their proper names). Perhaps this is due to the widespread notion that this subject is relevant only for big companies and for high-tech industries. However, in the research the author ascertained that this fact is not always correct.

As for the research questions, they are the following:

- What methods and instruments do companies from electrotechnical and software development industries use for capturing knowledge from customers?
- How context influences the choice of instruments and methods among these industries?

Research Methodology

Current approach to research is based on both primary and secondary data, with a strong focus on primary data. In order to obtain the data and answer the questions stated above, the author conducted semi-structured interviews with experts and specialists within marketing and client relation or project managers field from companies that work in Russia in electrotechnical and software development industries. The precise and concrete measures were undertaken as well as the methodology, used framework and plan of empirical study will be viewed in the second chapter.

Research Results

The research results rely on the analysis of six companies from both electrotechnical (3) and software development (3) industries. The author described the practices of the companies in capturing knowledge from customers. What is more, the context of usage instruments and methods of capturing knowledge from customer for each industry was described by using the 4W

framework. In the end, the comparison between two industries was revealed and presented in a form of decision tree.

Research Limitations

As for the limitations of current research, first, the broader sample could be better for understanding the industry specifics more precisely. Second, since the primary data was extracted from different specialists, that have different positions within the companies, they could answer author's questions from their point of view, their projects, and activities.

CHAPTER 1. THEORETICAL BACKGROUND OF THE STUDY

1.1 What is knowledge?

The first thing to consider and at the same time a starting point of the literature review is knowledge itself and how it can be classified.

In the modern reality, the majority of resources are not truly specific: capital, machinery, or tangibles can't be used for distinguishing different businesses from each other. Now only using of specific knowledge in business can distinguish them and give business a real competitive advantages. Peter Drucker noticed this importance of knowledge in 1999 and this statement is still actual. E.Geisler and N.Wickramasinghe (2009) also noticed that knowledge is more relevant to sustained business than capital, labor or land. Therefore, that is why more and more organizations strive to implement knowledge management techniques within the organization.

«Knowledge» is not actually new term. It is widely used in education, science and in all spheres of human activity. The author thinks that everyone understands the meaning of this word in the almost same way. The term «Knowledge» is closely connected with term «Information» and with term «Data». It may seem that these terms are the almost similar, but the impression is deceptive. According to R.Ackoff (1989), who suggested the following hierarchy of content of human mind (Data – Information – Knowledge – Understanding – Wisdom); it is possible to define each aspect of his hierarchy.

- Data – is some disordered characters, symbols which can be viewed without respect to any context
- Information – is data that is processed to be useful; It provides answers to "who", "what", "where", and "when" questions
- Knowledge – is identified trends or significant relationships between facts presented in the information; Answers "how" questions
- Understanding – is the awareness of consistent patterns, contained in scattered knowledge; Answers "why" questions
- Wisdom – is weighted, estimated understanding of the consistent pattern from the past and future points of view

Each of these concepts is the foundation for further one, or material for a new, higher quality element of knowledge. What is more, according to R.Ackof (1989), first four concepts are dealing with the past or with what is already known, and "wisdom" is connected with the future. Of course, there are many definitions of Knowledge from different sides and points of view, but in this thesis, the author is interested only in what is knowledge that can be used within the organizations for their effective operations and reaching goals. European Guide to good Practice in Knowledge Management (2002) states that knowledge is a combination of data and information, with added opinion of the expert skill and experience, which results in a valuable asset that can be used to support decision-making process. It is very important for organization, because every strategy, every aim of the organization is based on decisions and decisions should be based on something, which includes past experience, skills and information about business and clients. That is why knowledge is important within organizations.

What is more, it is important for the organization to classify knowledge available within the organization. The significance of knowledge classification consists in usage of knowledge for different purposes; therefore, not all types of knowledge would match all purposes of using.

One of the most popular classification of knowledge is division between tacit and explicit knowledge. Helie and Sun (2010) characterized explicit knowledge as "knowledge that can be readily articulated, codified, accessed and verbalized"¹. In other words, it can be the description of the theories, methods, techniques, technologies, machines and mechanisms, structures, systems, etc. Explicit knowledge is stored in the actual physical media (books, paper documents, drawings, diagrams, movies, databases, etc. It means that this type of knowledge is storage and it is easier to process and use this knowledge.

As for tacit knowledge, Polanyi (1966) firstly introduced this term and it is type of knowledge, opposed to explicit. It is personal knowledge, inseparable from individual experience. It can be transmitted by direct contact - "face to face" or using special procedures of knowledge extraction. According to Nonaka and Toyama (2003), the tacit practical knowledge is the key for decision-making process and management purposes. For example, we cannot simply gain the skills of senior software developer or CEO only based on books or learned in class. People can do it only through years of experience and involvement. And when person has that type of knowledge, he or she can make a decision, based on experience and embodied knowledge (or know-how).

¹Helie,S; Sun, R. (2010). "Incubation, Insight, and Creative Problem Solving: A Unified Theory and a Connectionist Model". *Psychology Review* 117 (3): 994–1024

Nonaka and Takeuchi (1995) also offered a model that represents a continuous transformation and exchange between tacit and explicit knowledge. Conversion of knowledge within the same form or in the transitions between the forms is a result of the following processes:

- Socialization – from tacit to tacit. Forming and transfer of tacit knowledge. It can be expressed in forms of discussions, seminars or teamwork. Usually, this does not create extra tacit knowledge among participants
- Externalization – from tacit to explicit. Can be expressed in the form of summary or resume of brainstorm, seminars and discussions when conceptualization, extraction, elicitation and fixation of tacit knowledge to explicit takes place
- Combination – from explicit to explicit. It is executed during the integration of different sources of information, e.g. preparing reviews or summary reports. The increase of explicit knowledge takes place here due to replenishing databases and repositories of collective use, classification and systematization of files and documents, etc.
- Internalization – from explicit to tacit. On this step, explicit knowledge is created using tacit knowledge and is shared across the organization. While reading or being practiced by individuals, this tacit knowledge then makes the learning spiral of knowledge creation wider. Organizations may launch training programs for its employees of different experience or skills. By analyzing and assimilation of training manuals and documents employees internalize the tacit knowledge and try to create new knowledge after the internalization process.

The using of this SECI model is the important part of knowledge creation. The cyclic nature of the model allows organization to constantly create new knowledge from business experience, educational programs, reports creation, etc. Therefore, to maximize the effect of using this model, organizations should use it agreed with all employees and applied to key, or core knowledge.

To sum it up, knowledge is the key resource of creating and maintenance of competitive advantage in modern economy. Even in industries based on the importance of land and capital, those who knows more and earlier than another does, how to use these resources correctly will have an advantage. Moreover, many relatively new industries completely based on knowledge creation and knowledge usage. Thus, namely people and knowledge, that they possess, know-how, abilities to innovate, trust relationships with clients and partners and other intangible assets

are becoming the most important source of organizations' development. (Geisler, Wickramasinghe, 2009) These intangible assets are often called intellectual capital; and the ability to manage an intellectual capital is now one of the key competencies in the modern economy.

1.2. Customer knowledge and its typology

Earlier, the concept of knowledge and its importance were highlighted. Concerning the topic of author's thesis, that is strongly connected with the customer knowledge in general, and knowledge from customers in particular, which is more specific and should be analyzed. Nevertheless, before switching to customer knowledge, the importance of value for customer should be described.

The importance of value

Now we are living in a world where the customer is highly demanding and one of the crucial aims of the company is to satisfy its' customer needs. However, the one who knows how to satisfy the customer in a best way is the customer itself. According to the life experience and common sense, the person acting as a customer can mostly identify his needs himself and sometimes even has an idea how to organize it in a best way.

Anderson et al. (2008) emphasize that if the organization has an aim to meet and satisfy its customer needs, the value proposed in the organization's market offerings should be the cornerstone of its strategy. Value here is defined as the "expression in monetary terms of the economic, technical, service and social benefits a customer firms receives in exchange for the price it pays for a market offering" (Anderson et al., 2008). Yet in 1985, Michael Porter expressed his famous position of customer value: if the organization is able to create a value for its customers, than the organization has competitive advantages (Porter, 1985). According to Slater (1997), organizations acknowledge the importance of maximizing the value they intend to provide through two different perspectives: its internal management and its external orientation. However, over the last years, there was a shift in organizations' orientation. Internally, the role of knowledge inside organizations has become central, and externally the customer has been attracting most of the attention among business managers and academia (Plougastel, Bertin, 2011). Nevertheless, the customer's perception of the value of an offering can vary from the perception of the organization (Woodruff, 1997). His precise definition was the following: "customer value is a customer's perceived preference for and evaluation of those products attributes, attribute performances, and consequences arising from use that facilitated achieving the customer's goals and purposes in use situations» (Woodruff, 1997).

Therefore, it is important to take a value concept to consideration. That is why, identifying and understanding customer's perception of value is crucial for customer's satisfaction. In addition, if in the majority of cases the customer understands his needs, identification of his perception of the value or knowledge about needed product, service, etc. will bring the organization an advantage, because it will know ways of satisfying the customer (based

on his needs, knowledge of products or services he/ she used). In addition, all the organization needs later is to analyze and implement this knowledge to its business. The key point here is that in order to add value, organizations should understand how the customer perceives the value (what is current value, what can bring additional value), and capture this customer “knowledge” through different methods.

Conceptualizing, providing, delivering value are also important processes for organization, however the author is not going to consider them precisely in his thesis in order not to extend the field of research, and further will focus on customer knowledge.

Introduction to customer knowledge

The customer value for the company can be measured, among others, in terms of customer satisfaction and competitive edge. Creating customer satisfaction requires a shift from market to customer orientation, which means increasing the focus on the customer (Ernst et al., 2010; Lukas et al., 2013).

Focusing on the customers includes better satisfying his needs, paying more attention to feedback, importance of customer opinion. (Martin, 2010). Therefore, the organization needs both to build relationships with customers and explore their needs in order to provide value to their customers and then capture value from customers in return (Sedighi et al., 2012). In order to provide value, the organization should know what their customers need, want and expect. Here, the organization needs knowledge of customers or customer knowledge. Therefore, the importance of customer knowledge takes place.

Definition

Customer knowledge reflects the way in which the company understands its current and future customers’ needs and preferences (Lee et al., 2011). Feng and Tian (2005), based on Gebert et al. (2002) define customer knowledge as: “the dynamic combination of experience, value and insight information which is needed, created and absorbed during the process of transaction and exchange between the customers and enterprise”. Campbell (2003) defines customer knowledge as: “organized and structured information about the customer as a result of systematic processing”. According to Mitussis et al. (2006), customer knowledge can be defined as a complex type of knowledge, because customer knowledge can be acquired from different sources and channels (Nejatian et al., 2011). Companies usually capture customer knowledge by creating interactions and dialogues with customers, by observing how customers use products or experience service, as well as by analyzing corporate data and information in order to forecast customer behavior (Wayland and Cole, 1997). Customers accumulate the knowledge about

products or services they have and use, and they actually may contribute it to company's learning process (Zack, 2003). According to Paquette (2006), customers can provide unique knowledge for the organization that allows it to learn and acquire knowledge to improve its internal operations, including innovation and new product development. From another side, the organization provides to the customer knowledge of its products and services, which makes customer more informed about company, and therefore, the customer can become loyal to the company. This two-way flow of knowledge allows company to create a competitive advantage based on relationships, or probably, partnership with customer.

Concluding these definitions and statements placed above, customer knowledge can be both

- Structured information, facts, knowledge that company has about its customers and their needs, preferences
- Knowledge that customer possess in form of experience, value and insight information. In this case, the knowledge is not codified, it "stores" in the heads of customers, so it can be identified as tacit knowledge. It means that it is difficult to acquire this type of knowledge, because it deals with state of mind of the customers, however, it is important to perceive this type of knowledge due to potential source of insights and ideas (Crié and Micheaux (2006).

Classification

Customer knowledge can be classified in several ways. Gebert et al. (2002) created the classic classification of customer knowledge. They classified it from the organizations perspective into three types: knowledge for customers, knowledge from customer and knowledge about customer. Bueren et al. (2005), Feng and Tian (2005) in their papers classified customer knowledge in the similar way. Some researchers, e.g. Crié and Micheaux (2006) divide customer knowledge into two types, namely: "Behavioral", that can be easily captured and basically quantitative by nature (transactional data), and "Attitudinal", that can hardly be captured, but it suggests customer ideas and insights. However, Gebert's classification (2002) is more common, so the author used it further. So, three types of customer knowledge, according to Tseng, Wu (2014), based on Gebert (2002):

- Knowledge FOR customer: knowledge, provided to customers to satisfy their needs
- Knowledge FROM customer: knowledge that customers possess that organizations can obtain by interacting with them
- Knowledge ABOUT customers: knowledge about customers to optimize customer profiling and segmentation, and campaign management processes

For this master thesis, the author will focus on the third type of customer knowledge, knowledge from customers as it seems interesting and promising topic to explore. What is more, the author found out that knowledge for customers and about customers are being highlighted more in academy research and it became interesting to explore something new within the topic of knowledge from customer. Here and in the following parts of the thesis knowledge from customers means the knowledge that customers possess, not knowledge company has on its customers.

Knowledge FROM customer

As we already identified the classification of customer knowledge types, now it is important to shift to the knowledge from customer. Wang and Yu (2010) stated that knowledge from customers refers to the feedback of company, its products and services, competitiveness, that can be acquired from customer. Due to the development of technologies, now the amount of information that is available to customers has increased undoubtedly and consumers now can easily develop their own opinions regarding company, its products or services (Tseng and Wu, 2014). What is more, customers are paying more attention to the quality of the products and services they are consuming, rather than the price (still, the price is also important), and this statement is especially truthful for non-consumable goods (Garcia-Murillo and Annabi, 2002).

According to Fang and Tsai (2005), the companies should consider customer expectations, because it would provide satisfying service and to develop service quality. Mithas et al. (2005) also stated that through communication and interaction with customers, the company can gain customer knowledge related to new demands about products or services that can be helpful references for improvement; moreover, this process is beneficial to customer satisfaction, customer loyalty and employee productivity. Therefore, the purposes of capturing knowledge from customers are quite various, starting from new product development and quality of products, services enhancements to conducting complex market researches in order to understand trends, customer needs and wishes, or any others depending on the company and its goals.

In addition, the following forms or representations can be considered as knowledge from customers:

- Opinions
- Feedback

- Insights
- Requirements
- Ideas

According to researchers, the object of knowledge from customers, or what exactly customers may know about organization, also can vary due to the extensive customer knowledge (Gebert et al., 2002; Paquette, 2006; Laage-Hellman et al., 2014; Muravskii et al., 2013):

- Knowledge about products
- Knowledge about services
- Knowledge about brand
- Knowledge about business processes
- Knowledge about market
- Knowledge about partners
- Etc...

The following Mind map finalizes the part of features of knowledge from customers.

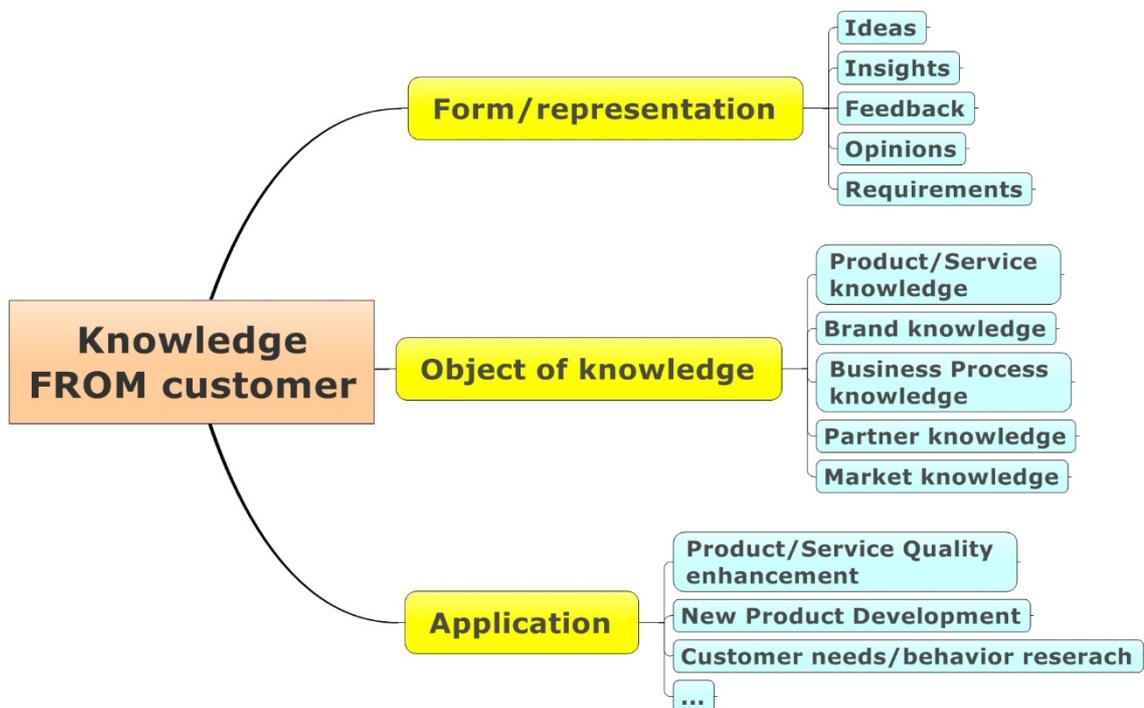


Figure 1. Knowledge from customer features mind map. Source: adopted from Mithas et al., (2005); Paquette, (2006); Wang and Yu, (2010); Muravskii et al., (2013); Laage-Hellman et al., (2014);

This classification was used as a helpful scheme for gathering primary data during semi-structured interviews for applying the gathered data to 4W framework, where the author collated the usage of instruments or methods of capturing knowledge from customers and the context behind the choice of the instruments between two industries. Now, shifting from knowledge from customers to instruments and methods that are used for capturing this type of knowledge takes place.

