St. Petersburg University Graduate School of Management

Master in Management Program

KNOWLEDGE MANAGEMENT SYSTEM DESIGN

FOR AUDIT AND CONSULTING COMPANIES

Master’s Thesis by the 2nd year student

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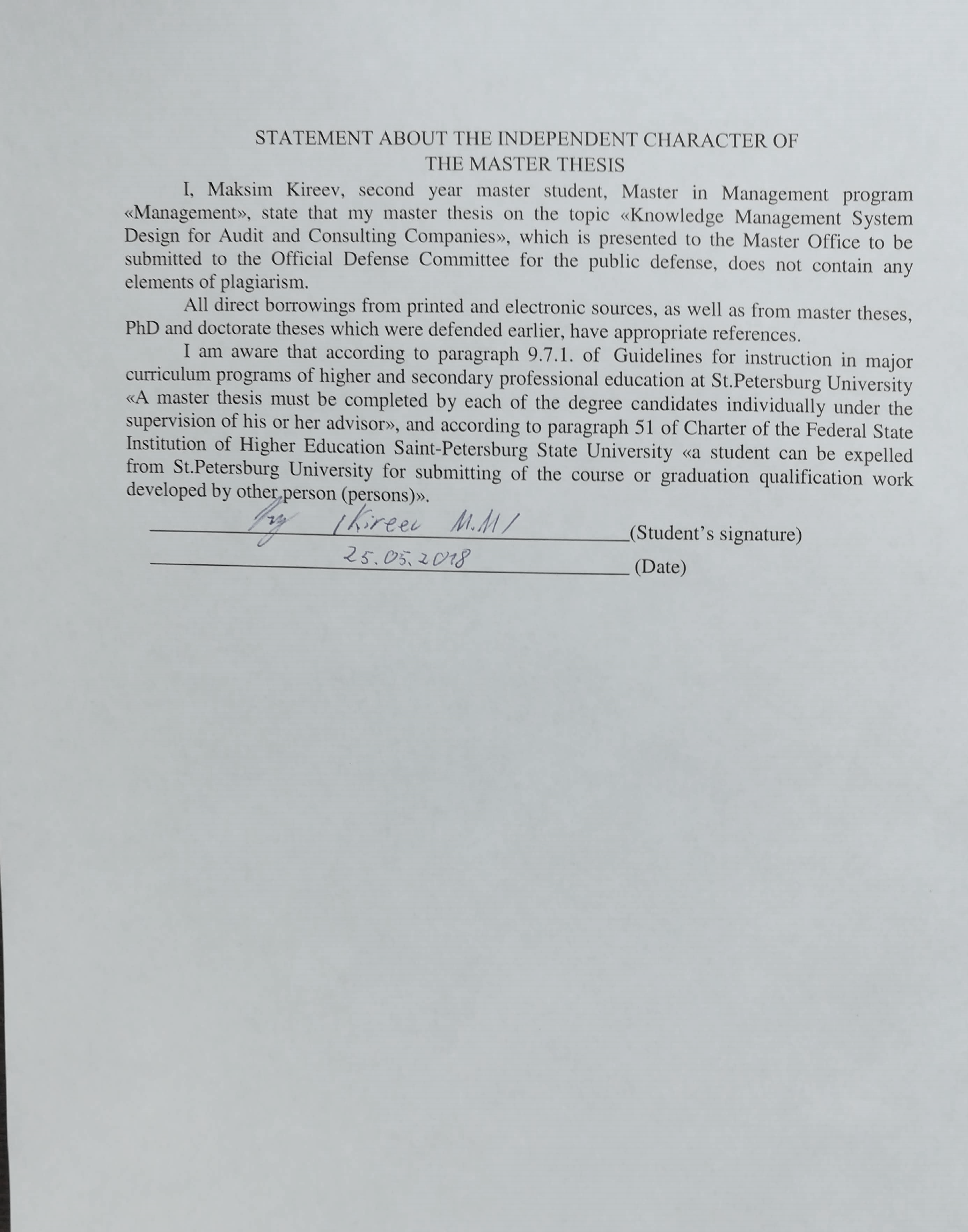
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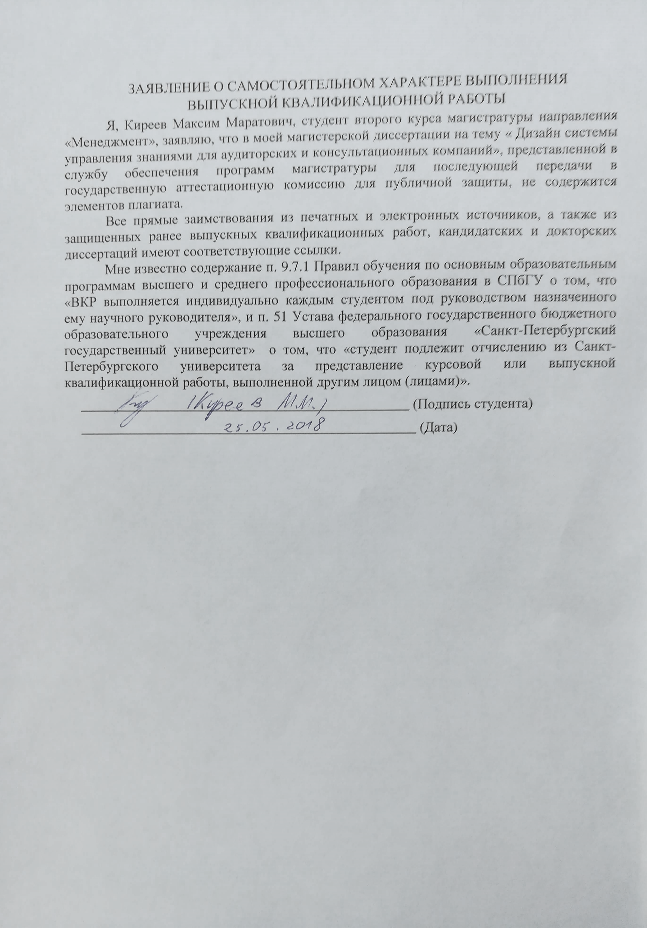
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АННОТАЦИЯ

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| Научный руководитель: | Гаврилова Татьяна Альбертовна. Профессор, заведующая кафедрой информационных технологий в менеджменте |
| Описание цели, задач и основных результатов: | Целью данного исследования является разработка модели системы управления знаниями для аудиторских и консультационных компаний. Данное исследование основано на анализе процесса оказания аудиторских услуг и 4 интервью с сотрудниками и менеджментом в аудиторских компаниях в Санкт-Петербурге, которые имеют опыт взаимодействия и управления аудиторскими услугами. В ходе исследования было выявлено 13 элементов системы управления знаниями. Данные характеристики были проанализированы на предмет определения их роли в системе управления знаниями. Для построения модели были проанализированы модели организаций из разных отраслей. Построенная модель проста для понимания сотрудников аудиторских и консультационных компаний и не требуют специальных знаний в области информационных технологий. |
| Ключевые слова | Аудиторские и консультационные компании, аудиторские услуги, модели системы управления знаниями, дизайн управленческих моделей |

ABSTRACT

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| Description of the goal,  tasks, and main results: | The goal of current research is to develop a model of a knowledge management system for audit and consulting companies. This study is based on an analysis of the process of providing audit services and 4 interviews with employees and management in audit companies in St. Petersburg that have experience in the interaction and management of audit services. The study identified 13 elements of the knowledge management system. These characteristics were analyzed to determine their role in the knowledge management system. To model the model, organizations from different industries were analyzed. The model is simple for understanding employees of audit and consulting companies and does not require special knowledge in the field of information technology. |
| Keywords | Audit and consulting companies, audit services, models of knowledge management system, design of management models |

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# **INTRODUCTION**

The concept of knowledge management systems (KMS) is not entirely new. Numerous researches, empirical and theoretical analyses have been published since the end of the twentieth century, each proposing a new or an improved methodology for implementing KMS, or initiating a discussion about its components, its nature, or justifying its contribution to the overall value of the company from the point of view of the value-based management.

Not surprisingly, not all industries have been studied in the light of the knowledge management. The dynamic nature of the market has created a competition among many companies, which led to a different view of the existing knowledge in term of capital used to create benefit for the customer and a competitive advantage over other companies. Focusing on knowledge management is critical for any industry, with audit and consulting companies, presented mainly by Big 4 and Big 3 companies, being no exclusion. Laws and regulations, industry forecasts, efficiency issues – this is very limited list of all issues related to knowledge management in those companies.

What kind of differences can arise in implementing KMS in audit and consulting companies? First, expertise in numbers of industries is required in order to be able to assess any judgmental finance decisions made by client. Knowledge creation might be another differentiator, since it might be the crucial part in deciding whether to use services of one or another company in the industry. In addition, knowledge sharing within and amongst teams that might play critical part while trying to complete projects in most efficient way possible.

My personal motivation combines both of theoretic fields of this work. I always had a huge interest in audit and consulting companies – I enjoy the idea of planning the career in some of the big4 companies. They create momentum and move forward world economies. That is why I feel it is so important to look for drivers that contributes to theirs’ growth. And KMS is something that got in my mind. Being familiar with process management, I think that KMS is something that requires a titanic amount of work but can save many resources in the end.

The aim of the current research is to design KMS model for audit and consulting companies, so that management of such companies could adjust their models to get more advantages for the company. The research is based on analysis of current knowledge management system, employees’ opinions about its efficiency and expert opinion regarding its adequacy and opportunities to improve the system. As a result, following research questions are going to be answered:

1. How does KMS model looks like in audit and consulting companies?

2. How employees evaluate effectiveness of KMS elements?

3. What can be done in order to improve the effectiveness of the model?

The research purpose will be fulfilled through completion of several tasks:

• perform analysis of existing KMS within audit and consulting companies and build the model based on appropriate framework;

• survey employees on different levels;

• assess model by discussion with expert.