1.3. Classification of instruments and methods of capturing knowledge from customers

In this part, the author has created a classification of instruments and methods that can be used for capturing knowledge from customers. What is more, the brief review of instruments and methods was made, and the most popular best practice cases were mentioned for some instruments. The classification that is provided in this section is general one; however, the author tried to include both well-known and less known instruments and methods in order to make it as complete as possible. Important to mention, that classification does not provide all of possible versions or variants of instruments, instead the author tried to generalize them. Because it was problematically for the author to find a ready set of all instruments and methods, he has created the classification based on different sources. As for the way of creation of the classification, the author have created it using the following things as a sources of classification`s content:

- Brainstorming sessions with author`s academic advisor, his valuable advices;
- Interview with two experts in the field of knowledge management and strategic consulting;
- Literature sources and scientific papers;
- Author`s knowledge extracted from GSOM SPBU courses;

That is why the classification focuses not only on knowledge management instruments and methods but also on any specialized instruments and method that could be used for capturing knowledge from customers. As it was previously mentioned in the introduction, this research lies between two major disciplines: marketing (because many instruments of capturing knowledge from customers are elements of market and customer research) and knowledge management (because the author describes customer knowledge and instruments from knowledge management were mentioned too). Consequently, in order to classify instruments and methods, the author divided them into two groups: general instruments and methods of knowledge management and specialized ones. It was the first level of classification. Information about general knowledge management instruments was mostly extracted from special guides of unified knowledge management instruments. While information about specialized instruments was received with the help of discussions and interviews mostly and then among the literature sources. The second level of classification is the division between online and offline methods and tools. Only two levels of classification may look narrow, however author`s attempts to make it broader have not succeed due to levels where there were no instruments at all. Therefore, the decision about more simple classification was done.

As it was mentioned before, in marketing field, marketers use different instruments in order to explore their customers, clients. In order to do this, they conduct market research. Market research means the systematic collection, analysis and interpretation of information gathered from the market or its elements that is relevant to marketing decisions (Hague et al., 2013). As for the application of market research, the most common ones are assessing customer satisfaction and loyalty, measuring the effectiveness of promotions, identifying the market size and shares, competitor analysis, measuring use and attitudes to products or services, determination of optimal pricing strategies and brand influence, and determining effective segmentation strategies (Hague et al., 2013).

Using them, they could receive different type of information that can be transferred to knowledge. This information can be connected with customer characteristics, preferences, features, etc. In terms of knowledge management, marketers at the end receive knowledge, that can be classified into three types, that we already familiar with: knowledge from, about, for customer. Authors of books about market and customer research highlight instruments and methods that allow obtaining customer information. However, in this research the author focus on information or knowledge that is coming from customer. Nevertheless, in some cases it is hard enough to identify, whether it is information/knowledge from or about customer. In the classification mentioned above, the author tried to separate these two types of information/knowledge and focus mostly on knowledge from customer.

As for the literature sources, where instruments and methods of capturing knowledge from customers are presented, some of the sources were analyzed. Hague et al., (2013) in their book *Market Research in Practice: How to Get Greater Insight from Your Market*. Authors mostly focus on the customer research methods, considering methods that are more traditional. What is more, authors divide market research methods between consumer and b2b market research methods: however, the methods can be the same, but the specifics of markets is different (significant number of potential customers in b2c and smaller number in b2b, but they can be different in size and specifics of business), and the choice of the research method strongly depends on the concrete company. Once again, the authors highlight rather basic, but widely used instruments and methods of market research, such as questionnaires, focus groups, surveys, interviews, ethnography.

While Poynter (2010) in his book *The Handbook of Online and Social Media Research: Tools and Techniques for Market Researchers* highlight the importance of Internet and social networks within market research due to web technologies rapid spread. He stated that now market research conducted via Internet is growing and it is perspective field to investigate. As for

highlighted instruments, Poynter pointed out web surveys, online focus groups, sentiment analysis, blogs, netnography, communities in social networks as main methods and instruments of online market research. Gault et al., (2015) in their article presented a list of instruments that are suitable for market research for collecting insights from customers. They apply their research to product design that need knowledge from customers for new product development and improving the existence products and their quality. In addition, many other authors were considered, and they highlighted different instruments and methods of capturing knowledge from customers. Calder (1977); Kamberelis, Dimitriadis (2013) considered the usage of focus groups. Gouling (2004), Kozinets (2010, 2012) highlighted ethnography and netnography usage for customer insights identification, Kaulio (1998) demonstrated beta tests in new product development of software and hardware development, etc. All other researchers are mentioned in the next part of this thesis, where the author highlighted instruments and methods separately with descriptions of each.

The classification below (Figure 2) illustrates the division of all instruments and methods identified by the author. The classification may be incomplete, because it was created before conducting interviews with representatives of companies, and because it is almost impossible to cover all sources of literature.

The next step is a review of all instruments and methods included in the following classification.

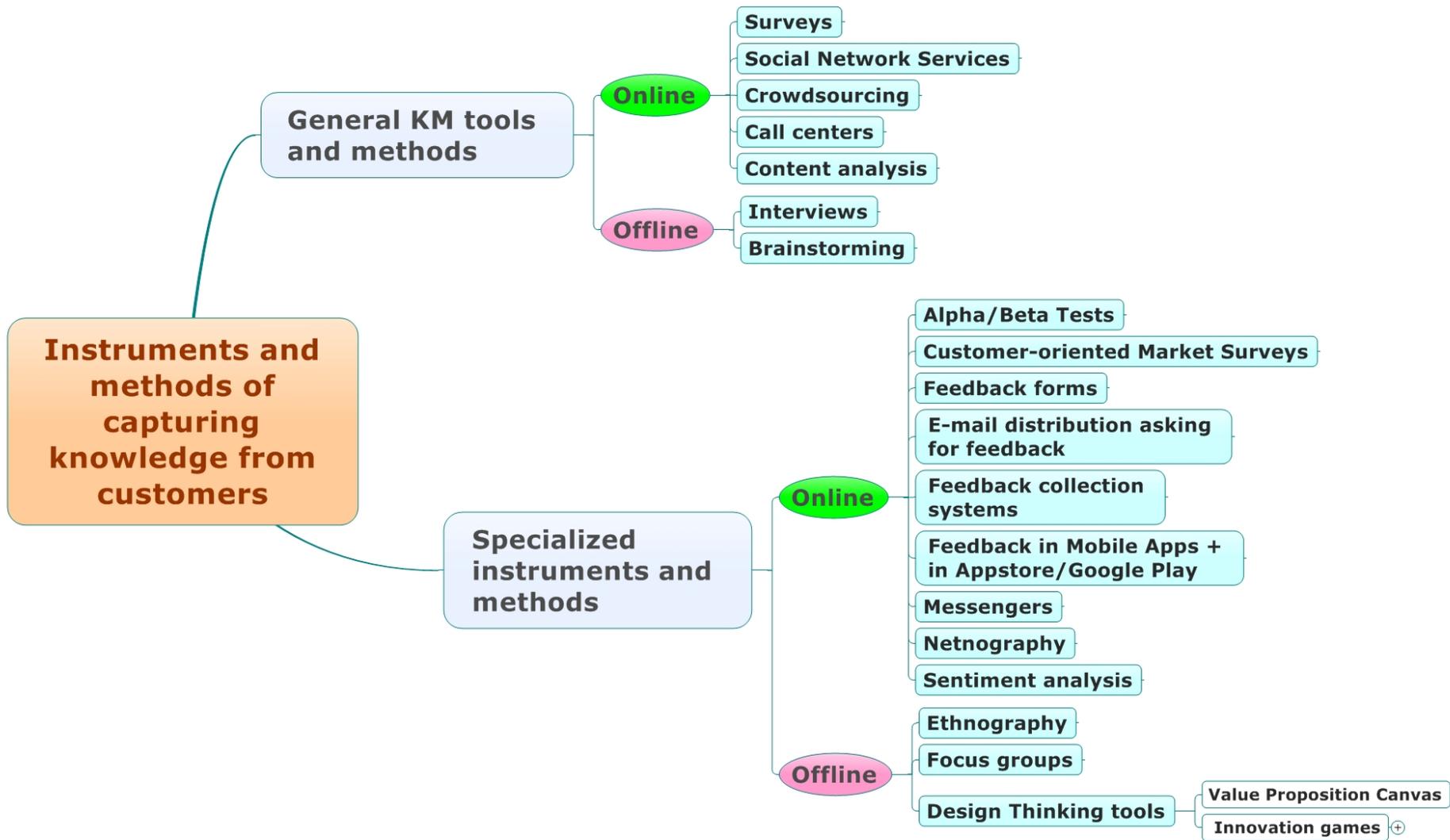


Figure 2. Instruments and methods of capturing knowledge from customers. Source: created by the author

1.3.1. General instruments and methods of capturing knowledge from customers

First, the author considered general instruments and tools of knowledge management that are used for capturing knowledge from customers.

Specific international organizations that cope with knowledge management and its usage and implementation have their own classifications or just sets of tools or instruments that can be used in managing knowledge. The example of such organizations is UNICEF and its' Knowledge Exchange Toolbox (2015) where group methods of knowledge sharing, discovery and co – creation are presented. Another one is APO (Asian Performance Organization) with its' Knowledge Management Tools and Techniques Manual (2010). Both documents illustrate different knowledge management tools that exist within organizations. Each tool is provided with short description of the ways it can be used or implemented. However, as in APO's document stated, "key objective for the Asian Productivity Organization (APO) has been to develop a training manual on knowledge management Tools and Techniques that will give in-depth knowledge in order to assist the National Productivity Organizations (NPO) trainers to make the leap and become "KM Consultants"" (APO,2010). Nevertheless, these manuals also might provide valuable advice and assistance to small and medium-sized enterprises who might find something interesting and useful in the field of knowledge management tools from the point of implementation.

As the author is interested in capturing knowledge from customers in this master thesis, and manuals mentioned above do not include specialized tools for that purposes, but general knowledge management tools (some of them of course are applicable for capturing knowledge from customers), he needed to substantiate the choice of appropriate instruments from these manuals to be considered in his thesis. The author decided to choose UNICEF's and APO's manuals as basis because they provide proved and unified instruments and methods of knowledge management.

According to UNICEF's knowledge exchange toolbox and APO manual as well, managing of knowledge includes several stages and each stage supposes its own instruments and methods:

- Identifying the knowledge
- Creating knowledge
- Storing knowledge
- Sharing knowledge
- Applying knowledge

Talking about all these stages of managing knowledge, it takes the researcher too much time to consider all methods and tools. Consequently, considering methods of capturing knowledge from customers as a key focus of this thesis, the author assumes that some instruments that belong to creation of knowledge stage may be appropriate ones for managing customer knowledge. However, all instruments from all stages that suggest capturing knowledge from customers were analyzed and appropriate ones were included into classification.

1.4.1 Surveys

According to UNICEF Knowledge exchange toolbox (2015), surveys are divided between formal and informal surveys. “The formal surveys include any with beneficiaries as respondents, any surveys for the purpose of research, for collection of statistically representative data (for example, on the situation of beneficiaries), for any kind of publication, or as part of formal evaluations” (UNICEF, 2015).

However, the informal survey can play a role of a primary source of information that allows understanding the needs, opinions and experiences of employees or partners; identifying and analyzing their views and opinions about initiatives or project that take place within the company; and informing future plans (UNICEF, 2015).

Here, if we are talking about capturing knowledge from customers, both formal and informal surveys can take place. According to Bryman and Bell (2003), surveys are divided between questionnaires and interviews. In this part, by survey the author mostly means questionnaire as he has interview as an instrument further in the classification.

Typically, a questionnaire is a paper-and-pencil instrument that is administered to the respondents. The usual questions found in questionnaires are closed-ended questions, which are followed by response options. However, there are questionnaires that ask open-ended questions to explore the answers of the respondents.

Questionnaires are quite popular among researchers and companies as an instrument of receiving feedback and even insights (Bryman and Bell, 2003). Questionnaires are included in different survey methods, according to how they are given. These methods are classified as the self-administered, the group-administered, and the household drop-off (Trochim, 2006). The self-administered survey method is commonly used by researchers in modern research and business (Sincero, 2012). Today, due to spread of Internet and special online tools for surveys (Survey Monkey, Google Forms, etc.); most of them are conducted online.

The results of a survey are interpreted, and the feedback and insights are being formulated and analyzed in order to satisfy the target of a survey (that depends on what the company likes to receive).

1.4.2 Social Network Services

Social network services (SNS) are social media services that allow its users to create, modify and present their profiles within a bounded system, and show lists of other users with whom they share connections (Ellison et al., 2007). Using these services, users can establish and maintain connections with others who have similar interests (Gunawardena et al., 2009). Several actions that users can perform through SNS are posting comments, receiving comments from others, joining groups and fan pages, creating events, using customized applications and playing games (Chua, Banerjee, 2013). All these well-known social networks, such Facebook, MySpace, Vkontakte, and Instagram are widely used by customers. Companies have their communities, accounts, profiles within social networks. “And if customers like products or services of the company, they will talk about them, and if they don't, they will probably shout about them” (Young, 2010). Using social networks as instrument of capturing knowledge from customers allows receiving feedback, negative comments, positive reviews, or some ideas and offers (Chua, Banerjee, 2013).

What is more, social network services allow organizations to create knowledge from customers by seeking customer-driven innovation that can be used in design or products (Sigala, 2012); capture customer knowledge by reviewing how customers react on changes in products, services, how the like or do not like the brand and the company itself (Magnier-Watanabe et al., 2010). In addition, there are special portals that companies create for their partners and clients especially in b2b and encourage them to express their needs, knowledge about the market itself, doubts, etc. (Maswera et al., 2010).

As for a case, Starbucks, international coffee house chain, used SNS in order to capture knowledge from customers: Twitter for posting new recipes and gathering feedback and ideas how to improve them; Facebook to directly ask customers what versions of coffee are better, and other opinions, preferences and feedback. All of these actions were done in order to ward off the competition from huge dominant players of food and beverage industry (McDonalds, Dunkin`'s Donuts). As a result, the number of tweets, mentions and positive comments increased enormously (Chua, Banerjee, 2013).

1.4.3 Crowdsourcing

According to Jeff Howe, who has created the primary definition of crowdsourcing: “Crowdsourcing is the act of (a company or institution) taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call” (Trompette et al., 2008). However, crowdsourcing is all about Open Innovation concept, where knowledge is being invented by collective creativity undertaken within an open community of peers and this creativity is conducted online with the help of collaborative Internet tools (Chesbrough, Appleyard, 2007; Trompette et al., 2008). The important thing here is that crowdsourcing is a wide term and can be seen from different perspectives:

- Companies could use crowdsourcing in order to co-create innovation, collect ideas and information (Aitamurto, 2011)
- Crowdsourcing in “innovation intermediaries”, that firstly were highlighted by Chesbrough (2006); they can be defined as marketplaces where knowledge seekers meet solvers who are able to provide seekers with knowledge, ideas and solutions for seekers’ specific problems. Examples are companies such Innocentive, NineSigma, YourEncore

However, in order to capture knowledge from customers, companies now actively use crowdsourcing mostly for collect ideas, opinions or offers for new products, their features, or how to improve something within the company (Drogosch ,Stanke,2015). The example of MySturbucks idea by Starbucks, where the company launched a crowdsourcing company in order to collect different ideas from customers in order to develop new tastes of coffee and receive feedback. Some ideas came from customers that have been adopted by Starbucks include the implementation of “Starbucks Card eGifts” system and “Mocha Coconut and Coconut Crème Frappuccino beverages” (Chua, Banerjee, 2013). Another example is Lego Ideas, the service launched by Lego, toys company: customers are supposed to create a model, take a picture of it and with a short description submit it on Lego Ideas’ portal, where other users vote for the best variant. A bit later, the best variant received the most number of likes is being processed by internal R&D and launching phase starts. The idea contributor is not only proud of himself, but also receives a part of revenue and is mentioned as an author of a new Lego constructor set (Ideas.Lego.com, 2016).

1.4.4 Call centers

Call centers or contact centers are also instruments of knowledge management that can be used in a different ways. However, in terms of capturing knowledge from customers, contact centers imply two main functions:

- The customer is calling contact center in order to solve his problem; as the current contact center belongs to the concrete company, it means that customer has a question, feedback, idea or opinion on the company itself, the product or service and consequently provides the company with this type of knowledge. It allows company to identify what is wrong and what can be changed or developed;
- Another application is when the company collects all the incoming flows of knowledge coming from customer in order to create a database or set of frequently asked questions in order to make the process of satisfying calling customers faster and allow answering similar questions and solving similar problems in unified way (eGain, 2015);

The good example of using call-centers as an instrument of capturing knowledge from customers is Nespresso company, a premium coffee brand. As a brand of Nestle, they wanted to identify intents to buy a product, key concerns about it. And one of the channels for capturing insights from customers was call-center, where the company learned about market trends, and concerns, e.g. concerns about the carbon footprint of the coffee capsules (Anderson, 2012).

1.4.5 Content analysis

Content analysis is a quite big topic; however, in this part the author is interested in content analysis as a part of knowledge elicitation technic. According to Hodder (1994), content analysis is also represented in methods for studying and extraction meaningful information from documents. Content analysis is also applicable when knowledge is being extracted from survey results of interview results (Agarwal, Tanniru, 1991). Talking about customers and knowledge that coming from them, content analysis can be applicable as a tool when in b2b customers provide the company with official documentation with requirements or cooperation details and the company extracts knowledge that customers in b2b possess. The extracted knowledge in a form/ representation of official requirements or insights extracted from survey results can be used by the company for plenty of aims such as new product development or strategic planning.

1.4.6 Interviews

The interview is a data collection technique, where the interviewer asks a number of questions prepared in advance in order to receive a better understanding of a specific knowledge area (Rollnick et al., 2007; Hashem, 2008). Interviews are widely used in different spheres and areas, such as sociology, medicine, marketing, journalism. There are different types of interviews depending on the structure or its absence (structured, unstructured, semi-structured). It allows the interviewer to choose the tactics of interview depending on the final aim. Interview is a quite popular technique for collecting thoughts, opinions, feedback because of its apparent simplicity

of conducting (Gavrilova, Andreeva, 2012). However, researchers say that conducting interviews is not simply task for non-experienced people and the ability to conduct interviews comes with experience and depends on professionalism and soft skills of an interviewer (InfoWave, 2012). Due to their character, interviews are generally aimed at elicitation of explicit knowledge from individuals (Gavrilova, Andreeva, 2012). What is more, one class of interviews that is used for capturing knowledge from customers in business is called depth interview. Actually, it is a semi-structured interview, where the interviewer initiates the process asking several prepared questions on major topics and tries to expand the talk according to the situation. The aim of the depth interview is to capture depth, overall understanding on interviewee`s behavior, attitude to product, company, market, etc., or capturing his ideas, insights that can be used for new product development, or understanding the preliminary reaction on new marketing campaign (InfoWave, 2012).

1.4.7 Brainstorming

This method for generating ideas is a classic method and many companies use it on a frequent basis. Alex Osborn created this method in 1948, when he first implemented this tool in order to check the creativity of group of people to make creative ad campaigns (Lehrer, 2012). Brainstorming is a quite simple way to generate novel ideas for problem solving and innovations (UNICEF, 2015). As the name of the method itself suggests, Brainstorming is designed to stimulate the brain thinking activities to think in a new way. It encourages people to switch from conventional, logical thinking to creative thinking, embrace originality and imagination (UNICEF, 2015). The key features of a brainstorming methods are the following:

- Single specific problem or question is given
- Participants express their suggestions, ideas, opinion really quickly, almost without thinking
- The speed of idea generation is key, focus is on quantity rather than on quality of ideas
- The aim is to quickly generate as many ideas as possible
- Building on the ideas of others is allowed and even encouraged for usage
- The criticism of ideas and censorship are forbidden

However, in terms of capturing knowledge from customers, brainstorming can be applied also for receiving thoughts and ideas from customers. The company should choose the targeted customers or lead users and conduct a brainstorming session. It is recommended to conduct them

in a neutral atmosphere or in a dinner format in order to encourage discussion and idea generation. Customers are more likely to respond honest and complete when they feel their importance and the atmosphere around is relaxed and even fun (ThinkAroundCorners blog, 2009). That is why brainstorming with customers can be a good variant not only for generating ideas but also receiving valuable insights and feedback.

1.3.2. Specialized instruments and methods of capturing knowledge from customers

The next type of instruments and methods the author classified as specialized ones. If the general instruments and methods of knowledge management can be used in a variety of ways, due to different targets, specialized instruments are mostly allow capturing knowledge in different forms from customers. As a general knowledge management instruments, specialized ones are also divided between online and offline. The number of specialized tools slightly exceeds the number of general knowledge management ones, and this reason can be explained that the author used special unified toolboxes for knowledge management instruments, where the number of appropriate instruments for author`s topic is limited. That is why the major number of instruments belongs to specialized ones.

1.5.1 *Alpha/Beta tests/Trial operations period*

Alpha and beta testing terms mostly belong to software/hardware development or games development industries, however, in common meaning, it means the provision of a product or service to potential or current customers in order to receive feedback, opinions and ideas based on experience of testing (Freiler, 2011).It also can be defined as trial operations period. Beta testing is described as an approach applied in the latter phases of the product design process, and aims to determine whether the product satisfies the needs of customers in term of functionality (does it work as customers wanted?) (Nielsen, 1993). In software development, working prototypes are usually placed with selected customers in order to test the influence of 'environmental factors', as well as the level of customer satisfaction (Kaulio, 1998). The results from these tests can be used in order to improve the product and to eliminate errors or “bugs”. The results of beta testing should be collected and analyzed. It is recommended to use beta testing as not the only tool of collecting feedback from customers, because usually beta tests are conducted a little time prior the product launch. And the results of the test should be taken into consideration, but when the time is slipping away, the company is not able to improve something within its product or service (Nielsen, 1993). Alpha testing has more time duration and starts long before product launch; it is conducted before beta test, however has the same role. Authors also highlight concept testing, the modernization and adding functions to a concept of a product

or service (Kaulio, 1998). Nevertheless, in this master thesis the author considers alpha/beta tests as a “test drive”, when customers use products or services and provide feedback.

1.5.2 Customer-oriented market surveys

Customer-oriented marketing survey is a type of marketing survey that is focused on gathering customer information, using both knowledge flows coming from customer and identifying knowledge about customers. Market research is a way of getting an overview of customers' wants, needs and behaviors. Therefore, the purpose of customer-oriented market research can differ and depend on the target of the company. Customers can possess knowledge not only about themselves, their experience with brands, products and services, but also they may know market trends, insights and general opinions on markets itself. As knowledge from customers can be captured only implementing primary research, there are main instruments within customer-oriented market research for capture knowledge (Pyle, 2010):

- Interviews
- Surveys
- Questionnaires
- Focus Groups

According to author's classification of instruments and methods of capturing customer knowledge, all of the instruments of customer-oriented market surveys are also highlighted in this master thesis. However, they are considered as an independent instruments, while the customer-oriented market research is a complex thing, where every of the mentioned instruments can be used.

1.5.3 Feedback forms

Many websites now have widgets that allow website visitors (it can be potential or existing customers) writing a feedback, ask questions or request a call from the company. It is a simple tool, provides companies the channel of getting feedback directly from the website. In addition, the widget or form can be modified into survey mode.

1.5.4 E-mail distribution asking for feedback

This instrument is a simple e-mail distribution among customer database with a request to give feedback. Often these email distributions are organized when clients just purchased products or used services of the company.

1.5.5 Feedback collection systems

Feedback collection tools can be various types; however, the common thing they allow is solicitation of feedback via the web and provision of connection with the customers. The list of functions that feedback collection tools provide is the following:

- A forum is connected to the company's website as a widget, where customers are able to post comments, ask questions, share ideas and thoughts. The examples of a such tools are UserVoice², UseEcho³, Reformal⁴, UseResponse⁵;
- Online communities of customers that can be created for every company where customers post ideas share their opinions and thoughts. The distinctive feature here is that online communities can be created both by companies and also by customers, using special tools such as SuggestionBox⁶, GetSatisfaction⁷, Copiny⁸;
- Complex services that allow connecting widgets to websites, mobile applications, geolocation services, emails, and to analyze the feedback coming from all of these instruments within one tool. OpinionLab⁹ is a bright example;

1.5.6 Feedback in mobile apps + in AppStore, GooglePlay

Mobile applications are now extremely popular among businesses and in general as well. According to Gartner, by the end of 2017, market demand for mobile app development services will grow at least five times faster than internal IT organizations' capacity to deliver them (Gartner, 2015 <http://www.gartner.com/newsroom/id/3076817>). Moreover, along with the

²Source: <https://www.uservoice.com/>

³Source: <https://userecho.com/overview/community-forum/>

⁴Source: <http://reformal.ru/>

⁵Source: <https://www.useresponse.com/ru>

⁶Source: <http://www.suggestionbox.com/>

⁷Source: <https://getsatisfaction.com/corp/>

⁸Source: <http://copiny.ru/>

⁹Source: <http://www.opinionlab.com/tour/give-your-customer-a-voice/>

forecasts of mobile phone sales by 2019 are going to reach 2.1 billion units, it becomes clear that mobile apps is a powerful instrument for businesses (Gartner, 2015). Companies often have the mobile applications not as the core product or service, but as supporting tools, providing advises, FAQ sections, databases (Gartner, 2015). However, in both cases (core and supporting application) feedback forms and evaluation rates can be installed inside the application, asking user to receive a feedback. Another way to get a feedback about application mostly is its profile page in AppStore or GooglePlay, where users post comments on application that can be important for the subsequent improvement of application.

1.5.7 Messengers

This type of instrument is a relatively new one. According to VC.ru, now businesses actively implement messengers, such Viber, What`s Up, Telegram, and use them as a new communication channel with customers. However, mostly small businesses and entrepreneurs use this channel (Goncharenko, 2016). In addition, several operators cannot use one messenger account in order to process messages, and now different services emerge that allow integrating every type of messenger with social networks and other channels of communication into one with clear usability, e.g. ManyChat¹⁰. Some customers prefer using messengers rather than calling or browsing website of the company due to several common reasons: they just are not willing to call people they do not know, it is easier to write them using smartphone; messenger is simple tool and the communication channel that is actually “homely” for the customer. That is why they are more involved in the communication process and likely to provide feedback, ideas (Goncharenko, 2016). What is more, messengers are evolving, their functionality is growing as well, and with the development of integration between messengers and control systems, smart “bots” and other trends, this channel is expected to be perspective and widely used.

1.5.8 Ethnography and Netnography

These types of research are closely connected to each other. Both cope with observation of customers, users or individuals in general. The main difference lies in the name itself: netnography in plain English is an online-based ethnography. Next, the more precise description is provided.

According to Anderson (2009), ethnography is the branch of anthropology, that suggests trying to analyze and understand how people live, react on some issues, identify behavioral patterns. Ethnography supposes following customers, visiting their homes, literally watching them (Anderson, 2009). Stebbins (1997), Arnould (1998), Goulding (2005) highlighted that

¹⁰Source: <http://manychat.com/>

consumer-oriented ethnography tries to identify cultural and/or social structured patterns of action; therefore ethnography can be used for analyzing the lifestyles given the cultural or sub-cultural context. By understanding how people live, researchers discover otherwise elusive trends that inform the company's future strategies (Anderson, 2009). For example, Intel employs two dozen anthropologists and ethnographers, because ethnography helped the company to come up with new strategic directions in smartphones area, where they analyzed the behaviors of children, who used cellphones since elementary school and it was the first smart device they ever used, and adults, who came to cellphones only after becoming experienced with PCs.

While netnography, according to Kozinets (2010), uses the social media as a way to continuously build high-level consumer insights. In netnography, online interactions are valued as a cultural reflection that yields deep human understanding. Like in person ethnography, netnography is naturalistic, immersive, descriptive, multi-method, adaptable, and focused on context. Used to inform consumer insight, netnography is less intrusive than ethnography or focus groups, and more naturalistic than surveys, quantitative models, and focus groups. Netnography fits well in the front-end stages of innovation, and in the discovery phases of marketing and brand management (Kozinets, 2010).

The bright example of using netnography is Beiersdorf, German cosmetics company. In 2008, the Nivea, brand of Beiersdorf planned to involve customers in the development of new deodorant. In order to do it, the company conducted netnography studies and analyzed forums, blogs and several websites, trying to understand what actually customers want. However, they realized that there is a problem that customer are facing: stains that deodorants left behind on clothes (Perepu, 2014). Later it resulted in new product, Rexona Invisible for Black&White. So, both ethnography and netnography can be powerful tools for identifying insights from customers.

1.5.9 Sentiment analysis

Opinions play an important role in almost every aspect of people life. They are central to most human activities and heavily influence people behaviors. Usually, our perceptions of reality, our choices and decisions we make are connected how others see and evaluate the world. In many cases when we are going to make a decision, we seek out the opinions of other people. However, this fact is not only true for individuals but also true for companies. "Opinions and its related concepts such as sentiments, evaluations, attitudes, and emotions are the subjects of study of sentiment analysis and opinion mining" (Liu, 2012, p.5). The popularity and rapid growth of the sentiment analysis is connected with those of the social media on the Web. Discussions on

forums, reviews in social networks, tweets provide companies with a significant volume of customer data and opinions (Liu, 2012). Sentiment analysis that is also called opinion mining, can be defined as the field of study that analyzes people's opinions, sentiments, evaluations, attitudes and even emotions towards different things such as companies' products or services, quality level, brand itself, events, topics, and other things (Liu, 2012; Pak, Paroubek, 2010).

The good example of using sentiment analysis is AirAsia, low-cost carrier of Malaysia that used Twitter as a basis for analysis. The results of sentimental analysis indicated 4 main reasons why customers posted negative comments and consequently had negative opinion on the company. In order to distinguish between bad and good opinions, they implemented the words polarity, where positive, negative and stop words were identified (Liau and Tan, 2014). The identified problems included flight cancellation issues, lacking of constant good customer service, poor post-booking management and ticket promotion. However, in overall, customers were satisfied (Liau, Tan, 2014).

1.5.10 Focus groups

The next instrument of capturing knowledge from customers is classic one, the focus group. It is one the oldest instruments for conducting qualitative research, rooting back to 70s (Gibbs, 1997). Powell et al. (1996) defined a focus group as a group of individuals selected and organized by researchers in order to discuss and comment on chosen topic that is the subject of research. The important thing here that discussion is based on personal experience of focus group members. Therefore, the key feature of focus groups is the insight generation and data production by the interaction between participants (Gibbs, 1997). This technique suggests convening a group of participants or respondents, usually eight to ten, in order to organize a more or less open-ended discussion about a product. Discussion "moderator" participates in discussion and makes sure that topics of marketing significance are raised. The research report summarizes discussion, and sometimes includes things that were not said, in order to see full picture (Calder, 1977). Now focus groups are widely used by companies and their main application is acquiring feedback regarding new products. Focus groups are implemented in the early stages of product or concept development, when organizations create the main direction of product or service development. In some cases, focus groups allow companies planning market initiatives (development, package, naming, market test for a new product), to discuss, view, and/or test the new product before it is made available to the public (Greenbaum, 2000). The findings may provide valuable information whether the potential market accepts the product or not. What is more, focus groups can be used for insights and idea collection, testing products and concepts before market launch.

1.5.11 Design thinking methods

During the process of finding out methods and tools for managing knowledge from customers, one of the experts the author consulted with, told him about design thinking and methods within that area. Another expert confirmed the importance of design thinking methods, so it was decided to include them into the classification.

Herbert Simon invented the term in 1969 and later in 1991, Kelley adapted design thinking for business purposes. Initially, design thinking is a methodology that is used by designers to solve complex problems, come up with needed solutions for clients. Linda Naiman said: "Design thinking draws upon logic, imagination, intuition, and systemic reasoning, to explore possibilities of what could be, and to create desired outcomes that benefit the customer"¹¹. A design mindset is not problem-focused, but solution-focused, and oriented on action. It involves both analysis and imagination. Unlike analytical thinking, design thinking suggests coming up with ideas, without limitations on breadth and fantasy. It encourages creation of different, sometimes unique and crazy ideas that can solve the problem in a best way, but focusing firstly on solution and then on problem solving. Design thinking doesn't know the wrong thoughts or ideas, everything can be mentioned and offered to act as a solution (Mootee, 2013).

Talking about business adaptation, design thinking can be applied as a good methodology for decision making process, idea generation, research process. As it is a methodology, it can include various methods and different methods can be used for different aims or business targets. Plattner et al. (2011) offered the main principles to design thinking:

- The human rule – all design activity is ultimately social in nature
- The ambiguity rule – design thinkers must preserve ambiguity
- The re-design rule – all design is re-design
- The tangibility rule – making ideas tangible always facilitates communication

Therefore, concluding the principles, it is possible to say that design thinking methods can be used within the companies because it allows creating unusual, creative decisions, human oriented, allows active communication. What is more, it can be also used for product development, requirements gathering; consequently it can be used for communicating and gathering knowledge from customers.

¹¹Source: <http://www.creativityatwork.com/design-thinking-strategy-for-innovation/>

According to experts in this field, design thinking is defined as a people-oriented method of product or service development, where the distinctive features are deep dive into customer experience, multisided approach to identifying problems and solutions. Of course, for implementing design thinking approach the company should use specific tools. Below the author listed several tools that were used in different companies, even Russian ones (according to the expert he contacted with). Actually, these tools were invented by Luke Hohmann in 2006 and are oriented on gathering tacit knowledge from people. These tools are included into Innovation Games-set of collaboration frameworks that organizations can use to fuel their innovation process. The aim of using these tools varies from creation of corporate strategies to analyzing products or services in terms of competitive advantages, etc. They are really multifunctional and great for decision-making process, but here the author wanted to ensure which of them can be used for capturing knowledge from customers and have chosen appropriate ones (Hohmann, 2016).

Plus/Delta

The objective of this tool is to generate a constructive feedback. The sense of the game is that customers always have different ideas about how it is possible to improve products or services, but these thoughts are often formed as complaints. Therefore, Plus/Delta game allows customers to convert the negative feedback to useful information. As the results of the game, Plus/Delta provides the company with the insights and ideas on how the product or service can be improved in future.

The game starts when the customers draws a T-chart. On the one side, he draws plus sign as an indicator of positive feature and on the other side, he draws delta sign as a place for changes. Next, customers come up with positive things that are good and should be repeated in the future, and elements that should be improved further. Further step is putting high priority elements on the top of both columns. In the end, all results are being analyzed and discussed in order to identify the ways of improving the negative elements.

Speed Boat

First step of the game is drawing a boat on a paper. Boat supposed to be fast. Unfortunately, the boat is not too fast because of some anchors holding it. The boat is a representation of the product/service or even the brand, and company wants to review it. Features of things that customers do not like are presented as anchors. Customers are asked to write down what they do not like on an anchor. They can also think of speed of the boat if it was without this anchor, in other words, they can estimate the effect of eliminating the bad feature

from the product or service. When customers finish drawing the anchors, each of the anchor should be reviewed and analyze, in order to understand carefully what is not applicable for customers and what can be improved.

Product Box

This in-person game is designed for identification of the most exciting features of a product or service. Customers should imagine that they are located in the public market and their aim is to sell a product. The company should give them several boxes or packages for the product and ask them to make a design of the product box that they are willing to purchase. Customers should draw the key marketing slogans they like on the box. In the end, customers should sell their boxes to the company representative and other customers. And finally, the last step is the identification of what was in focus (key product feature that customers liked and wanted to but the product).

The Spider Web

The Spider Web game can help companies to understand how the customer perceives the relationships between the company's product or service and other companies' products or services. Received information can be used later for innovation processes that appear due to new ideas from these relationships. The sense of the game is the following: the customer draws a cycle, draws company's product in the center of this cycle. Then he should draw another products that he finds similar or related to company's product. Organizer of the game asks customer also to draw and explain connections between products, indicate pluses, minuses, preferences and other things. Organizer also asks customer how he uses these products and for what purposes

Start your day

This instrument suggests asking the customer to describe the daily, weekly, monthly, or even yearly events or activities that are related to the use of company's product. Customer should use poster-sized calendars or a simple time line that is illustrated on a paper. The customer then describes events on different time basis where the possible usage of company's products takes place. The important thing here that customers should include really different events and situation where the product can be used. During the process, the organizer should watch what actually is great in product and what is not really good.

Value proposition Canvas

Alexander Osterwalder expanded his Business Model Canvas, namely Value Proposition and Customer Segment parts into separate concept tool, called Value Proposition Canvas. This

tool makes explicit how the customer value is being created. It helps companies to design products and services that customers want and need (Strategyzer.com, 2015). Analyzing the concept, it includes 2 part: customer part and company part. The customer belongs to special segments, and it has tasks, needs. In addition, customer has so-called pains and gains: what concerns and conversely, what positive emotions he has. From the other side, the company has product or service, which in its turn has special features and benefits for customers that should relieve customers' pains and create customers' gains (Strategyzer.com, 2015).