The research has the following structure: the first chapter is focused on describing knowledge management systems; defining what the knowledge and KMS is, their peculiarities and how they are being used.

In the second chapter, the emphasis is put on describing research methods, description of elements of KMS model, performing surveys to assess effectiveness of KMS elements.

In the third chapter, the model is being assessed, based on survey results and expert opinion. This model purpose is to assist in improvements of KMS.

# **CHAPTER 1. THEORETICAL REVIEW OF KNOWLEDGE MANAGEMENT SYSTEMS**

* 1. **Knowledge concept definition**

Nowadays, the world is changing from the utilization of natural resources to the usage of knowledge. Business is moving away from oil, gas and woods to an era based on knowledge collected from R&D, competencies and learning (Friedman, 2005; Gulbranson & Audretsch, 2008). The basic good is not capital, natural resources or labor any more (Jelenic, 2011; Khan, 2014). Knowledge is truly one of the most important and valuable resource and good (Bhojaraju, 2005; Hegazy & Ghorab, 2014). Schultze and Leidner (2002) also mentioned that knowledge is becoming most valuable source in organizations. Logically, knowledge with skills to create and use it are perceived as a leading power to change world economy. Knowledge has been grew as main power of economic developing of enterprises in world economy, being the source of innovation (Carneiro, 2000; Kakabadse et al., 2003).

According to Shannon (Shannon, Weaver, 1963), "this is all that removes uncertainty about the outcome of an event." Summarizing the set of definitions, we can say that information is a collection of information that is perceived and processed by a living being or device and transmitted through signs (symbols, sounds, gestures).

The modern idea of ​​information allows it to be divided into three groups:

• content (soft structured heterogeneous mixture - letters, notes, photos, audio and video files, interviews, etc.);

• data (ordered tables, catalogs, etc.);

• knowledge (meaningful information).

The field of knowledge (Gavrilova, 1984) stated as some informal description of the basic concepts of the subject area and the connections between them. In the formation of the field of knowledge, the key issue is the very process of obtaining knowledge, when the competence of the expert is transferred to knowledge engineers. This process in the specialized literature has received several names:

• Acquisition;

• Knowledge capture;

• Extraction (elicitation);

• Discovery;

• Formation of knowledge, etc.

The term knowledge formation has traditionally been assigned to an extremely promising and actively developing field of knowledge engineering, which develops models, methods and algorithms for training. It includes inductive models of knowledge generation and automatic generation of hypotheses, for example, the DSM method (Anshakov, Skvortsov, Finn, 1986) based on training samples, training by analogy and other methods. These models allow identifying cause-and-effect empirical dependencies in databases with incomplete information containing structured numerical and symbolic objects (often in conditions of incompleteness of information).

It is emphasized that communication is not just a unidirectional process of transmitting messages and not a two-stroke exchange of pieces of information, but an undisclosed process of information circulation, that is, a joint search for truth (Kagan, 1988)

It is known that the loss of information in the course of conversational communication is a common thing (Mizic, 1987).

Traditionally, problems of forecasting, identification (synthesis) of functions, decoding of languages, inductive derivation and synthesis with additional information belong to the tasks of forming knowledge or machine learning (Epifanov, 1984). In a broad sense, learning methods can be referred to as examples of pattern recognition training (Atkinson, 1989). The formation of knowledge tending to a greater extent in the field of machine learning, i.e. inductive learning, is based on a well-researched pattern recognition models (Gajek, Gavranek, 1983) and the detection of similarities of objects (Gusakova, Finn, 1987), more recently called data mining or knowledge discovery (for more details, see below or in (Berry & Linoff, 2006).

Most specialists in cognitive sciences from neurophysiologists to linguists argue that the main feature of natural intelligence and memory in particular is the connection of all concepts to the network. Therefore, to develop the knowledge base, we need not the dictionary, but the "encyclopedia" (Schenk, Birnbaum, May, 1989), in which all terms are explained in the dictionary articles with references to other terms.

Thus, the linguistic work of a knowledge engineer consists in building such connected fragments by "cross-linking" terms. In fact, this work is a preparation for the conceptualization phase, where this "sewing" (according to Shenku-CPC, the conceptual organization of memory (Schenk, Hunter, 1987)) acquires some final form.

Careful work of the analyst and expert allows you to define hierarchies in conceptual structures. Such structures are of great epistemological and didactic importance, and in recent years a special term has been used for them - "ontologies" (Gruber, 1993; Guarino, 1995)

Knowledge can be described as information that people possess in their minds or former experience and ability to understand (Marwick, 2001; Alavi et al., 2005). Knowledge holds the information that is processed and ready to be used in decision-making process (Chang & Lin, 2015). Anand and Walsh (Anand & Walsh, 2016) stated that knowledge consists of information, expertise and skills. The main reason for knowledge sharing is to make it available for others, to demonstrate its importance for enterprises, motivate employees for exchange of knowledge, thus, develop the knowledge infrastructure (Merlo, 2016). Obviously, without a clear management knowledge can fail and become not effective and useless (Ansari et al., 2012; Karimi & Javanmard, 2014). Thus, enterprises has to develop a list of processes that will be able to manage existing knowledge (OuYang, 2014).