Now, when the classification is created, the following task arises. The classification of methods and instruments of capturing knowledge from customers should be compared with those instruments and methods that companies in electrotechnical and software development industries use under the 4W context of their usage.

1.4. Summary of theoretical part and justification of research problem

Summarizing the instruments and methods classification, they are widely used for gathering customer knowledge in the form of feedback, ideas, thoughts, requirements and other forms. Of course, it is possible to find some additional instruments that were not mentioned here, and it may be a limitation. However, mentioned classification was created using quite popular and sometimes obvious instruments, but also more "unique" tools were mentioned.

Shifting to the research problem: the classification of instruments was created using different sources, some of them from marketing articles and web sites, others from knowledge management toolboxes and manual. Some instruments descriptions were also accompanied by examples of their application, or cases. However, there were not complete classification of them, and what is more important, the author could hardly find the list of all possible instruments (not separately marketing specialized tools or not separately knowledge management instruments), with the examples of usage of instruments for different purposes and under different context. Of course, separate cases with a broad description of one company that faced the usage of instruments were considered by the author, however they did not show the whole picture and were applicable only for analyzed company. Koo et al. (2009); Banerjee (2013); Plougastel, Bertin (2011); Dimitrova et al. (2009); Liao and Tan (2014) and other authors provided the author with quite good examples based on separate companies, the context of usage instruments and methods of capturing knowledge from customers. Therefore, the research gap or research problem consists in the absence of information about the influence of context on the choice of

instruments and methods of capturing knowledge from customers within electrotechnical and software development industries.

That is why it was decided to indicate an industry or two and identify how the context or conditions may influence the choice of instruments and methods of capturing knowledge from customers. Consequently, the author has chosen electrotechnical and software development industries and companies that operate within these industries in Russia for the research.

Therefore, the research question that were indicated are the following:

- What methods and instruments do companies from electrotechnical and software development industries use for capturing knowledge from customers?
- How context influences the choice of instruments and methods among these industries?

The next chapter is dedicated to the research methodology, method of data collection and data analysis.

CHAPTER 2. EMPIRICAL RESEARCH

2.1. Methodology

Researchers all over the world use for their research purposes different research designs and methods. It is due to diversity of the research tasks and styles of accomplishment; and in order to conduct the research in the best way (clear collection and representation of data, appropriate method of data analysis, etc.), researcher should choose the most suitable research design and, for sure, research approach (quantitative and qualitative). That is why it is important to pay attention to the different frameworks for the collection and analysis of data (Bryman and Bell, 2003).

2.1.1. Research approach

First, researchers distinguish between quantitative and qualitative research. The main difference is type of data used in the research. Quantitative research is a type of research strategy that emphasizes quantification in the collection and analysis of data, while qualitative research is a type of research strategy that emphasizes words rather than quantification in the collection and analysis of data. What is more, quantitative research underlines a deductive approach to the relationship between theory and research, in which the accent is placed on the testing of theories, while qualitative research underlines an inductive approach to the relationship between theory and research, in which the accent is placed on the generation of theories (Bryman and Bell, 2003).

As this research is aimed on exploration of methods and instruments companies from electrotechnical and software development industries use, context influences, effecting the choice of instruments between industries, it was suggested to use qualitative research, because information that was collected and research results are purely qualitative and explain results not from the numbers` point of view.

Before switching to research strategy, a short justification about industries choice. The reason was quite simple. First, the author needed to narrow the scope of this research and choose several industries that allows the author to conduct a comparative analysis between them. Second, both electrotechnical and software development industries are knowledge-intensive and quite sensitive to customer requirements and feedback. Finally, author`s academic advisor had a sufficient number of contacts among these industries. Of course, living and studying in Russia influenced the decision to contact the companies from both industries that operate in Russia. However, it does not mean that companies the author contacted have Russian origins, the only criteria is they are operating in Russia.

2.1.2. Research strategy

Researchers distinguish several types of research strategies or designs. A research strategy provides a framework for the collection and analysis of data. In other words, it is a general plan of how the researcher will answer the research questions.

Bryman and Bell (2003) provide the following classification of research strategies or designs. They divided types of research design or strategies into 5 major categories:

- experimental and related designs (such as the quasi experiment);
- cross-sectional design, the most common form of which is social survey research;
- longitudinal design and its various forms, such as the panel study and the cohort study;
- case study design;
- comparative design

The method, which is likely to fit this master thesis research strategy, is a comparative case study design. Case study design is the type of the research design that suggests the study using almost identical methods of two or more cases. In author`s situation, an object of the research or a case itself is a company within one or another industry. In addition, as two industries are considered and the author compares the usage of instruments within each industry, the research strategy converts to comparative case study research. One main advantage of the multiple case study research is that it improves theory building (Bryman and Bell, 2003). By comparing two or more cases, the researcher is in a better position to establish the circumstances in which a theory will or will not hold (Eisenhardt, 1989). What is more, Yin (2009) stated that case study research in general helps researchers to understand the link between the phenomenon

and context around it. And it is important in current research, because not only the instruments and methods play role, but also conditions, aims of companies, or context in total.

2.1.3. Data collection method

The next step of the research is choosing a research method for data collection in order to explore what is happening in electrotechnical and software development industries' companies. In order to identify the method of data collection, first the author decided, what information he would like to get. Based on literature review he needed some framework in order to identify the context of choosing and using the instruments of capturing knowledge from customers. The choice fell on 4W framework (Sergeeva and Andreeva, 2014) based on Johns' (2006) "Who? Where? Why? What?" framework. The framework asks four main questions, answering which allows disclosing the context. Initially, Sergeeva and Andreeva used the framework in order to explain how the research papers on knowledge sharing disclose the context above knowledge sharing in organizations. What is more, they stated that Johns' framework could be widely accepted and used for showing the elements of the context in different situations (Sergeeva and Andreeva, 2014). Therefore, the author decided to use it in his research. Answering 4 questions from the framework allows the author to form the context of using mentioned instruments and methods in order to answer his research questions.

The list of the features needed to be explored during data collection:

- WHO are the customers of the company?
- WHAT types and forms of knowledge from customers are collected?
- What are the targets of the company, why it captures knowledge from the customer? (WHY?)
- What is the company itself, the culture, management style, level of maturity, industry, etc. (WHERE?)
- Methods and instruments of capturing knowledge from customers were used in the company

Therefore, in results of the research the author wanted to compare two industries where the knowledge from customer play an important role, both industries heavily depend on product knowledge, requirements knowledge, and business process knowledge.

The crucial fact to take into account that not all companies are willing to inform researchers about their implemented tools, systems, especially in Russia. Due to personal experience with past research tasks the author realized this important fact. It means that sending just questionnaires would not be the best way to receive complete and reasonable results due to

its simplicity and inability of providing alternative answers and thoughts. However, questionnaires diffusion is a good decision to be implemented for primary data gathering because they can provide the researcher the initial information for analysis to decide what question he or she should include into interview guide. However, instead of questionnaires, author's academic advisor and the author used GSOM and advisor's network of contacts and found out companies' representatives for the primary research.

Therefore, the method of data collection was the following. The semi-structured interviews were conducted in order to get in-depth answers from the respondents. The method allowed to get the primary data from real-life specialists, who had the experience with managing customer knowledge. Experts' experience and knowledge was used in order to justify the choice of methods and tools of knowledge management tools, receiving their feedback and examples of cases and recommendations. As for experts themselves, they usually were communication channel managers, heads of marketing department, project managers or specialists that are in charge with close customer relations.

Bryman and Bell (2003) define semi-structured interview as an interview where the researcher has a list of questions on some specific topics to be covered, often it is a kind of an interview guide, but the interviewee has a really wide choice in the way how to reply. Questions may not follow on exactly in the way outlined on the schedule. Additional questions that were not planned to be asked, actually can be asked by the interviewer as the interviewer picks up on things said by interviewees. However, in the majority of cases, all the questions will be asked and an almost same structure will be used from interviewee to interviewee.

According to Saunders et al. (2007), semi-structured interview is a qualitative research technique, in which a researcher has a list of themes and questions to be covered, which may vary from interview to interview. The order of questions might vary as well depending on the flow of the conversation. However, some additional or not previously included questions might appear during the conversation. The nature of questions (open questions) and the open discussion imply that the data should be audio-recorded or questions should be answered in details in written form under the supervision of the researcher in order to avoid the response bias. Therefore, different authors assess semi-structured interviews almost similar in terms of open questions, freedom in conversation and overall logic and flow of questions.

Moreover, the research seem to be exploratory, because author's purpose was to find out what is happening in electrotechnical and software development industries' companies in terms

of instruments and methods of capturing customer knowledge (this information almost cannot be found in open sources or poor). Therefore, the research is both qualitative and exploratory.

Semi-structured interviews are used to gather data, which should be normally analyzed qualitatively (Saunders et al., 2007). Authors highlight the fact that the data collected should not only answer “what” and “how” questions, but also help to explore the “why” questions. Therefore, in the interview structure, the questions are also focused on reasons why this or that company uses this or that instruments; and also questions are easy to answer in open way for companies’ representatives.

However, if the researcher is beginning his research with a clear focus, rather than a very general concept of wanting to do research on a topic, it is likely that the interviews will be semi-structured ones, in order to address issues that are more specific. In cases when the researcher has a clear idea of how the data is going to be analyzed, additional structure of questions can be offered.

Due to presence of clear focus on instruments and methods of capturing knowledge from customers in the concept for interview and the author assumes the kind of information he would like to receive is also clear, semi-structured interviews are going to be implemented for this research. Information regards company in general its strategy and culture was searched through companies’ web-site information. Therefore, the overall method of data collection is the following.



Figure 12. Data collection method

In order to make the followed process of data analysis more simple, the author printed out all needed handouts for his respondents. Handouts included the overall concept map with a key point of this research (Appendix 1) that illustrated the main parts and components of this master thesis and was used for explaining the research aim and details. Another handout was a classification of instruments and methods and the author applied it for indication of used instruments. In case the company used an instrument, the author put a tick near its name in order to simplify the process of making notes.

Importance of personal contact

Talking about personal contact, Saunders et al. (2007) noticed that managers prefer to talk in freely manner rather than respond questionnaires and surveys, especially when the topic is relevant for business and manager is interested in this topic. That is why freely manner talks allows the interviewers to receive an immediate feedback on questions, and interviewers can be sure that they are getting a feedback from managers, not their assistants or secretaries as it happens with questionnaires cases. Personal interviews provide higher degree of control over the answers comparing to sending a questionnaire online. Moreover, personal conversation in general decreases the opportunity of occurrence false answers. Sometimes the personal contact is restricted in case if the interview is organized remotely, e.g. by phone or videoconference services. That is why some of semi-structured interviews were conducted face to face, in other case via Skype video calls service.

2.1.4. Data sample

Talking about sample, companies were searched through author's academic advisor's network of contacts plus GSOM network of contacts. We were able to include 3 companies from each industry into this research: in electrotechnical and in software development. Talking about first industry, 3 companies from it are market leaders, employ a significant number of employees all over Russia, heavily contribute to the development of Russian economy. However, the companies' countries of origin are not Russia. While for software development industry, 3 companies from it are medium or big influence companies. Their major specialization is business software development. The more precise description of each company is provided in Appendixes 1.1-1.6.

2.1.5. Research plan

As for actions to be included in the research plan, they are the following:

- Conducting a semi-structured interviews with specialists in the area of capturing knowledge from customers who had the experience with instruments and methods of capturing knowledge from customers
- Identifying what instruments and methods are used among electrotechnical and software development industries' companies
- Analyzing the results of semi-structured interview and secondary data, summarizing the main points
- Final framework completion

2.1.6. Data analysis method

While the process of gathering the data needed for this research, the method of data analysis was defined. In order to analyze data, it was decided to separate it into two categories. First, the list of instruments and methods was indicated. Second, the questions of the interview

that expanded 4W framework's questions were converted to 4W framework form again in order to fulfill the framework.

The analysis itself included combination of gathered data from all companies from one industry into 4W framework for identifying the context in that industry plus the same process for another industry.

Answers and secondary data connected with WHERE question included information about the company, the level of maturity of the organization, organizational culture, and strategy of the company. Before collection of the data the author assumed that due to limited data sample (in total 6 companies) the interconnections between companies within its' characteristics will be bounded. In reality, this assumption was partly approved.

Answers connected with WHO question included the description of customers, their types. Answers connected with WHAT question included forms and types of captured knowledge. And finally, answers connected with WHY knowledge described the aims and purposes of using instruments of capturing knowledge from customers.

The following part highlights the research findings and results with a conclusions and implications or research, as well as suggestions for future research.

2.2. Findings

This part of the master thesis is structured as following: first, findings appeared from primary and secondary data collection with the detailed description of each case were indicated. Second, the summary of the results of all cases within the industries, combining them into the framework, comparing electrotechnical and software development industries in terms of context of using instruments and methods of capturing knowledge from customers.

2.2.1. Findings from electrotechnical industry

The cases of companies are provided in Appendixes 1.1-1.3, where the author considered each company in terms of 4W context framework and indicated the instruments and methods that are used within them. As for findings, first the author highlights electrotechnical industry.

According to results of conducted interviews and secondary data analysis, all companies from electrotechnical industry heavily rely on several categories of customers. And as it was discovered, there is a need for them to capture knowledge from these customers.

In order to make it easier to understand findings, the author presents them in the form of 4W context framework table and discuss each dimension (W) of framework for electrotechnical industry.

Who?

The first dimension is *Who?* question. This dimension consider customers of companies, describes them. As different industries suggest different type of customers, this dimension may influence the choice of instruments. In author's cases, all contacted companies have two major types of customers: direct and non-direct. Direct ones can be defined as customers that buy products or services from contacted companies. Non-direct customers are defined as influential customers; their knowledge influence companies' decisions.

First, direct customers. Company A, and company C together have b2b customers in the form of distributors, retailers. While company B works directly with its customers who are large maintenance and construction companies, without third parties. In latter case, closer customer relations that include special technical consultant that realizes complex customer care before and after sales, relieves the company from usage of significant number of instruments of capturing knowledge from customers. Company A and company C also work directly with large companies in implementing complex energy networks, processes automation projects, etc. In this case, customer relations are close enough, however they are organized in a bit another way: meetings with customer representatives is major type of communication and knowledge capturing process.

Second, non-direct customers. All contacted companies from electrotechnical industry stated that in order to localize its products for Russian market they also contact so-called engineering centers of design institutions in order to clarify official requirements and standards for products. It is an important step in launching new products to Russian market.

What is more, company A and company C noted that designers, architects and integrators are important non-direct customers too. That is because these 2 companies produce products that are used in design and repair activities in apartments, such as power sockets, counters, switchers, etc. The reason of this fact is quite simple. Interior designers and architects may advise final customers to install products by well-known companies, because they are better quality and design. Therefore, companies are interested in this type of non-direct customers due to insights supply and knowledge that can be used for NPD, product design, etc.

To sum it up, customers as determiners of context of choosing and using instruments and methods of capturing knowledge from customers in electrotechnical industry play moderate role. Type of customer may influence the choice of instruments and methods, but it depends primarily on how company organizes its customer communication processes.

Where?

This dimension considers the company background, information, culture and strategy, so those elements that can describe the company itself and its business approach. However, the author used mostly information about strategy and management style or organizational mission/culture.

All three companies, A, B and C stated in their strategy for Russian market that localization of products is a key point. That is why market knowledge and product knowledge are important for them. Consequently, different types of knowledge suppose different methods of gathering that knowledge. That is why, company's strategy is a catalyst of the choice of instruments and methods of capturing knowledge from customers.

As for management style and organizational culture, the author did not find significant interrelationship between choice of instruments. However, in case of company B, as it claims to be customer driven and provide customers with close relations, the capturing of knowledge from customer is organized more simple and closer to customer, with basic instruments and methods, such surveys, feedback forms, etc.

To sum it up, the strategy and other features of the company such as organizational culture or management style are not too important in choice of particular instrument and method.

However, it is quite influential element when it is considered together with other conditions, such as aims of using knowledge from customers.

What?

Next dimension of 4W context framework is What? question. It considers types and forms of knowledge that are used by companies from electrotechnical industry. According to all respondents, forms or representations of knowledge can be different: insights, feedback, ideas, and requirements. Almost every form of information from customers that can be used by the company is defined as customer knowledge. However, types of knowledge are different. All companies (A,B and C) stated that they use different types of knowledge from customers: product knowledge, market knowledge, business process knowledge.

Product knowledge in this case is all type of information and knowledge that customers possess about companies' products. For example, features of desired products, positive or negative experience with a product is product knowledge. All contacted companies use product knowledge for different purposes.

Market knowledge in this case is a knowledge of market trends, competitor analysis, customer preferences and trends, etc. Market knowledge is captured from customers due to different reasons, e.g. company A uses surveys and questionnaires among its major customers in order to collect market knowledge for opportunities identification, new product development, market penetration. Company B uses market knowledge for market research purposes and orders market research from third parties. Company C, as company A uses surveys and questionnaires for strategic purposes.

Business process knowledge or knowledge of customer technologies is used by all companies for different purposes. Company A and C serve large customers with complex projects where new product development is impossible without considering concrete requirements from customer perspective in terms of business processes and technologies. Company B also uses business process knowledge as well as product knowledge for new product development in order to satisfy needs of customers, based on their business processes that is actual in construction industry.

To sum it up, types of knowledge and forms of knowledge themselves are quite strong determinants of instruments and methods choice, however, only considering them together with aims of knowledge usage. Of course, considering them alone is also good idea, and different type

of knowledge needed to be captured suggests different instruments, but not in all cases. For example, surveys can be used both in product knowledge for measuring customer satisfaction and in market knowledge for identifying market trends. That is why the author assumes that types of knowledge alone does not influence the choice of instruments and methods, only with specific aim of knowledge usage.

Why?

The most important dimension of 4W context framework for electrotechnical industry, as the author discovered from interviews. Dimension suggests key reasons why company captures knowledge from customers, for what purposes. This dimension is key for electrotechnical industry, because all companies' representatives agreed that first thing to consider before use the particular instruments or method of capturing customer knowledge is aim of using knowledge from customer. New product development as an aim suggests some instruments, while quality enhancements as an aim suggests another instruments. That is why the initial decision to make is to define the aim of using knowledge from customers.

Main aims of using knowledge from customers in electrotechnical industry are:

- Market research
- New product development
- Quality enhancements
- Product localization
- Customer satisfaction measurement
- Product requirements and standard clarification
- Internal business process improvement

Market research suggests usage of different instruments. Company A and company B use different approaches for market research. While company A conducts surveys and sends questionnaires to its customers, company B prefers to use third-party market researches. Company C also uses surveys for its customers as company A.

New product development for complex projects is organized in companies A and C as follows: brainstorming sessions with customer representatives are used for features discussions, idea generation of needed functions. Company B also uses brainstorming sessions for that purposes.

Product quality enhancements are mostly managed by using trial operations or “test drives”, where product is being tested by customer and after that customer provides feedback of what can be changed or improved (company A,B,C) use this instrument. Other instruments used

by all companies for quality enhancements are feedback forms on web sites, call centers, sometimes focus groups (company B).

Product localization is closely connected with NPD and quality enhancements, so the instruments used for this purpose are the same.

Customer satisfaction measurement is an important application or aim of usage knowledge from customer, because company is able to understand whether its products are appropriate for customers or no. As for instruments and methods, all contacted companies use surveys (NPS score), e-mail distribution asking for feedback, feedback forms on web site, call centers. Company A and C use sentiment analysis in order to identify whether final customers are satisfied or not (mostly for consumer goods, where final customers are people and may leave comments, reviews, feedback on the web, so it is not applicable for business customers). Company B for this purpose uses social networks, blogs and forums where analyzes feedback from final customers as well.

Product requirements and standards clarifications is used by all companies, because they follow their localization strategy and all new and existing products should be localized for Russian market. In order to manage this, companies contact engineering centers (design institutions) representatives and conducting interviews or organize workshops in order to clarify these requirements and standards for products.

Internal business improvement was mentioned only once in an interview with a company B. They stated that usage of call centers and web site feedback forms sometimes leads to improvement of internal business processes because customers notice some controversial things need to be improved.

4W context in general

Summarizing the whole 4W context influence on choice of instruments and methods of capturing knowledge from customers for companies of electrotechnical industry the author contacted with, it was noticed that all dimensions of context influence the choice of instruments and methods in some way. However, the most crucial dimension is Why? question and Who? question. As it was found out, these two dimensions should be fundamental context determiners of choosing instruments and methods of capturing knowledge from customers. Aims of application of knowledge from customers mostly explain the choice of particular instruments and methods, while the type and description of company's customer complements the choice of instruments.

However, basing only on three case companies it is rather hard to create a special model of choice of particular method or tools based on all dimensions, nevertheless below the author created the 4W context framework for electrotechnical industry in general (Figure 3), based only on 3 respondent companies. In order to classify all companies, the author averaged some results and removed the characteristic of management style/organizational culture, because companies are different in this case and management style with organizational culture alone do not determine the context of using and choosing instruments and methods of capturing customer knowledge.

The Figure 3, as well as Figure 4 should be used as follows: the reader should read from the left to the right, because the logic of the table suggests partly disclosure of the context of instruments and methods of capturing knowledge from customers choice.

Why	Who		What		Why	Instruments and methods of capturing knowledge from	
Goal	Source		Forms of knowledge	Knowledge Types	Application/goals to		
Localization of products for Russian market (common strategic element for all 3)	Direct	Retail Distributors	Insights, Requirements Feedback, Ideas, etc.	Market Knowledge	Market research	Surveys; Questionnaires; Partnerships	
		Companies Industry		Product Knowledge	Quality	Customer satisfaction	Focus groups
					Product knowledge, Business Process	DN	Brainstorming; Content analysis; Focus groups
	Non-direct	Final Customers		Product Knowledge	Quality	Test drives (trial operation period);	
		Engineering Centers		Product knowledge (requirements and standards)	Customer satisfaction	Feedback forms on web site; Surveys; Call-centers; Sentiment	
					Productization		
				Product Knowledge	NPD (design, features, etc.)		

Figure 3. 4W context-driven framework for selection of instruments and methods for electrotechnical industry

2.2.2. Findings from software development industry

Second, findings from software development industry are presented. As for the industry itself, there is significant number of differences from electrotechnical industry in both instruments and methods of capturing knowledge from customers and context of choosing and using of these instruments and methods.

Where? Dimension

First, applying 4W context framework to software development industry indicated that some parts of W dimensions are not relevant within this industry. Namely, organizational culture and management style from Where? Dimension were changed to development approach or methodology. Development approach identifies the whole software development cycle, its stages. Two well-known approaches to development that are used by companies the author contacted with are Waterfall approach and Agile approach.

Waterfall approach or waterfall model suggests consistent implementation of all phases of the project strictly in a fixed order. The transition to the next stage means full completion of the previous phase. The requirements specified in the stage of formation of requirements, strictly documented in the form of technical specifications and is fixed for the duration of the project development. Each stage ends with the release of a complete set of documentation sufficient to ensure that the development could be extended by another development team. Therefore, this approach suggests a lot of documentation and procedures connected with requirements gathering from customers.

Agile approach suggests the use of iterative development, a dynamic formation of requirements and ensuring of their implementation by the means of constant interaction within the self-organizing working groups, consisting of experts in various fields and close customer relations (Agile Alliance, 2015). Therefore, Agile approach means more flexibility, less bureaucracy and documentation and less usage of instruments. According to company E and company F representatives, the main instruments are communication and companies specialists' minds.

What is more, exploring Where? Dimension of 4W context framework for software development industry, company strategy is also significant. For example, company D operates on Russian market mostly and is a large player on Russian market, while company E and company F are international companies and their customers are mostly non-Russian large companies. Therefore, their strategy on Russian market is finding excellent qualified employees and being attractive employer for them. According to company E and company F representatives, working

with large international companies suggests the fact that requirements are already mostly formalized on customer's side and there is no need to use special instruments and methods of capturing knowledge from customers for this purpose.

Who? Dimension

While working with majority of Russian customers suggests gathering and formalization of requirements for product or service by the means of company, not customer. Therefore, the customers' characteristics are also important within software development industry. It is not necessarily a rule that Russian companies when contacting with software development companies do not have already formalized requirements. That is why the author states that there will not be separation between Russian customers and foreign customers in a context on choice of instruments for capturing requirements for service or product.

As for customers in general, all three contacted companies (D, E, F) stated that they work with large, enterprise-class companies and state organizations from different industries. However, company F mostly focuses on financial, telecommunication and R&D companies, while for companies D and E there is no clear industry focus.

What? Dimension

Switching to next dimension (What?), all companies, as they are IT companies that develop software, they all need to know the finest details about customers' businesses. Therefore, as an object of knowledge from customers, there are business process knowledge that includes also technology knowledge of already installed and used services customers have. Sometimes (company D), companies also capture market knowledge that includes knowledge about their former and current clients, their needs. Alternatively, in the forms of insights and opinions from potential customers about new services prototypes.

Why? Dimension

Finally, Why? Dimension of 4W context framework. The applications and aims of using instruments and methods of capturing knowledge from customers in software development industry are quite predictive. Companies collect knowledge from customer in order to know what service or product they should develop. All of three contacted companies use service/product requirements for developing new service/product. What is more, the process of development suggests trial operations periods where customers test software and provide company with feedback, make changes. That is why, quality enhancements as applications of using instruments and methods are also applied within software development companies.

Customer satisfaction analysis or measurement is important, however not all companies use instruments and methods of capturing knowledge from customers for that purpose. Company D, as it follows non-Agile approach of software development, uses formal questionnaires for this task. While companies E and F that follow Agile approach, simply know whether the customer is satisfied or not by continuous communication process.

Sometimes companies use knowledge from customers for collecting insights from potential customers in order to use them in NPD, or conduct market research in order to identify needs of their former and current customers due to offer them some other product or service (company D).

4W context in general

Considering the overall 4W context influence on choice of instruments and methods of capturing knowledge from customers, it is quite influential, however not in all dimensions.

First, it was found out that Where? Dimension is extremely important, and especially the approach to software development. Agile-based methodologies or approaches to software development clearly define usage of instruments and methods of capturing knowledge from customers. According to findings, as Agile-based approaches do not respect comprehensive documentation, complex processes and broad number of instruments, companies that follow Agile just do not focus on lots of such instruments and methods. Communication is everything for them.

From another hand, non-Agile approaches within companies suggest these instruments and methods. Therefore, the author conclude that Where? Dimension is extremely important element of context that can explain the choice of instruments and methods of capturing knowledge from customers within companies from software development industry.

What? Dimension not really influences the choice of instruments alone, because initial element of choice is in Where? Dimension.

Who? Dimension that describes customers alone do not influence the choice of instruments. However, in case if the author conducted significantly more interviews, the situation could be different. But in current situation, Who? dimension is not influential alone.

Why? Dimension influences the choice of instruments well, however together with Where? Dimension.

That is why the author concluded that major elements of 4W context that influence the choice of instruments and methods of capturing knowledge from customers are Where? And Why? Dimensions.

2W		3W	4W		5W	Instruments and methods of capturing knowledge from customers	
Development		Forms of	Types of	Application/goal			
Typification and duplication of company's services to broad	Non-agile (e.g.)	Large companies, state	Requirements, Feedback, Opinions,	Product requirements (and product knowledge); Business process	DN	Interviews, Content analysis; Focus groups; Wiki; Brainstorming	
RO	RO				Customer	Beginning of relations with	"Test drive" (trial operations period); Task trackers; Wiki; Brainstorming
Being an attractive employer; Talent	Agile (e.g.)				Market	Market research (probable needs of current and former	
					Market research (collection of opinions and insights of product)alpha	Seminars/webinars; design toolsthinking	

Figure 4. 4W context-driven framework for selection of instruments and methods for software development industry

For the whole software development industry the 4W context framework was created. However, there was a need to combine all instruments and methods of capturing knowledge from customers from different companies into one framework, nevertheless all companies were different. Therefore, the need of another representation of author`s results appears.

2.3. Discussion

In order to manage the correct and clear representation or visualization of 4W context for both electrotechnical and software development industries, and simultaneously the instruments and methods that are used within these industries, the author decided to present the findings in the form of decision tree. Moreover, as author`s research problem included two research questions (what instruments and methods of capturing knowledge from customers are used + how the 4W context influence the choice of instruments and methods of capturing knowledge from customers), that way of combining both answers and presenting the difference between industries was chosen.

However, this type of representation is modified decision tree, as e.g. second level of choice suggests different variants for different industries.

First level of choice in decision tree (or tree diagram) is industry where the instruments and methods of capturing knowledge from customers are used.

When the industry is defined, it is time to choose the second level of choice:

- Why? Dimension is determining the further choice in electrotechnical industry (namely, applications and aims of using knowledge from customers)
- Where? Dimension is determining the further choice in software development industry (namely, approach or development methodology)

Third level of choice involves the following elements:

- Who? Dimension is determining the final choice of instruments and methods of capturing knowledge from customer in electrotechnical industry
- Why? Dimension is determining the final choice of instruments and methods of capturing knowledge from customer in software development industry

The decision tree is presented below (Figure 5).

Decision tree shows how the most influential dimensions of 4W context influence the choice of instruments among electrotechnical and software development industries.

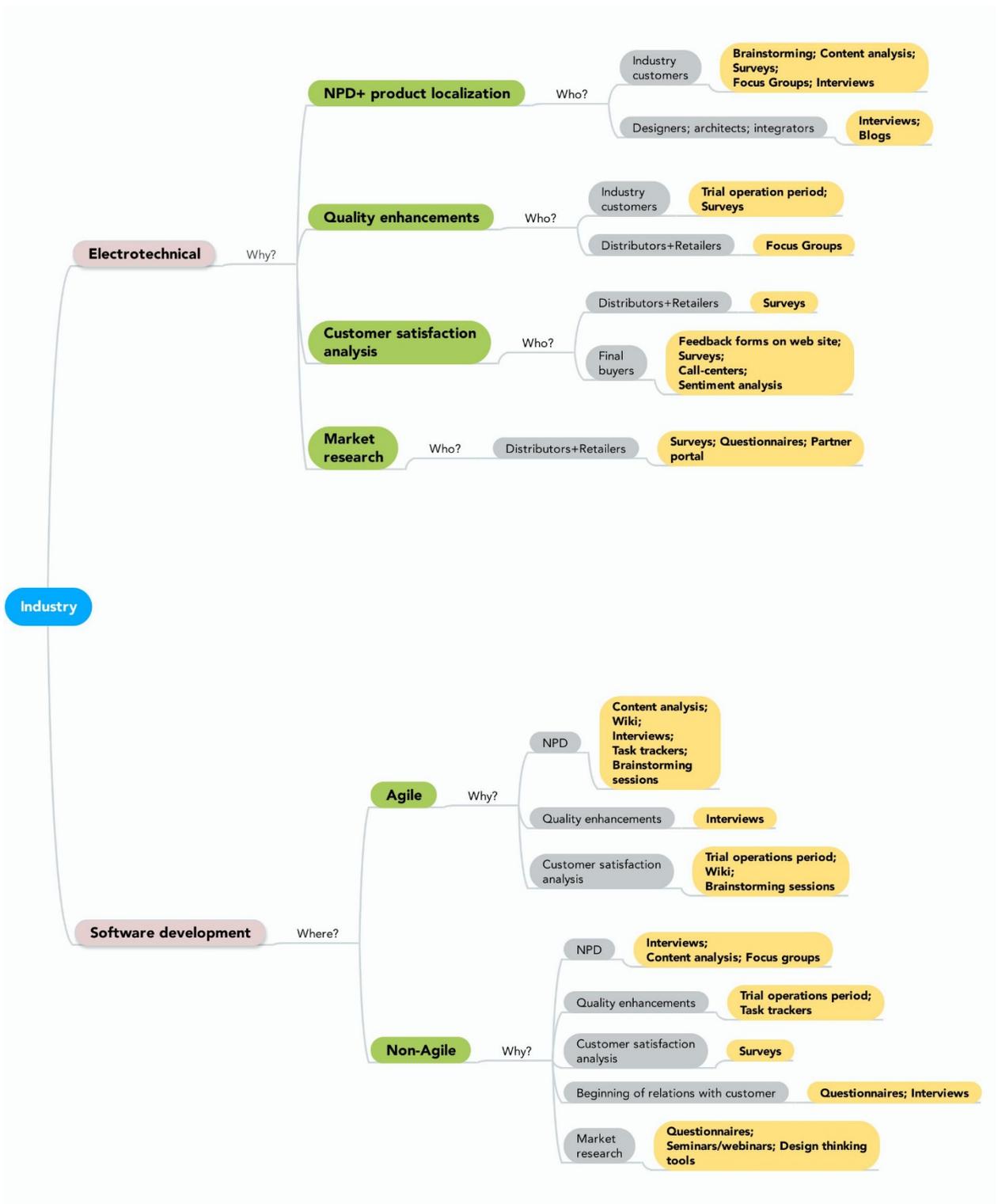


Figure 5. Decision tree of instruments and methods of capturing knowledge from customers

To sum all findings up, let the author remind main research questions:

- What methods and instruments do companies from electrotechnical and software development industries use for capturing knowledge from customers?
- How context influences the choice of instruments and methods among these industries?

Instruments and methods that used by companies from both industries are presented in Appendixes 1.1-1.6; however they are included in 4W context framework for each case company. For combined 4W context framework for each industry the author averaged results and eliminated some instruments that we used only in one company and their usage was not too important for company's process of capturing knowledge form customers. That is why in this work the author highlights mentioned instruments and methods together with context dimensions.

However, the table below presents of list of instruments and methods of capturing knowledge from customers for both industries with the count of companies (out of 3 for each industry) (Table 1).

Electrotechnical	№ of uses (out of 3)	Software Development	№ of uses (out of 3)
Brainstorming	3	Brainstorming	2
Content Analysis	1	Content Analysis	3
Surveys	3	Surveys	1
Focus Groups	3	Focus Groups	1
Trial operation periods	3	Trial operation periods	3
Feedback forms on web site	3	Wiki	2
Call centers	3	Task trackers	2
Sentiment analysis	2	Messengers	1
Interviews	3	Interviews	3
Partner portal	1	Design Thinking tools	1
Questionnaires	2	Questionnaires	2
Webinars	1	Webinars/Seminars	1
Market research	1		
Email distribution asking for feedback	2		
Social networks	1		
Design Thinking tools	1		
Feedback in Mobile Apps	1		

Table 1. List of instruments and methods of capturing knowledge from customers for 2 industries

As for the context of choice of instruments and methods of capturing knowledge from customers, first it was identified that companies both from electrotechnical and software development industries use this knowledge for different purposes, and especially for new product or service development and quality enhancements and improvements. This fact confirms the Harlow's (2008) statement that companies using instruments and methods for managing knowledge are more successful with innovative procedures, such as NPD and improvements of products.

Second, it was identified that context in the form 4W framework matters in the process of choice of instruments and methods of capturing knowledge from customers. The most influencing dimensions were chosen among each industry and therefore the main differences between industries are the following:

- Electrotechnical industry's companies first consider Why? Dimension, on other words, firstly company identifies application or aim of instrument usage and it is the first step of choice. The second step is identification of the customer itself. Therefore, applications/aims together with customer description define the context for that case
- Within software development industry's companies, in contrast, Where? Dimension is firstly should be considered. Namely, the approach to software development defines further instruments and methods of capturing knowledge from customers. Agile-based approaches suggest close cooperation and constant personal communications with customers and minimal number of instruments, while non-agile approaches suggest significant requirement gathering processes, documentation and many instruments and methods of capturing knowledge from customers. Moreover, Why? Dimension of context is a second order importance dimension to be considered in choosing instruments and methods

The representation of differences between two industries in terms of context influences and used instruments and methods of capturing knowledge from customers is shown above (Figure 5).

The following part of this thesis is final one and concludes the whole work, pointing out limitations and suggestions for the further research.

CONCLUSION

The following conclusion summarizes the thesis and findings from interviews with companies from electrotechnical and software development industries. As the research problem consisted in identifying the 4W context influence on choice of instruments and methods of capturing knowledge from customers among mentioned industries, the author's primary task was to identify these instruments and methods. In order to do it, literature analysis was made.

It turned out that before exploring instruments and methods of capturing knowledge from customers, there was a need of knowledge and knowledge from customer definition and classification. Knowledge from customers was classified in terms of object of knowledge, representation or form of knowledge. Further, the importance of using knowledge from customers was highlighted. It was mentioned that it could be used for NPD, improvement of products or services, for market or customer research purposes and other aims.