Numerous scientists have defined knowledge management in different ways. Knowledge management is the ability to manage knowledge in forms of collecting internal or external knowledge of enterprises, transforming it to innovative ideas or new strategies, utilizing this knowledge and protecting it (Gold et al., 2001). Lytras et al. (2002) described knowledge management as a systematic and explicit application of knowledge that aimed to help the enterprises to increase effectiveness related to the knowledge area and provide returns from existing knowledge assets. It as well build new opportunities, motivate toward innovation and performance that will result in increase customer value. From this perspective, knowledge management is a process of collecting, storing, sharing and using knowledge (Leidner et al., 2006; Chang & Lin, 2015). In addition, it can be stated as a systematical process for collecting, organizing and sharing tacit and explicit knowledge that belongs to employees and that can be used during their work (Schultze & Leidner, 2002; Alavi et al., 2005; Massey & Montoya-Weiss, 2006).

Enterprises can collect, store and use their knowledge resources by referring to knowledge management practices and technology solutions (Kankanhalli et al., 2005; Greiner et al., 2007). Therefore, the biggest goal for knowledge management is to help the organizations to know about existence of their knowledge and manage the knowledge to let them effectively utilize it (Newell et al., 2004; Alavi et al., 2005). Griffith et al (Griffith et al., 2003), Pawlowski, and Bick (2012) stated that the scientific meaning of knowledge for enterprises is still in its’ initiate stage. Four main elements build knowledge management (Kayworth & Leidner, 2003; Zaim, 2006; Fong & Choi, 2009; Turner et al., 2012):

1. Knowledge Creation. This element consists of collecting of new knowledge or changing the existing information within the enterprise’s explicit and tacit knowledge. It demands to look for new knowledge and information from both perspective, inside and outside analysis is required (Chen & Edgington, 2005; Carrion et al., 2012). Enterprises can obtain new knowledge by process of imitation, using benchmarks, replication or outsourcing (Abou-Zeid, 2002). Element of knowledge creation is important as it creates new knowledge in enterprise and it can be turned to become key for success and process of innovation (Bhatt, 2000; Malhotra, 2000). Knowledge can be created, shared and become bigger by collaboration operations in enterprises (Norman, 2004; Ajmal & Koskinen, 2008).

2. Knowledge Storage. Explicit and tacit knowledge created in enterprise should be stored. Organizations should operate and control the knowledge to make access to it easier (Massey & Montoya-Weiss, 2006; Heisig, 2009; Ling et al., 2009). Since the knowledge is utilized, it can decrease the redundancy and by this enhance efficiency (Alavi et al., 2005). Nemati (2002) also mentioned that knowledge storing is not just useful for effectiveness of utilizing but for ability to use it again as well.

3. Knowledge Dissemination. This element consists of sharing and exchanging knowledge among people or group of individuals, employees in enterprises and individuals to external sources (Alavi et al., 2005; Carrion et al., 2016). Following the process, enterprises has to be sure that the knowledge is restated from tacit knowledge to explicit to make sure that not a single part of tacit knowledge is lost (Ko et al., 2005; Massey & Montoya-Weiss, 2006; Eskerod & Skriver, 2007; Ajmal & Koskinen, 2008; Pirkkalainen & Pawlowski, 2013).

4. Knowledge Application: This element describes the usage of knowledge in correcting the strategy direction, fixing the problems, decision-making, increasing the effectiveness and eliminating costs (Markus et al., 2002; Orlikowski, 2002). The person can use the knowledge of other people without requirement to learn actually this knowledge element (Hegazy & Ghorab, 2014). Still, according to Ipe (Ipe, 2003) and Landroguez (Landroguez et al., 2011), if enterprises looking for ways to use the knowledge, then they should be aware about how the knowledge is created, disseminated and used as elements above are the foundation for an effective knowledge management.

2. Explicit and Tacit Knowledge

Knowledge created from experiences, information, values and systematic behavior that gives clear framework that used for evaluation of any new information and experience. New knowledge creates in the moment when the employees in enterprises begin to exchange their own knowledge, both tacit and explicit (Hooff & Hendrix, 2004). This process known as knowledge sharing. Knowledge sharing can increase the organizations’ performance despite the fact that the sharing activities’ effectiveness is not always can be measured (Epple et al., 1996; Argote & Ingram, 2000; Eze et al., 2013). Personal knowledge sharing is crucial in organizations as it leads the knowledge-creating organization (Hooff & Ridder, 2004) and increase competitiveness of the firm (Verbeke et al., 2011). Knowledge can be grouped into two types: tacit and explicit. There are numerous ways to categorize knowledge. Individual or group, internal or external, hard or soft, practical or theoretical. Still, grouping on tacit and explicit knowledge proved one used the most and practical (Nonaka, 1994; Pathirage et al., 2007). Joia and Lemos (2010) mentioned that research of tacit and explicit knowledge is most discussed problem in the Knowledge management science. Moordian (2006) and Grant (2007) stated that tacit knowledge concept is at the core of knowledge management. Tacit knowledge is something individual, an ability, skill that is constructed from people owns’ experience. Tacit knowledge is less understandable, usually exists in unconventional form and conscious-less (Alwis & Hartmann, 2008). It differs from explicit knowledge, as it is typically shared by drawings or writing. Explicit knowledge usually described in the form of books, journals, papers, documents, databases etc. (Herschel & Jones, 2005; Nonaka & Krogh, 2009). From organizational view, tacit knowledge implemented in organizational culture and collective understanding while explicit knowledge can be categorized, stored in databases and shared in formal form. Tacit knowledge can be obtained by the experience, reflection or internalization but it cannot be taught and managed (Hall & Andriani, 2002). Tacit knowledge consists of values, beliefs, perceptions, assumptions and stored in human beings while explicit knowledge is possible to store in formal ways (Smith, 2001; Mahroeian & Forozia, 2012; Borges, 2013). Explicit knowledge can be transformed into systematic and structured form with ease and be available to people. Explicit knowledge is one that typically more occasionally exists in enterprises (Joia & Lemos, 2010; Huang et al., 2011). Nonaka (Nonaka et al., 2000) stated that knowledge created through the communication of tacit and explicit knowledge. Sanchez (Sánchez et al., 2012) agreed with Nonaka by adding that tacit knowledge has no use without explicit knowledge, thus, both types knowledge are complementing each other and required for knowledge creation. Sabri (2014) and Szmodics (2015) summarized differences in tacit and explicit knowledge.

Explicit Knowledge can be documented, codified and shared. It can be stored in technological ways and digital systems and is transferable by its nature.

Tacit Knowledge describes what people think in their mind. It difficult to be accessed and evaluated and is not transferable.

3. Knowledge Management in Enterprises

It was stated above that the knowledge could be considered as one of the most valuable resources in the modern business. Therefore, it is clear why it is important to manage it properly. Knowledge management aims to create and utilize information and knowledge. It also responsible for sufficient, effective and efficient usage of knowledge in the way to create strategic competitive advantages for enterprises (Marqués & Simón, 2006; Rahimli, 2012; Nawaz et al., 2014; Loureiro et al., 2015). Researchers (Lee & Lan, 2011; Liu & Deng, 2015) stated as well that knowledge is a crucial success indicator that assists enterprises to gain a sustainable competitive advantage. The improvement of skills and knowledge in enterprises gains its recognition as the factor to obtain sustainable competitive advantages (Fierro et al., 2011; Suresh, 2012). Knowledge management can be one of the important organizational strategies as it provides opportunity to create new business processes to improve the organizations’ performance (Wu & Chen, 2014).

Rasula et al (Rasula et al., 2012) and Ahmed et al (Ahmed et al., 2015) mentioned that one of the main reasons to implement knowledge management in enterprises is that knowledge management provides positive influence and results on organizational performance. Kiessling (Kiessling et al., 2009) research’ concluded that knowledge management provides positive results of the organizations’ innovation, product improvement and employee improvement as well. In the past, enterprises usually competed with each other by providing discounted price and better quality of products and services. Nowadays, most of businesses are looking for new knowledge since it provides sustainable competitive advantages. Meanwhile, the organizations that obtained a lot of knowledge are able to increase their creativity and efficiency as well as achieve a new quality level (Chou et al., 2015; Dickel & Moura, 2016). Liao and Wu (Liao & Wu, 2009), stated that an effective knowledge management channeled with opportunities of development will be a competitive advantage to organizational performance. When enterprises have more developed capabilities, they can supply marketing offerings to match exact customers’ demands.

Knowledge management gives the options for enterprises to research tacit and explicit knowledge of persons, groups and entities and transfer this knowledge into organizational resources to use in decision-making. Knowledge management also provides opportunities to increase the effectiveness and efficiency of organization’s work force (Bhatti & Qureshi, 2007; Dahiya et al., 2012; Byukusenge et al., 2016). Zaied et al. (2012) research’ showed result that there is a connection between knowledge management and performance increasing measures. The knowledge of good quality can be used in decision-making process. Conclusion is if the enterprise knowledge quality is on the good level, then the organizational results stated in performance indicators increases significantly.

Ibrahim and Reid (2009) research also mentioned that knowledge management is also crucial for enterprises for its ability to create sustainable competitive advantages and increase quality of business processes. Better business processes built by sharing best practices amongst employees of different level and thus reducing the processing time and decision-making process. Besides, meetings and conversations of employees can create knowledge of high value that can as well be shared among others. Knowledge management also capable of improvement of enterprises’ operational processes. Rodriguez and Edwards (2010) and Jelenic (2011) concluded about this and researched that operational activities can be improved by reducing time required for the lead, product-to-market time, design cycle time without quality issues since knowledge management improves the product quality as well. Customer service indicators of enterprises are innovated with help of knowledge management. As stated, the knowledge management provides to the organizations opportunity to store the data and information in the proper way. Thus, the employees can look for information requested from customers at much shorter time. This fact also gives competitive advantage over competitors as it helps to provide better services than others (Bueren et al., 2005; Guchait et al., 2011; Pension et al., 2013).