Therefore, based on literature sources, the classification of instruments and methods of capturing knowledge from customers was created. The separation between general instruments of knowledge management and specialized instruments of capturing knowledge from customers was done. The author assumed that classification could be incomplete due to its universalism, and stated that it would be interesting to check what additional instruments and methods of capturing knowledge from customers are used among electrotechnical and software development industries.

Industries choice justification consisted in the fact that both industries are quite knowledge-intensive, and customers often have an opinion when designing and developing a new product or service takes place, or when providing feedback for product improvement. What is more, industries were also chosen due to the fact that author's academic advisor had a significant number of contacts within these industries.

As for methodology of the thesis, multiple case study strategy was chosen. Each case is a company, working in electrotechnical or in software development industry. Cases consisted of 6 companies in total, 3 from each industry. In order to collect data from these companies, two kinds of data were used: primary data was captured using semi-structured interviews with companies' representatives, while secondary data was used from companies' web sites or annual reports.

In order to analyze the data and present findings, the author used 4W context framework by Johns (2006). Each W means dimension. Each dimension should answer the following four

questions: Where, Who, What, Why. Answering these questions, it is possible to indicate the context (In author's case, the context of choosing instruments and methods of capturing knowledge from customers between two industries).

After conducting semi-structured interviews with all companies' representatives, 4W context framework was applied to every case. The framework described the following things:

- The strategy of the company; approach to software development (for software development industry), organizational culture and management style (for electrotechnical company). That was used in order to define, if applicable, internal motives of using or not using knowledge from customers and therefore, instruments of capturing this knowledge (Where?)
- The definition of customers of case companies, in order to classify them (Who?)
- Forms of knowledge and objects of knowledge in order to show what concrete knowledge from customers, case company receives (What?)
- Applications or aims of using knowledge from customers, in other words, why company uses knowledge from customers and instrument of its capturing? (Why?)

After, this framework was applied to both industries in general and it showed the importance of several 4W dimensions between industries. The author indicated them as follows:

- In electrotechnical industry, the initial step in choosing process is identifying the aim of using the instrument or method of capturing knowledge from customers, while in software development the first thing that influence the choice is approach or methodology of software development
- What is more, in electrotechnical industry, after defining the aim of using knowledge from customers, company should decide what customers are going to be involved in knowledge customer process
- In software development industry, when the development approach or methodology is known, aim or application of knowledge from customers and therefore, instruments of capturing this knowledge should be defined

In order to visualize these differences of 4W context between industries, a representation in a form of modified decision tree was created (Figure 5). General lists of instruments and methods of capturing knowledge from customers for both industries are also presented.

Research limitations

As for the limitations of this thesis and research, first, due to limited number of cases the results may be relevant not for all companies. However, in electrotechnical industry all contacted

companies were large, well-known and the main difference between them was in products they produced, therefore this limitation is not too critical for electrotechnical industry. As for software development, companies were really different in many terms, however, the main influencer of context was the approach or methodology of development, that is why the results obtained are logically connected with the differences in development approach between companies.

Another possible limitation suggests the data distortion, because the author contacted different people, they had different positions within companies and therefore their answers were based on their perception of the topic. This could lead to results inaccuracies.

Suggestions for further research

As only two industries were considered in this thesis, the first suggestion is exploring the same subject within other industries.

Second, the more detailed research of practical implications of usage of mentioned instruments and methods can be conducted, with their advantages and disadvantages, effects on company can be considered.

Finally, within this topic of instruments and methods of capturing knowledge from customers, knowledge sharing issues can be considered as well. In other words, the presence or absence of problems with sharing of the knowledge in process of using of mentioned instruments.

REFERENCES

- Ackoff, R. L. (1989). From Data to Wisdom, *Journal of Applied Systems Analysis*, Volume 16, p 3-9.
- Agarwal, R. & Tanniru, M. (1991). Knowledge extraction using content analysis. *Knowledge Acquisition*, 3(4), 421-441.
- Aitamurto, T. (2012). Crowdsourcing for Democracy: A New Era in Policy-Making, Publication of the Committee for the Future Parliament of Finland. ISBN: 978- 951-53-3460-2.
- Alton Y.K Chua Snehasish Banerjee, (2013). Customer knowledge management via social media: the case of Starbucks. *Journal of Knowledge Management*, Vol. 17 Iss. 2 pp. 237 – 249.
- Anderson, J. & Tavassoli, N. (2012). *Nespresso. What Next?*. London Business School.
- Anderson, J., Kumar, N., & Narus, J. (2008). Certified value sellers. *Business Strategy Review*, 19(1), 48-53.
- Anderson, K. (2009). *Ethnographic Research: A Key to Strategy*. *Harvard Business Review*. Retrieved 25 April 2016, from <https://hbr.org/2009/03/ethnographic-research-a-key-to-strategy>
- Arnould, E.J. (1998). Daring consumer-oriented ethnography. in Stern, B. (Ed.), *Representing Consumers: Voices, Views and Visions*, Routledge, London.
- Bee Yee Liao Pei Pei Tan, (2014). Gaining customer knowledge in low cost airlines through text mining. *Industrial Management & Data Systems*, Vol. 114 Iss 9 pp. 1344 – 1359.
- Bryman, A. and Bell, E. (2003). *Business research methods*. Oxford University Press.
- Bueren, A., Schierholz, R., Kolbe, L., & Brenner, W. (2005). Improving performance of customer-processes with knowledge management. *Business Process Mgmt Journal*, 11(5), 573-588.
- Calder, B. (1977). Focus Groups and the Nature of Qualitative Marketing Research. *Journal Of Marketing Research*, 14(3), 353.
- Campbell, A.J. (2003). Creating customer knowledge competence: managing customer relationship management programs strategically. *Industrial Marketing Management*, Vol. 32 No. 5, pp. 375-83.

Chesbrough, H. & Appleyard, M., 2007. Open Innovation and Strategy. *California management review*, 31(2), 386-408.

Chesbrough, H. (2006). *Open Business Model: How to thrive in the new innovation. Management Review*, 50, 1, 57-76.

Cr  e, D. and Micheaux, A. (2006). From Customer Data to Value: What is Lacking in the Information Chain?. *Journal of Database Marketing & Customer Strategy Management*. 13(4): 282-299.

Drogosch, S. & Stanke, T. (2015). *The Use of Crowdsourcing as a Strategic Marketing Tool - An Examination of Brand Perceptions and Behavioral Intentions* (Postgraduate). Lund University.

eGain (2015). *Knowledge Management for Contact Centers and Help Desks*.(1st ed.). Sunnyvale.

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *Academy of Management Review*, 14: 532–50.

Ellison, N.B., Steinfield, C. and Lampe, C. (2007). The benefits of Facebook ‘friends:’ social capital and college students’ use of online social network sites. *Journal of Computer-mediated Communication*, Vol. 12 No. 4, pp. 1143-68.

Ernst, H., Hoyer, W. D., Krafft , M., and Krieger, K. (2010). Customer relationship management and company performance—the mediating role of new product performance. *Journal of the Academy of Marketing Science*, Vol. 39, No. 2, pp. 290-306.

Fang, S.C. and Tsai, F.S. (2005). Knowledge sharing routines, task efficiency, and team service quality in instant service-giving settings. *The Journal of American Academy of Business*. Vol. 6 No. 1, pp. 62-67.

Feng, Tian-Xue & Tian, Jin-Xia (2005). CKM and condition analysis of successful CKM implementation. In the Fourth International Conference on Machine Learning and Cybernetics, 18 - 21 August 2005, Guangzhou.

Freiler, L. (2011). *Centercode | Beta Test Management Software and Managed Betas*. Retrieved 25 April 2016, from <http://www.centercode.com/blog/2011/01/alpha-vs-beta-testing/>

Garc  a-Murillo, M. & Annabi, H. (2002). Customer knowledge management. *J Oper Res Soc*, 53(8), 875-884.

- Gartner web site (2015). *Gartner Says Demand for Enterprise Mobile Apps Will Outstrip Available Development Capacity Five to One*. (2015). *Gartner.com*. Retrieved 25 April 2016, from <http://www.gartner.com/newsroom/id/3076817>
- Gault, P., Masthoff, J., & Johnson, G. (2015). DiCER: A distributed consumer experience research method for use in public spaces. *International Journal Of Human-Computer Studies*, 81, 49-71.
- Gavrilova, T. & Andreeva, T. (2012). Knowledge elicitation techniques in a knowledge management context. *Journal Of Knowledge Management*, 16(4), 523-537.
- Gebert, Henning; Geib, Malte; Kolbe, Lutz; Riempp, Gerold (2002). Towards customer knowledge management: Integrating customer relationship management and knowledge management concepts. *The Second International Conference on Electronic Business*.
- Gebert.H.,Geib.M., Kolbe.L., Brenner.W., (2002). Knowledge-enabled customer relationship management: integrating customer relationship management and knowledge management concepts. *Journal of Knowledge Management*. Vol. 7 Iss: 5, pp.107 – 123.
- Geisler, E., Wickramasinghe, N. (2009). *Principles of Knowledge Management*, M. E. Sharpe.
- Gibbs, A. (1997). Focus Groups. *Social Research Update*, 19, Winter. Department of Sociology, University of Surrey. <http://www.soc.surrey.ac.uk/sru/sru19.html>
- Goulding, C. (2005). Grounded theory, ethnography and phenomenology. *European Journal Of Marketing*, 39(3/4), 294-308.
- Greenbaum, T.L. (1998). *The handbook for focus group research* (2nd Ed). Thousand Oaks, CA: Sage.
- Gunawardena, C.N., Hermans, M.B., Sanchez, D., Richmond, C., Bohley, M. and Tuttle, R. (2009). A theoretical framework for building online communities of practice with social networking tools. *Educational Media International*, Vol. 46 No. 1, pp. 3-6.
- Hague, N., & Hague, P, Morgan, C. (2013). *Market Research in Practice : How to Get Greater Insight From Your Market Ed. 2*. Kogan Page.
- Harlow, H. (2008). The effect of tacit knowledge on firm performance. *J Of Knowledge Management*, 12(1), 148-163.
- Hashem, A. (2008). *Interview Manual*. Ramesh Publishing House, Delhi.

- Helie,S; Sun, R. (2010). Incubation, Insight, and Creative Problem Solving: A Unified Theory and a Connectionist Model. *Psychology Review* 117 (3): 994–1024.
- Hodder, I. (1994). *The interpretation of documents and material culture*. Thousand Oaks etc.: Sage. p. 155.
- Hohmann, L. (2016). *Innovation Games | The Collaboration Frameworks that Power the Conteneo Collaboration Cloud*. *Innovationgames.com*. Retrieved 25 April 2016, from <http://www.innovationgames.com/>
- Hooley, G. J., & Theoharakis, V. (2008). Customer orientation and innovativeness: Differing roles in new and old Europe. *International Journal of Research in Marketing*, 25(1), 69–79.
- Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Journal*, 49(1), 11–30.
- Kamberelis, G. & Dimitriadis, G. (2013). *Focus groups*. Abingdon, Oxon: Routledge.
- Kaulio, M. (1998). Customer, consumer and user involvement in product development: A framework and a review of selected methods. *Total Quality Management*, 9(1), 141-149.
- Knowledge exchange toolbox. UNICEF, 2015. Retrieved from <http://www.unicef.org/knowledge-exchange/> (Accessed 21.02.2016)
- Kohli, A. & Jaworski, B. (1990). Market Orientation: The Construct, Research Propositions, and Managerial Implications. *Journal Of Marketing*, 54(2), 1.
- Kozinets, R. (2010). *Netnography: The Marketer's Secret Weapon* (1st ed.). Mountain View: NetBase.
- Kozinets, R. (2012). Marketing Netnography: Prom/ot(Ulgat)ing a New Research Method. *Methodological Innovations Online*, 7(1), 37-45.
- Laage-Hellman, J., Lind, F., & Perna, A. (2014). Customer Involvement in Product Development: An Industrial Network Perspective. *Journal Of Business-To-Business Marketing*, 21(4), 257-276.
- Lee, R., Naylor, G., & Chen, Q. (2011). Linking customer resources to firm success: The role of marketing program implementation. *Journal Of Business Research*, 64(4), 394-400.
- LEGO Ideas - Home Page. (2016). *Ideas.lego.com*. Retrieved 25 April 2016, from <http://ideas.lego.com>

- Lehrer, J. (2012). *Groupthink - The New Yorker*. *The New Yorker*. Retrieved 25 April 2016, from <http://www.newyorker.com/magazine/2012/01/30/groupthink>
- Liu, B. (2012). *Sentiment analysis and opinion mining*. San Rafael, Calif.: Morgan & Claypool.
- Lukas, B. A., Whitwell, G. J., and Heide, J. (2013). Why do customers get more than they need? How organizational culture shapes product capability decisions. *Journal of Marketing*, Vol. 77 No. 1, pp. 1–12.
- Magnier-Watanabe, R., Yoshida, M. and Watanabe, T. (2010). Social network productivity in the use of SNS. *Journal of Knowledge Management*, Vol. 14 No. 6, pp. 910-27.
- Martin, Roger (2010). The Age of Customer Capitalism. *Harvard Business Review*, 88 (1/2), 58–65.
- Maswera, T., Dawson, R. and Edwards, J. (2006). Assessing the levels of knowledge transfer within e-commerce websites of tourist organizations in Africa. *Electronic Journal of Knowledge Management*, Vol. 4 No. 1, pp. 59-66.
- Mithas, S., Krishnan, M. S., and Fornell, C. (2005). Why Do Customer Relationship Management Applications Affect Customer Satisfaction? . *Journal of Marketing*. (69:4), pp. 201-209.
- Mitussis, D., O'Malley, L., & Patterson, M. (2006). Mapping the re-engagement of CRM with relationship marketing. *European Journal Of Marketing*, 40(5/6), 572-589.
- Naiman, L. (2016). *Design Thinking as a Strategy for Innovation*. *Creativity at Work*. Retrieved 25 April 2016, from <http://www.creativityatwork.com/design-thinking-strategy-for-innovation/>
- Naver, J.C. & Slater, S.F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing*, 54, 20-35.
- Nejatian, H., Sentosa, I., Piaralal, S., & Bohari, A. (2011). The Influence of Customer Knowledge on CRM Performance of Malaysian ICT Companies: A Structural Equation Modeling Approach. *IJBM*, 6(7).
- Nielsen, J. (1993). *Usability engineering*. Boston: Academic Press.
- Nonaka, I. & Takeuchi, H. (1995), *The knowledge creating company: how Japanese companies create the dynamics of innovation*, New York: Oxford University Press, pp. 284.
- Nonaka, I. and Toyama, R. (2003). The knowledge-creating theory revisited: knowledge creation as a synthesizing process. *Knowledge Management Research & Practice*, 1, 1, 2-10.

- Pak, A & Paroubek, P. (2010). Twitter as a Corpus for Sentiment Analysis and Opinion Mining. (European Language Resources Association (ELRA), Valletta, Malta).
- Paquette, S. (2006). Customer Knowledge Management. The Encyclopedia of Knowledge Management, D. Schwartz (ed.), Idea Group, 90-96.
- Trompette.P, Chanal.V, Pelissier.C. Crowdsourcing as a way to access external knowledge for innovation: Control, incentive and coordination in hybrid forms of innovation. 24 th EGOS Colloquium, Jul 2008, Amsterdam, France. <halshs-00367373>
- Perepu.I. (2014). *Open innovation at Beiersdorf: the launch of Nivea invisible for black & white*. IBS Center for Management Research.
- Plougastel, D. & Bertin, M. (2011). *Customer Knowledge Management at Komatsu Forest* (Post Graduate). Umeå School of Business.
- Polanyi, M. (1966), *The Tacit Dimension*, University of Chicago Press: Chicago, 4.
- Powell R.A. and Single H.M. (1996). Focus groups. *International Journal of Quality in Health Care* 8 (5): 499-504.
- Poynter, R. (2010). *The handbook of online and social media research*. Chichester, West Sussex, U.K.: Wiley.
- Pyle, L. (2010). *How to Do Market Research--The Basics*. *Entrepreneur*. Retrieved 25 April 2016, from <https://www.entrepreneur.com/article/217345>
- Rollnick, S., Miller, W.R. and Butler, C.C. (2007). *Motivational Interviewing in Health Care: Helping Patients Change Behavior*, *The Guilford Press*, New York, NY.
- Saad, N., Hassan, S., & Shya, L. (2015). Revisiting the relationship between internal marketing and external marketing: The role of customer orientation. *The Journal Of Developing Areas*, 49(3), 249-262.
- Saunders, M., Lewis, P., Adrian, T. (2007). Collecting primary data using semi-structured, in-depth and group interviews (4th ed.). *Research methods for Business Students* (pp. 310-344). Harlow, England, UK: Pearson Education Limited.
- Sedighi, M., Mokfi, T., & Golrizgashti, S. (2012). Proposing a customer knowledge management model for customer value augmentation: A home appliances case study. *Journal Of Database Marketing & Customer Strategy Management*, 19(4), 321-347.

Sergeeva, A. & Andreeva, T. (2014). Knowledge Sharing Research: Bringing Context Back In. *Journal Of Management Inquiry*.

Shapiro, B. (1988). What the hell is 'market-oriented'. *Harvard Business Review*, 66, 19-25.

Tseng,S, Wu.P (2014). The impact of customer knowledge and customer relationship management on service quality. *International Journal of Quality and Service Sciences*, Vol. 6 Iss: 1, pp.77 – 96.

Sigala, M. (2012). Social networks and customer involvement in new service development (NSD): the case of www.mystarbucksidea.com. *International Journal of Contemporary Hospitality Management*, Vol. 24 No. 7, pp. 966-90.

Sincero, S. (2012). *Types of Survey - Different methods used when conducting surveys*. *Explorable.com*. Retrieved 25 April 2016, from <https://explorable.com/types-of-survey>

Slater, S. (1997). Developing a customer value-based theory of the firm. *J. Of The Acad. Mark. Sci.*, 25(2), 162-167.

Stebbins, R. (1997). Lifestyle as a generic concept in ethnographic research. *Quality and Quantity*, Vol. 31 No. 4, pp. 347-60.

Strategyzer | Value Proposition Canvas. (2016). *Businessmodelgeneration.com*. Retrieved 25 April 2016, from <http://www.businessmodelgeneration.com/canvas/vpc>

Koo.T, Peng.J, Lawrence.A. (2009). Customer knowledge management in international project: a case study. *Journal of Technology Management in China*, Vol. 4 Iss 2 pp. 145 – 157.