Competitive advantages do not only relate to the performance quality, products quality and technical efficiency of enterprises in current business environment, but it also state about the opportunity to look for new ways to solve any issues in enterprises by the production and usage of knowledge. Innovation management has become crucial in organizations since it makes them able to build an innovative products and services by usage of acquired knowledge (Canongia et al., 2004; Dickel & Moura, 2016). Innovation describes the abilities to create the unique combination of ideas, thoughts and concepts (Manhart & Thalmann, 2015). Porter (2009) and Hitt et al. (2011) stated that innovation strategies are critical for enterprises to be applied. To make sure that the business will survive, it is mandatory for the organizations to add new business value both within enterprises and in competitive environment. By the help of innovation, it creates chances for the organizations to do business processes in ways that are more creative, effective and efficient. It is possible for the organizations to solve issues through innovative solutions that based on knowledge transferred among employees (Storck & Hill, 2000; Jones & Linderman, 2014).

As the globalization process clearly created new challenges to business community, there are many who compete each other in severe competition to win the customers and the market. Enterprises have to deal with the high risks of competition and the chances of losing customers and theirs trust. One of the biggest reasons that causes so much problems is that the organizations have difficulties in following after the quick changes of market trends. The researchers (Cho & Korte, 2014; Tubigi & Alshawi, 2015) stated that knowledge has efficiently encouraged firms to move in the direction of usage of knowledge management. Knowledge considered nowadays as worldwide economy transformation core (Kakabadse et al., 2003). Besides, it is also a crucial resource of revenue and key for the organizations to win competition in business environment (Krogh et al., 2001). Knowledge management acts as a main source to create value for clients. This have led to understanding of knowledge as key resource for any business. In order to implement knowledge management, enterprises should have a good understanding on the ways knowledge is created, disseminated and applied within organizations (Ipe, 2003; Hooff & Huysman, 2009). Knowledge management collects the knowledge from both inside and outside of enterprises, transforms them into strategic options, implements them within organizations and store. Usage of knowledge management can also increase the service quality by delivering faster service response time (Edvardsson & Oskarsson, 2011; Ha et al., 2015). Sirmon et al. (2007) and Carrion et al (Carrion et al., 2016) mentioned that it is not enough for enterprises to be competitive with assets in form of valuable resources; they must be aware how to manage those resources effectively.

* 1. **Information and Knowledge management strategies**

It is crucial that enterprises keep in mind that the environment of operating activities changes all the time. Changing situation regarding interdependencies, relationships, values, and norms for all enterprises that affects organizational, cultural, and strategic innovation process and its creative implementation become typical interest for different researches with high importance (Ahuja, 2000).

Applying this idea, every owner-manager understands that technology leads innovation, and innovation requires technology. Definitely, Information and communication technology (ICT) leads to numerous changes in different markets. Thus, a crucial issue for companies has been the growing ICT introduced in the last 20 years (Cela, 2005).

The researches on this field has usually proposed different views or aspects of ICTs that need to be considered in their scientific researches (Brady et al., 2002). From an economic and management point of view, ICTs described as:

(1) A social construction;

(2) An information provider;

(3) An infrastructure – hardware and software;

(4) A business process and system.

From a marketing side, ICTs have also been perceived as:

(1) A number of different applications (Internet, databases, PowerPoint);

(2) A marketing channel;

(3) A communication/promotional medium;

(4) A marketing technique;

(5) A tool for relationship marketing.

Definitely, ICTs are not just personal computers or the Internet. Never mind the fact that there is the trend to concentrate on Internet technology mostly, the research of technology effects in economy and business fields have to be closely viewed. Nowadays, ICTs presented largely to navigate the information that business creates and uses and wide variation of complex innovations and connected technologies that work with that information. Therefore, ICTs can be perceived as a complex and combining term for a huge range of software, hardware, telecommunications and information management techniques, applications and devices, and are utilized to create, produce, analyze, process, package, distribute, receive, retrieve, store and transform information (Porter and Millar, 1985; Brady et al., 2002).

The usage of unstoppable training systems is playing the huge role to provide opportunity to inform about great potential of ICTs for specific situation. By using it, employees, managers, and entrepreneurs can obtain a learning culture, implementing learning in their daily job duties and understanding deeply the importance of communication and technology tools (Brady et al., 2002; Magretta, 1998; Smith and Blanck, 2002). At last, a following basic element concerns providing a full understanding of the great potential of ICT (Holmqvist, 2003).

Von Krogh et al. (1998) discussed that the aim of the enterprise shifted from environmental view as in Porter researches to a resource-based view and the last decade resource-based view benchmark have shown that the knowledge is one of the key resources in the enterprise. Thus, KM became crucial for all entities. KM strategies can be split into people- and technology-oriented categories, with basis of the origin of strategies. Nevertheless, there is no single opinion regarding KM definition because of numerous stands and backgrounds in different scientific fields, a lot of authors decided that there are basic advantages to be achieved from the systematic and conscious attitude of knowledge related processes in organizations (Maier, 2002). March (1991) highlights two conceptual types of KM: one that explore and one that exploit an organization’s knowledge assets to create sustainable competitive advantages (Zack, 1999). Knowledge management require the division between tacit and explicit knowledge (Polanyi, 1966) or different kinds of knowledge like expertise, know-why and know-what (Sanchez, 1996). Company is profitable when it makes new knowledge by shifting tacit knowledge into explicit and point the necessity of combining internal and external information sources (Nonaka and Takeuchi, 1997). In such environment, an enterprise’s skill to create new knowledge by combination of existing and created knowledge is a requirement for success.

Another important influence on strategic network level analysis was given by Choo’s (1998) concept of organizational knowing to assess the crucial aims of KM on the network level. Organizational knowing consists of three stages - sense making, knowledge creation, and decision-making (Choo, 1998). Each organizational knowing process starts with sense making, which results in knowledge creation to be able for effective decision-making. Through all of three stage of those processes, business has to deal with problems of information requirements, the information search, and the application of available information. All of three elements could be mapped on the time concept. Sense making contain the idea of looking back in time, knowledge creation is looking at the present condition and decision-making aims to the future (Choo, 1998).

A critical challenge in networking is to find a sense making process that will help business make sense of their environmental challenges, their identities and operations. Sense making in enterprises creates a system of shared understanding and definitions on which managed action can operate. A system of shared understanding gives the community rule, the temporal continuity, and contextual clarity for group participants to coordinate and base upon their actions.

The next critical concept is knowledge creation (Choo, 1998). Knowledge creation leads enterprises to a paradox: from one side, innovation follows with uncertainty and chaos and pushes business to question their core competencies while, from another side, business has to change, adapt and learn if it aims to be successful. The various types of knowledge that exist at the same time in enterprises can describe this issue. Sharing of all kinds of knowledge to the company employees is a necessity for atmosphere of innovation. Knowledge distribution happens by interaction, which is the reason why the structure through which enterprises actions affect the scale of diffusion. Lane and Lubatkin (1998) stated a firm’s capability to gain knowledge from other company is discussed to rely on the likelihood of their:

(1) Knowledge bases,

(2) Organizational structures and compensation policies

(3) Dominant logics.

Utilizing of new knowledge and relationships between persons are the subject of influence of tacit knowledge transfer (Soekijad and Andriessen, 2003).

The third stage in the knowing process is decision-making. Choo (1998) mentions Simon’s (1976) statements that rationale of people and their cognitive generalizations are linked and refer to themselves, and consequently based on four organizational decision-making models. Choo (1998) states that: «organizations cope by designing and implementing rules and routines to simplify and guide choice behavior so that it is consistent and coordinated, at least at some minimal level». The decision-making process in enterprise networks is all the time much more comprehensive and results in issues of legitimacy across the enterprises.

Business networks have been researched quite extensively in recent years; thus, it is understandable that numerous different network types described in the literature (Mo ̈ller et al., 2005; Johnston et al., 2006; Harland et al., 2001; Pfohl and Buse, 2000). Typology developed by Mo ̈ller et al. (2005) based on a wide analysis of other research on business networks and describe the view of innovation opportunity in analysis. Mo ̈ller et al. (2005) have described numerous kinds of strategic business networks and management type related to them. Still, value system continuum development and capability-based analysis used as an initial step to identify numerous kinds of strategic business networks, to discuss the value creation opportunity of all kind of types of value systems and networks. The elements providing and delivering specific goods, as well as their value activities and opportunities are reasonably described. They are demonstrated by unknown factors related to value activities and the elements’ capabilities.

Mo ̈ller’s et al. (2005) research demonstrates how advantages are connected with value creation in the network context. Similarly, opportunities that require value creation are demonstrated in order of increasing complexity, not its’ importance. Each of the capabilities demonstrated are important, still, their impact changes in different types of networks.

The strategic network types researched by Mo ̈ller et al. (2005) turns out to be more complex and demand a bigger set of skills while moving along the value system continuum. For this reasons, it can be deducted that KM practices within strategic networks also happens to be more problematic when process of moving from core value production networks towards radical innovation networks is happening (Mo ̈ller et al., 2005).

Academic literature shows alliances and networks as possible development ways to cover internal knowledge deficiencies. Mutual work like this provide chances for knowledge acquisition (George et al., 2001; Soekijad and Andriessen, 2003), knowledge access (Grant and Baden-Fuller, 2004) and learning (Simonin, 1997; Inkpen, 1998; Larsson et al., 1998), as well as access to more diversified capabilities. Thus, many researches focuses on the alliances and relationships between two enterprises (Grant and Baden-Fuller, 2004; Soekijad and Andriessen, 2003; George et al., 2001; Inkpen, 1998; Larsson et al., 1998).