Trochim, W. (2006). *What is the Research Methods Knowledge Base?*.

Socialresearchmethods.net. Retrieved 25 April 2016, from

<http://www.socialresearchmethods.net/kb/index.php>

Use 'Customer' Brainstorming To Shape Your Business Vision, and Websites Will Write Themselves. (2009). *Think Around Corners*. Retrieved 25 April 2016, from

<http://www.thinkaroundcorners.com/2009/12/customer-brainstorming-helps-shape-your-business-vision-and-websites-write-themselves/>

Dimitrova.V, Kaneva.M, Gallucci.T, (2009). Customer knowledge management in the natural cosmetics industry. *Industrial Management & Data Systems*, Vol. 109 Iss. 9 pp. 1155 – 1165.

- Wang, H. and Yu, Z. (2010). The research of customer knowledge management in CRM. Proceedings of International Conference on Intelligent Computation Technology and Automation; 11–12 May, Changsha, China: IEEE Computer Society.
- Wayland, R. & Cole, P. (1997). *Customer connections*. Boston, Mass: Harvard Business School Press.
- Webster, F. E.. Jr. (1992) The Changing Role of Marketing Within the Corporation, *Journal of Marketing*, 5 (6, October) : 1-17.
- What is Agile Software Development? - Agile Alliance | Agile Alliance*. (2015). *Agile Alliance*. Retrieved 25 April 2016, from <https://www.agilealliance.org/agile101/what-is-agile/>
- Woodruff, R. B. (1997). Customer Value: the next source for competitive advantage, *Journal of the Academy of Marketing Science*, 139-153.
- Yin, R. K. (2009), *Case Study Research: Design and Methods* (Beverly Hills, Calif.: Sage).
- Young, R. (2010). *Knowledge Management Tools and Techniques Manual* (1st ed.). Tokyo: APO. Retrieved from http://www.apo-tokyo.org/00e-books/IS-43_KM-Tools_and_Techniques_2010/IS-43_KM-Tools_and_Techniques_2010.pdf
- Zack, M. (2003). Rethinking the knowledge based organization. *MIT Sloan Management Review*, 44 (4), 67–71.
- АББ в России - технологии для энергетики и промышленности | АББ*. (2016). *New.abb.com*. Retrieved 25 April 2016, from <http://new.abb.com/ru>
- Глубинное интервью*. (2016). *Infowave.ru*. Retrieved 25 April 2016, from http://www.infowave.ru/lib/methods/deep_interview/
- Гончаренко, (2016). *Как бизнесу не проспать вспышку мессенджеров — советы директора по развитию «Планфикс»*. *vc.ru*. Retrieved 25 April 2016, from <https://vc.ru/p/planfix-messengers>
- Миссия и ценности*. (2016). *Digdes.ru*. Retrieved 25 April 2016, from <http://digdes.ru/about/mission>
- Муравский.Д.В, Алканова.О.Н., Смирнова. М.М. (2013). Оценка восприятия брендов потребителем, производителем и инвестором: развитие представления о капитале бренда. *Вестник С.-Петербург. ун-та. Сер. Менеджмент*. 2013. Вып. 3.

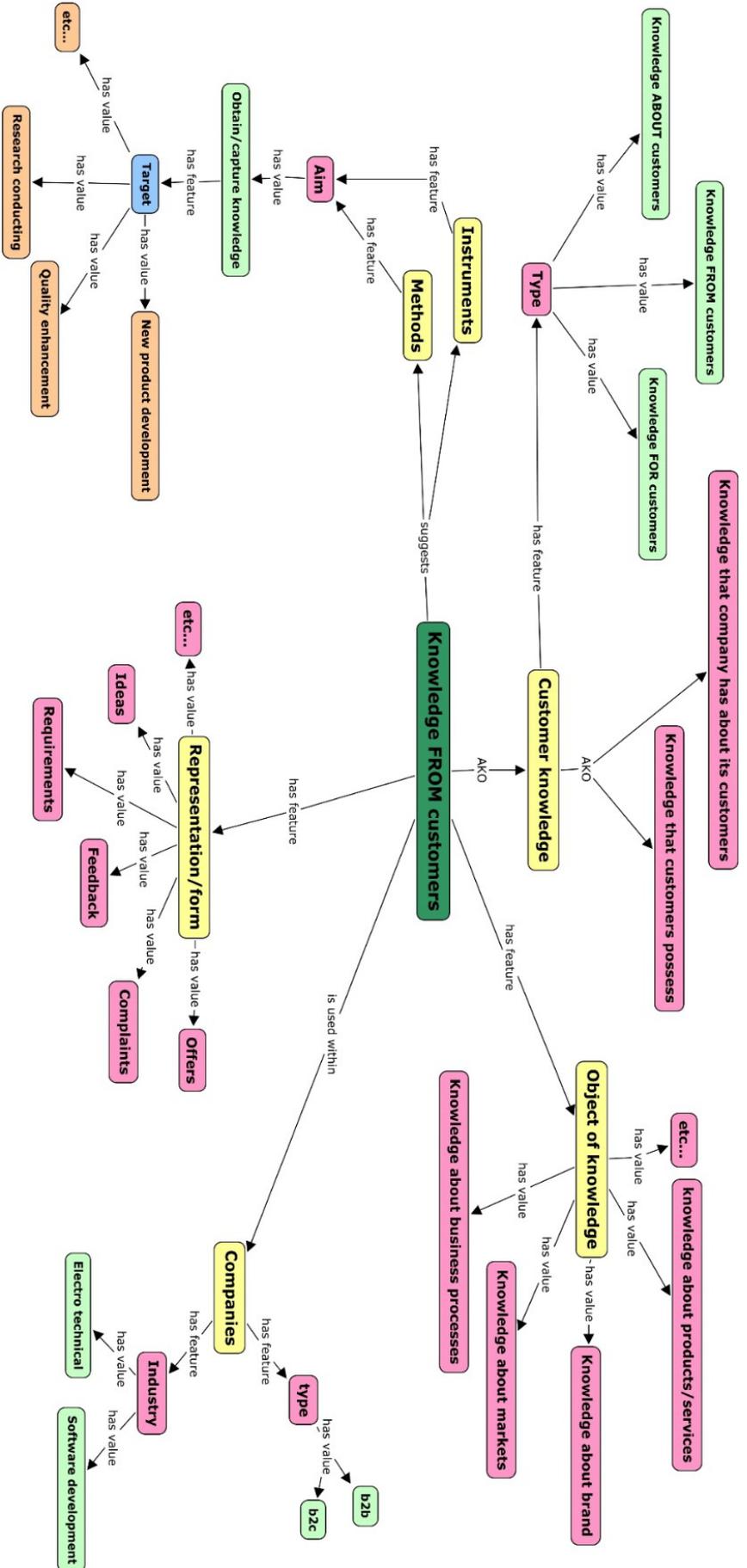
О компании Hilti - Hilti Россия. (2016). *Hilti Russia*. Retrieved 25 April 2016, from <https://www.hilti.ru/company/about-hilti/hilti-at-a-glance>

О компании. (2016). *Корпоративный сайт DataArt*. Retrieved 25 April 2016, from <http://www.dataart.ru/company/>

Основная информация | T-Systems Россия. (2016). *T-systems.ru*. Retrieved 25 April 2016, from <http://www.t-systems.ru/about/main-info/1151400>

Сведения о компании - Schneider Electric Russia. (2016). *Schneider-electric.ru*. Retrieved 25 April 2016, from <http://www.schneider-electric.ru/ru/about-us/company-profile.jsp>

APPENDIX
Appendix 1. The
concept of work



Appendix 1.1: Electrotechnical industry. Company A

Company A is a large electrotechnical company with rich history (Founded in XIX) operating in energy management solutions, automation of production processes, backup power systems solutions, solar energy solutions and almost all equipment connected with electricity distribution, usage, consumption and control. According to Company A program for the 2015-2020 period (2014), the major aims of the strategy are focused on bringing more value to customers and partners, reaching them efficiently and improving customers' life; simplifying operations and increase in efficiency, etc.

The interviewee was Kirill, channels marketing manager.

Company description	Large electrotechnical company operating in energy management solutions, automation of production processes, backup power systems solutions, solar energy solutions and almost all equipment connected with electricity distribution, usage, consumption and control. In Russia, company A has a wide network of customers and partners: leading Russian and international companies operating in Russia. Possess 6 production plants in Russia
Number of employees	170000 around the world; 12000 in Russia
Revenue, 2015; € bln.	26.6
The country of origin	France
Company's strategy for Russian market	Localization of products, small and medium niches of market penetration
Level of maturity (adopted from CMMI)	3th-4th
Management style, organizational culture	French chairman: international standards of management + several adaptations for Russia Innovation driven organizational culture, focus on learning and talent retention

Table 2. Company A basic information. Source: Company A Annual Report, 2014

Context	Management Style	Stakeholders	Forms of Knowledge	Types	Application/goals	Instruments and methods of capturing knowledge from
Localization of products, small and medium niches of market	French chairman: international standards of management + several adaptations for Russia for Innovation driven organizational culture, focus on learning and talent	Distributors + Retail+Final	Insights, Requirements Feedback,	Market knowledge, Product knowledge, Business Process	Market research, Quality enhancements, Product localization, Customer satisfaction	"Platforming" (Questionnaires, Annual and surveys based); Call centers; Sentiment analysis; A/B tests; Focus Groups; Feedback in Mobile Apps; E-mail distribution asking for feedback; Feedback forms on web-sites; Design Thinking tools
		Manufacturers Industry		Product knowledge, Business Process	Quality enhancements, NPD, Customer	Focus groups, Brainstorming (Workshops + Prototyping), "Test-drives" (trial operation); analysisContent
		Engineering centers (design)		Product knowledge (requirements and standards for	Product localization	
		Designers, Architects,		Business Process knowledge, Product	NPD, Product Design, Product	interviewsBlogs,

Figure 6. 4W context-driven framework for selection of instruments and methods for company A

First company that was contacted with is company A, representative of electrotechnical industry. The interviewee was Kirill, channel marketing manager. Company A is a large electrotechnical company operating in energy management solutions, automation of production processes, backup power systems solutions, solar energy solutions and almost all equipment connected with electricity distribution, usage, consumption and control.

According to Kirill, the company A is almost Russian company, because it employs a significant number of employees and invests a lot into creation of personal production plants, aiming in its strategy for Russia on production localization. “Absolutely. Localization, in a word is our strategy in Russia” — Kirill said. What is more, he also stated that now company is trying to penetrate to small and medium niches of electrotechnical market, where only relatively small Russian companies are presented.

As it is, the first type of knowledge that company A obtains is market knowledge. It suggests information about market trends, insights, competitors, etc. In order to collect this type of knowledge, company A “uses” its customers, distributors in this case. Product managers that are responsible for capturing market knowledge do the following: they contact distributors and ask them to participate in so-called “Platforming”, annually or quarterly conducted survey, where company A receives all needed market knowledge from distributors. Another instrument is partner portal, where all types of distributors or possible customers are allowed to provide feedback, ideas and insights from the market. “Partner portal is organized in a way that suggests customers leave comments, provide market insights, information about their business in a simple way. We use a gamification approach, motivating distributors to share their knowledge by providing discounts and other tasty benefits” — Kirill said.

Second type of knowledge that company A obtains is product knowledge. As it is seen from the figure above, all types of customers are contacted in order to receive product knowledge. First, distributors and retailers sometimes take part in product localization process and always take part in customer satisfaction analysis. Company A uses special surveys and questionnaires, focus groups for this purpose; use design thinking tools as a part of Customer Journey mapping, the process of identifying and analyzing the life cycle of the client. What is important, as distributors sell products to final customers, the latter use special feedback forms on company’s A website, use call centers in order to ask and provide feedback. Kirill also noted that even mobile applications feedback is used for capturing feedback from final customers. However, company A also serves large companies in special complex products or even production automation projects, energy management projects, etc. Kirill calls such customers Industry customers. It is obvious that complex products and projects require precise knowledge

about product that customer wants. However, business process knowledge and technology knowledge also play important role in such cases. Moreover, in order to know the requirements, features, ideas to add to new product, company A uses content analysis (analysis of documents with customer requirements and business processes), organizes focus groups, brainstorming sessions (in a form of a workshop) where requirements and features of new product are being discussed. What is more, company A sometimes uses “test drives” or trial operation periods, where customer may try the product and then provide feedback about interim product using special questionnaire with open questions. Here it is crucial to mention that new product development is used only for Industry customers, because they need personal, complex product. While distributors sell mostly mass products that are mostly localized for Russian market and product development role here is absent, (internal global R&D department is responsible for NPD).

Last, but not least is non-direct customer, design institutions or engineering centers (проектные институты in Russian). In order to make products localized, company A needs to know formal requirements and specifications for these products to be certified on the Russian market. The way in which company A captures this type of knowledge is simultaneously simple and hard. “We interview engineering center representatives in order to consider specifications. However, sometimes it happens in Russia unfortunately, there is no concrete unified and agreed specifications and the author faced a situation where several engineering center` representatives were arguing about requirements and specifications because they were not formalized for one type of product” — Kirill admitted.

And designers, architects and integrators are also non-direct customers who may advice final customers what electricity gadgets and products can be installed. Of course, company A wants its products to be advised by designers and architects. Therefore, company A conducts 2-way knowledge transfer, teaching them and obtaining insights in that field from designers and architects. “They are not our primary or direct customers, of course. Mostly partners. However, they can be really influential for design of products, localization or even NPD” — Kirill noted. For contacting them, company A uses blogs and interviews.

Summing up, company A uses different instruments and methods of capturing knowledge from customers, focusing mostly on surveys, questionnaires, focus groups, brainstorming sessions with extra usage of other instruments and methods mentioned in a figure above. The knowledge that captured is mostly product knowledge, market knowledge, and business processes knowledge. Aims for collecting knowledge from customer differs, but mostly it is

product localization, quality enhancements, and customer satisfaction measurement and market research purposes.

Appendix 1.2: Electrotechnical industry. Company B

Company B is one of the world leaders in provision of electro instruments and tools for construction industry. The main customers are construction companies. The company B states in its annual report that it excels outstanding innovation, superior quality and direct customer relations. Founded in 1941, now the number of employees exceeds 20000. Company possesses its own production plants and R&D centers in Europe and Asia. The company B has clear mission on satisfying all its stakeholders' needs: customers, suppliers, employees. As for Russia, company B has a rather small team of 700 people working here, but relatively significant 20 years of operations. Company's B strategy for Russian market is "becoming a recognized leader in supplying of high quality, specialized tools and installation systems for professional uses in construction and building maintenance industries" (Source: company B web-site). What is more, company B states it is customer driven and strives to be the best partner for its customers, while aiming to achieving significant and profitable growth.

The interviewee was Zuzana, HR Director of company B.

Company description	Company B is one of the world leaders in provision of electro instruments and tools for construction industry
Number of employees	>20000; >700 in Russia
Revenue, 2015; € bln.	3.94
The country of origin	Lichtenstein
Company's strategy for Russian market	Differentiation leadership, Localization
Level of maturity (adopted from CMMI;1 to 5)	5
Management style, organizational culture	"Think global, act local", Culture is based on commitment, integrity, responsibility, trust, tolerance and respect for others (Source: company B web site)

Table 3. Company B basic information. Source: Company B Web site, 2016

2W		3W	4W		5W	Instruments and methods of capturing knowledge from
6S	Management Style,	6S	Forms of 6S	6S Types	6S Application/goals	
Localization of products, differentiation	“Think global, act local”; Culture is based on commitment, integrity, responsibility, trust, tolerance and respect for	Maintenance, construction industry companies (b2b)+ Final users products of	Insights, Feedback,	Market knowledge, Product knowledge, Business Process	Quality enhancements, Product localization, NPD,	Focus groups, Brainstorming sessions, Surveys, Interviews, "Test Drive"; Call Webinars centers;
					Market research; Internal business processes	Third
					Customer satisfaction	Survey (Customer Care), Social Network Services; E-mail distributions asking for feedback; Feedback forms on web sites:
				tionProduct		
	Engineering centers (design					

Figure 7. 4W context-driven framework for selection of instruments and methods for company B

Second company the author contacted with was company B, representative of electrotechnical industry. The interviewee was Zuzana, HR Director. Company B is a one of the world leaders of electro instruments supply for construction and maintenance industries, therefore company B is a bright representative of electrotechnical industry.

Zuzana said that company B is slightly focused on customer. That is why customer feedback and satisfaction plays an important role. The company strives to be leader in Russia in the field of electro instruments provision for construction and maintenance companies by localizing its production for Russian market and differentiating it also in order to provide the best customer experience, quality and satisfaction.

In order to do it, company B communicates with two types of customers: direct ones — construction and maintenance companies and non-direct — engineering centers or design institutions. “Important things is we use direct sales and close cooperation with our customer. That is why we have special technical consultants who are closely connected with customers and during their communication they receive feedback from the customer” — Zuzana said. This point explains why the company uses a small amount of instruments and methods of capturing knowledge from customers.

Non-direct customers, such as engineering centers are just contacted and interviews with its experts are being conducted. This is done in order to clarify product requirements and standards due to successful product certification process that is crucial for Russian market localization.

Direct customers, such as construction companies are really involved in knowledge transfer. Company B uses broad variety of instruments to capture knowledge from them. First of all, focus groups with customer company representatives are conducted where features of product are discussed whether they are appropriate or not. For special purposes, e.g. complex orders, new customized products, brainstorm sessions are also conducted in order to generate all possible ideas that can be implemented for new product. Second, surveys and interviews with customer representatives are also conducted.

Sometimes, company B organized special webinars where presents its new products or prototypes and demonstrates their performance. During webinars, customers are allowed to offer ideas, provide feedback, etc. It offers company ways of product quality enhancements and overall customer opinion about new product. Besides webinars, so called “test drives” can be organized, where after product test, customer provides company B with feedback for product quality enhancements.

For market research purposes, company B needs market knowledge. That is why in order to learn the market trends, customer needs, insights, and conduct competitor analysis, company B orders market research from third party research providers.

Finally, as customer satisfaction is highly appreciated within the company, it uses a lot of instruments and methods in order to measure it. Special customer care surveys are distributed between customers quarterly. Survey helps to identify whether the customer is a “fan” of company’s B products or not and identifies customer satisfaction index. Of course, basic tools such as e-mail distributions asking for feedback and feedback forms on company’s B web site are included in the list of instruments that are used for customer satisfaction analysis.

Zuzana said that call centers are also used, but sometimes for a quite interesting reason, for internal quality of business process enhancement. However, call centers are not designed specially for this purpose, but they faced the situations where due to feedback that was received from call center they improved their internal processes. Therefore, call center as an instrument can be useful for feedback collection too.

Summing up, company B uses variety of instruments and methods of capturing knowledge from customers, focusing mostly on surveys, focus groups, brainstorming sessions. However, they use “test drives”, webinars and call centers as well. The knowledge that captured is mostly product knowledge. Aims for collecting knowledge from customer differs, but mostly it is new product development, product quality enhancements, and customer satisfaction measurement and market research purposes.

Appendix 1.3: Electrotechnical industry. Company C

Company C is a leading supplier of power equipment and technologies for power industry, transport, and infrastructure and production automation, so is a bright representative of electrotechnical industry. Company operates in more than 100 countries all over the world. Company has a rich more than 120-year history. One of the distinctive features of the company is its R&D centers that provide superior technologies that allow company to be one of the leaders in its business. Today company C serves as the largest manufacturer of industrial motors and drives, wind power generators, as well as a major supplier of electrical networks around the world. Company C is a direct competitor of company A in the following markets: automation of production processes, electric networks, and electrics in general.

The interviewee was Oleg, Marketing director for Russia and CIS countries.

Company description	Leading supplier of power equipment and technologies for power industry, transport, and infrastructure and production automation, so is a bright representative of electrotechnical industry. Company operates in more than 100 countries all over the world. Company has a rich more than 120-year history
Number of employees	>135000; >1100 in Russia
Revenue, 2015; € bln.	31.63
The country of origin	Sweden/Switzerland
Company's strategy for Russian market	Providing best products considering Russian market requirements
Level of maturity (adopted from CMMI;1 to 5)	4
Management style, organizational culture	Independent form international office, with Russian specifics.

Table 4. Company C basic information. Source: Company C Web site, 2016

4W		3W	2W		1W	Instruments and methods of capturing knowledge from
Who	Management Style,	Where	Forms of Knowledge	Knowledge Types	Why Application/goals	
Providing best products considering Russian market	Russian influences on organizational culture and Russian management; Customer satisfaction re-driven	Distributors + Retail+Final	Insights, Feedback,	Market knowledge, Product	Customer satisfaction measurement, quality	Surveys, call centers, feedback forms, sentiment analysis, focus
		Industry		Product knowledge, Business Process	NPD, Quality enhancements, Customer satisfaction	Brainstorming, "Test-drives" (trial operation); NPS surveys; surveys for collection requirements
		Engineering centers (design)		Product knowledge (requirements and standards)	Product	
		Designers, Architects,		Product	NPD (design, features,	blogs Interviews,

Figure 8. 4W context-driven framework for selection of instruments and methods for company C

The third company from electrotechnical industry that was contacted was company C. Company C is a direct competitor of company A and specializes in energy management solutions, electricity network, production processes automation, etc.

According to Oleg, clients of the company can be separated by two categories: direct and non-direct ones. What is more, final customers (people) are mostly influencers and can be considered as non-direct ones here.

Direct customers include distributors, resellers and large industry companies that order complex projects for their business. Oleg mentioned large oil, energy, telecommunication and maritime companies as industry customers. Knowledge from direct customers can be used for several purposes: distributors are contacted for receiving feedback of sales, final buyer satisfaction level and large industry customers provide knowledge of the projects, products in order to NPD and quality enhancements.

Non-direct customers that include mostly influencers are the following: final buyers, engineering centers or design institutions and designers, architects, integrators. Therefore, the same as company A has. Knowledge from final buyers is necessary for customer satisfaction analysis and quality enhancements, while knowledge from engineering centers or design institutions is required for product localization or development. Final buyers are being surveyed, focus groups are also used. In order to capture these requirements company C as company A uses direct contacts with engineering centers' representatives or just conducts interviews with them. Designers and architects provide company C with important insights of trendy products features, design and this knowledge is used in NPD. In order to communicate with them and receive knowledge, company C uses special events, web-site, personal interviews and visits.

As for type of knowledge that company C captures, there are product knowledge and project knowledge that actually combines product knowledge, business process knowledge and technology knowledge; and market knowledge.

As it was already mentioned, the applications or aims of using knowledge from customers that company C captures are different. They include NPD, where company C uses special surveys for initial requirements gathering for new products. Focus groups are used with final buyers, because the results are used for development of quite simple products, such as power sockets and the captured result goes to production place of company C. For complex projects, company C uses brainstorming sessions with industry customers' representatives.

Another application of knowledge from customers is quality enhancements. In this case, company C uses contact centers for gathering feedback and suggestions with ideas of improving the product. “All information from call centers and emails that we receive goes to our Salesforce CRM, where it is stored and can be analyzed later” — Oleg said. However, CRM system here is not an instrument of capturing knowledge, but an analytical tool of managing knowledge, so the author does not consider CRM system as an instrument of capturing knowledge from customers in this case and in my thesis in general. As well as contact centers, feedback forms on company’s web site are used for capturing feedback and collect ideas from final buyers or customers. For industry customers, special “test drives” or trial operations period is used, when subsequently customer provides feedback and improvement suggestions if so.

Another application of knowledge from customers is customer satisfaction analysis. For that purpose company C uses different tools. For example, questionnaires for final buyers in sales place, online questionnaires. Special NPS surveys for direct customers are also used for measuring their satisfaction level. Oleg mentioned that sentiment analysis is used by company C, but for narrow application. “We use it mostly like a toy unfortunately. Analyzing mentions and opinions about our products is used for anti-crisis management, in order to know what measures to take in order to solve occurred problem and decrease dissatisfaction” — Oleg said.

To sum it up, company C uses variety of instruments and methods of capturing knowledge from customers, focusing mostly on surveys, questionnaires, call centers, brainstorming sessions. However, they use “test drives”, interviews and feedback forms on their web site. The knowledge that captured is mostly product knowledge and business process knowledge (for large industry customers). Aims for collecting knowledge from customer differs, but mostly it is new product development, product quality enhancements, and customer satisfaction measurement.

Appendix 1.4: Software development industry. Company D

Company D is one of the leading Russian IT companies. Its major in automation of business processes, portal solutions, custom software development. According to company's D web site, company formed in 1992 in Saint-Petersburg. Since 1992, it realized more than 2,000 projects for companies operating in various business sectors: construction, trade, insurance, transport, as well as state organizations.

As for strategy, the respondent, Andrey, portal solutions director, told that it is dynamic and there is a change or shift in strategy takes place every year in order to adapt to changing market environments. However, now the key aim of company D is typification and duplication of company services for broad market.

Company D employs around 500 employees.

Company description	One of the leading Russian IT companies. Its major in automation of business processes, portal solutions, custom software development
Number of employees	~500
Revenue, 2014; € mln.	12.7
The country of origin	Russia
Company's strategy for Russian market	Typification and duplication of company services for broad market
Level of maturity (adopted from CMMI;1 to 5)	3
Software development approach	Classic, non-agile; waterfall

Table 5. Company D basic information. Source: Company D Web site, 2016

Development			Forms of	Types of	Application/goal	Instruments and methods of capturing knowledge from customers
Typification and duplication of company's services to broad market	Non-agile;	Large companies, state	Requirements, Feedback, Opinions,	Product requirements (and product knowledge);	DN	Interviews, Content analysis; groups Focus
				Business process	Quality	"Test drive" (trial operations period):
					Customer	
					Beginning of relations with	Interviews; Questionnaires;
				Market	Market research (probable needs of current and former	
					Market research (collection of opinions and insights of product)alpha	Seminars/webinars; design tools thinking

Figure 9. 4W context-driven framework for selection of instruments and methods for company D

The company strategy in typification and duplication of companies' services to broad market. What is more, the strategy is dynamic and every year it changes due to aim change and environmental factors.

The main customers of company D are large industry companies (Enterprise class, according to Andrey) and state organizations.

Andrey has not paid attention to separation of clients, because instruments and methods used are the same for governmental and non-governmental companies.

However, the important thing is the methodology of software development, that the author used in Where? Dimension instead of management style and organizational culture, because afterwards the author recognized that among IT companies it is senseless. Therefore, company D has non-agile, quite documentation-saturated approach or methodology to software development. Andrey said that each iteration is documented and next one starts after the latter is finished.

Company D uses knowledge that its customers possess. As for forms of knowledge, company D uses requirements for services, feedback, opinions, and thoughts. However, types of knowledge are different and include product/service requirements (as a part of product/service knowledge); market knowledge and rather important business process knowledge.

The major aims or application of using knowledge from customers are new product development, quality enhancements of company's services and product and market research purpose.

Andrey itemized the software development process on the following stages: pre-sales, analytics and survey, development, trial operation, commercial operation.

On the first iteration, company D identifies initial requirements, budget for development. In order to capture this knowledge, company D uses special questionnaires and interviews.

Next stage is analytics and survey stage, where company D prepares documents and analyses customer documents, therefore uses content analysis. Moreover, personal contact with customer and its representatives takes place: company D conducted focus groups and uses interviews in order to formalize final requirements for new service or product.

Next stage is development itself and customer may monitor this process and provide developers with feedback using special tracking systems where feedback is stored and classified

as tasks to be solved. Task trackers are used for service quality enhancements during development process.

When the alpha version is ready, company tests it itself and later organizes “test drive” or trial operation period for customer; customer tests the service and provides the company D with useful thoughts and feedback that is used for service quality enhancements.

“When the final product is commercially operated by our customer, we use online surveys for identifying customer satisfaction level” — Andrey said.

Another application of knowledge from customer in company D is market research. It can be organized for 2 specific aims: identifying possible needs of former or current customers and collection of opinions and insights from potential customers when new service prototype is presented by the company. In first case, company D uses online questionnaires and in the latter case organizes seminars and webinars where potential customers may provide feedback, insights and ideas according new prototype`s features, functions and other characteristics. Sometimes they use design thinking for visualize their knowledge.

To sum it up, company D uses different instruments and methods of capturing knowledge from customers, focusing mostly on surveys, questionnaires. However, they use “test drives”, interviews, seminars/webinars, and design thinking tools. The knowledge that captured is mostly product/service requirements and business process knowledge, and sometimes market knowledge. Aims for collecting knowledge from customer differs, but mostly it is new product development, product quality enhancements, and customer satisfaction measurement and sometimes market research for new perspectives and possibilities among former and current customers.

Appendix 1.5: Software development industry. Company E

Company E is a subsidiary of one German large telecommunications company. According to company's E web site, the main business directions of company E are the following:

- Development, integration and support of software
- Implementation and support of SAP ERP enterprise management systems
- Cloud services
- Telecommunication services

Company E employs around 1100 employees in Russia and more than 47000 worldwide. As for revenue for 2015, company's E revenue amounts 8.6 €bln.

Company's E solutions combine German reliability and relevance of the Russian customers' needs. Clients of company E in Russia are large companies from retail, oil&gas, transportation, logistics, machinery, automotive industries and state organizations.

The interviewee was Mikhail, senior projects manager of company D.

Company description	International IT company, specializing in software development, implementation and support of ERP systems, cloud services and telecommunications services
Number of employees	47000 worldwide, ~1100 in Russia
Revenue, 2015; € bln.	8.6
The country of origin	Germany
Company's strategy for Russian market	Talent acquisition (according to Mikhail) and reaching leading positions on Russian It market (web site of company E)
Level of maturity (adopted from CMMI;1 to 5)	4
Software development approach	Depends on project (but in Mikhail's case-Agile)

Table 6. Company E basic information. Source: Company E Web site, 2016

Who		Why	What		Where	Instruments and methods of capturing knowledge from customers
Who	Development	Why	Forms of	Types of	Application/goal	
Being an attractive employer; talent	Depends on project (Mikhail's project-)	Large companies, state	Requirements, Feedback,	Product requirements (and product knowledge); Business process	DN	Brainstorming sessions; Focus groups
					Quality	"Test-drive" (trial operations Wiki period);
					Customer	Questionnaires;
					Communication between	Messengers,

Figure 10. 4W context-driven framework for selection of instruments and methods for company E

Company E is technology driven company and according to Mikhail, serves mostly European companies. Moreover, Russian market is only used as a good source of comparatively cheap developers. That is why outsourcing plays important role in company E business on Russian market.

It was hard for the author to form an impression about company E, because Mikhail told only about his project, however company has around 100 projects currently and the situation can be different among other projects.

As for clients, there are large European and sometimes Russian companies from different industries, for example, Mikhail's project is from transportation industry (railroads).

Because the approach to software development is agile, personal communications and small amount of bureaucracy and documents flow take place.

According to Mikhail, company E contacts with representatives of customer companies and tries to receive requirements that can be used for new service or product development. It is done by using brainstorming sessions with companies' representatives, content analysis of documents coming from customers and using special issue tracking systems or task trackers. Tracking system is "a computer software package that manages and maintains lists of issues, as needed by an organization". These tracking systems are used when company E contacts with business analysts and architects of customer company in order to learn about existing software and systems. It allows them to dismiss unnecessary functions in new product.

Requirements gathering is organized by using interviews as well.

Trial operations period or "test drive" also takes place when another stage of product or service development is finished. Customer representatives try it on and later provide company E with a feedback. What is more, task trackers are also used there in a form of Wiki in order to collect coming feedback and analyze it further. Company E uses Confluence software for Wiki and stores there information coming from customers as well. Therefore, uses it as a knowledge base.

"Task trackers are used quite versatile in our project and company as well"— Mikhail said. Even communication between company E representatives and customer representatives are conducted via task trackers, such as JIRA. What is more, messengers are used for fast communication and knowledge share between company and customers. Agile methodology influences all processes of development in order to make it faster and more flexible, that is why

communication and capturing knowledge from customers organized in company E is simple and mostly about personal contacts.

For customer satisfaction level identification company E uses questionnaires.

To sum it up, company E in many cases uses agile methodology (as in Mikhail's project), that is why the process of communication and knowledge capturing from customers require more personal communication and less documents. That is why, company uses not too many instruments and methods of capturing knowledge from customers, and used ones are oriented on personal contact: brainstorming sessions, interviews, messengers. Issue tracking systems of task tracker software is used for the majority of other purposes, such as requirements and feedback gathering and analysis that includes in NPD and quality enhancements processes. As for knowledge types, company E mostly copes with product requirements or product knowledge. It is important to mention that facts mentioned above are used in Mikhail's project, but as for company E in general, there is a possibility that there will be differences in some dimensions of 4W context framework.

Appendix 1.6: Software development industry. Company F

Company F is a medium sized international IT company. Found in 1997 and simultaneously started to work in Saint Petersburg and in the US. Company F focuses on IT-consulting, custom software development and modernizing corporate information systems in the financial industry, telecommunications, health care, tourism, media and the Internet of things. The clients of company F are located in the US and the UK, while the development centers are situated in Russia, Ukraine, Poland and Argentina.

Company F web site states that company tries to minimize the number of intermediaries and unnecessary steps between the client and software developers, so company`s experts speak directly with the customer, which is unusual for such a business.

Company F has a special corporate culture: the lack of rigid hierarchy, bureaucracy, flexible working hours, and the system of corporate education. Company F is oriented on both customers and own employees. Therefore, the strategy of the company is providing its customers with best services, simultaneously developing its employees, and providing them the best conditions for work.

The interviewee was Alexey, business development manager.

Company description	Company F focuses on R&D outsourcing, custom software development and modernizing corporate information systems in the financial industry, telecommunications, health care, tourism, media and the Internet of things
Number of employees	~1700 worldwide
Revenue, 2015; € mln.	71
The country of origin	Russia/USA
Company`s strategy for Russian market	Providing its customers with best services, simultaneously developing its employees, and providing them the best conditions for work
Level of maturity (adopted from CMMI;1 to 5)	3
Software development approach	Agile

Table 7. Company F basic information. Source: Company F Web site, 2016

2W		3W	4W		5W	Instruments and methods of capturing knowledge from customers
6W	Development	7W	Forms of	Types of	Application/goal	
Being an attractive employer; talent	Agile-based	Large telecommunication companies; R&D companies; Financial Banking	Requirements, Feedback,	Product requirements(and product knowledge); Business process	DN	Content analysis, Wiki,
					mentsQuality	"Test-drive" (trial operations period); Wiki; Brainstorming
					Customer	

Figure 11. 4W context-driven framework for selection of instruments and methods for company E

Company F and Alexey, business development manager, my interviewee were really interesting and unusual in terms of answers and company facts and features. Company F, according to its web site states that it is extremely customer-oriented, prefers close relations, and likes flexibility in work. Alexey proved these facts by answering my questions.

First, he stated that the main thing among software development companies is an approach or methodology of development itself. And flexible approaches, based on Agile are used in order to get rid of bureaucracy and routine document work. In addition, “the more complex approach is, the more instruments are used, the more complex and risky will be the outcome”— Alexey said.

That is why, the description of company F and its instruments and methods of capturing knowledge from customer in terms of context of choosing and using differs from other presented companies.

Alexey said that company is interested in business process and technology knowledge in order to understand customer needs. Company F works only with foreign customers and almost every time there is no need of usage special instruments for capturing requirements of customer, because they are quite experienced and as Alexey mentioned: “they understand that IT is expensive and you should be prepared for collaboration with IT company in order to make the process easier and cheaper for you”. That is why customer requirements are often formalized and there is no need to use any instruments, except for content analysis that is a method of document analysis, where company gets knowledge from document with customer requirements. This knowledge is often stored in Wiki, where communication process between customer representatives and company F occurs.

What is more, Alexey noted that Agile approach suggests iterations and after each iteration customer receives some result. During this step, before passing service or product to the next iteration of development, company F organizes a test of product, or trial operation period, after which customers are required to share feedback in order to make quality enhancements. Moreover, Alexey mentioned that it is enough, because “constant close collaboration and communication makes knowledge capturing by itself. The main instruments in our company case are heads of our specialists”— Alexey stated.

As for customer satisfaction, Alexey mentioned that is obvious whether the customer is satisfied or not. And constant communication processes identifies these occurring issues.

To sum it up, the main instruments of capturing knowledge from customers are communications in forms of interviews, brainstorming sessions and trial operation periods with content analysis.