Soekijad and Andriessen (2003) distinguish three main streams of sources on learning and knowledge sharing in alliances:

(1) The organizations can learn IN alliances,

(2) AS alliances,

(3) ABOUT alliances.

Grant and Baden-Fuller (2004) research states that the initial benefit of alliances over both enterprises and markets is in accessing rather than acquiring knowledge. Constructed upon the difference between knowledge generation and knowledge application, they present that alliances adds to efficiency in the usage of knowledge. First, efficiency is increased by knowledge integration into the manufacturing of complex goods and services, and second, by increasing the effectiveness of knowledge usage.

* 1. **Research gap**

The main research area for current topic is between such areas as audit and consulting companies’ management and knowledge management. There are as well contemporary features, such as information technologies and HR management, which have influence on the way managerial decisions are being implemented.

Big4 companies are the one where knowledge is the main asset of the company – knowledge about accounting principles and financial statements, experience of team members and expertise of partners are all elements of complicated system of relationships within the firm. Essentially, this have led to number of researches, dedicated to this area. One of the earliest dives into audit KMS was provided by analysis of Shadow Partner project implemented by KPMG (Eccles, 1991). Furthermore, the idea was developed with additional research that analyzed the original design and growth of KPMG’s KMS called “K-Web” (Alavi, 1997). Later, KPMG’s attempt to create their first global KMS named “K-World” (O’Leary, 2008). In combination with these studies, efforts of other Big 4 companies were analyzed with case study from Ernst & Young (Sarvary and Chard 1997). Still, there has been limited recent researches of current Big 4’s KMS.

Although there are studies about KMS in accounting firms, there is quite a limited number of researches that would include perception of both parties – management and employees who are both elements of such system and its users.

Knowledge management is crucial part for any knowledge-driven business, with audit and consulting companies being no exclusion. Audit expertise and experience to conduct the audit in quickest and, thus, most profitable way are the major parts where knowledge kicks in. And ways to retain, transfer and secure this knowledge are constant pain points for management of such companies.

Considering stated above, the purpose of this current research is to assist in the decision-making process, by developing a model of KMS for audit and consulting companies. The research based on in-depth analysis of one of the Big 4 companies.

As a result of this study, KMS model will be developed. This model will assist audit and consulting companies’ management in increasing the profitability of the firm.

# **Summary of chapter 1**

In the first chapter, overview was given regarding theory and researches related to the Knowledge management and Knowledge management adoption. Emphasis of this work are peculiarities for consulting and audit companies in relation to knowledge. It is known that in major assurance companies, there is presence of systematic Knowledge management but it does not mean that it is successful.

Other issues for audit and consulting companies is emphasis on efficiency, since the speed and quality of procedures are directly connected with company’ revenue margin. This opens the door for number of potential knowledge management research and experiments since they can provide with quick and measurable results.

Another conclusion from current chapter is importance of tacit/explicit knowledge issue. The way to transfer the knowledge from employees’ understanding to formal ways is something that audit companies were concerned about many years ago and this peculiarity will be covered in the following chapter

Literature review show us that Knowledge management is present in researches around the globe. With European countries as the first destination for this issue (especially, the UK), there are some researches from other parts of the world, e.g. Malaysia, Singapore and India. No researches from China and Africa were included though. With known influence of Big 4 companies on a global level, research in the area of Knowledge management would improve from inputs from these parts of the world.

# **CHAPTER 2. METHODOLOGY OF KNOWLEDGE MANAGEMENT MODEL RESEARCH**

## **2.1. Methods of Business Research**

Research methodology is a strategy for conducting research: gathering information and data with the purpose to solve research problem. By other words, research methodology is a set of research methods to study research questions and answer those (Rajasekar et al, 2013). No matter the fact that great amount of research methods is available, for current study two methods will be used: case study and in-depth interview.

As was mentioned before, there are following research questions to be covered during the current study:

1. How does KMS model looks like in audit and consulting companies?

2. How employees evaluate effectiveness of KMS elements?

3. What can be done in order to improve the effectiveness of the model?

In order to answer the first research question, the case study was performed. Analysis is performed of existing KMS in one of the Big 4 Company. This research method is commonly used for qualitative research (Duff, 2012).

The second research question is answered with the help of the interview, conducted to gather opinions about effectiveness and perception about different elements of the model. Interview helps to get useful feedback to improve the system and to get the personal opinion from employees.

In order to analyse the results, the traditional method is used, since the number of respondents is less than 40 (Adams et al., 2007). Performed interviews constructed to have logical structure. There are five general topics. Moreover, there are several requirements to the respondents imposed: a respondent should have been current employee of Big 4 Company that would guarantee that this person would be involved in KMS as an active user. More detailed and comprehensive description of research methods, which are used, presented in the following section of current chapter.

## **2.2. Audit and consulting companies definition**

For current analysis we picked one of the Big 4 companies, choice is not limited by geographic presence since each of them have branches in Saint-Petersburg with their own projects and similar business model. As was mentioned above Big 4 companies audit 99% of the companies in the FTSE 100, and 96% of the companies in the FTSE 250 Index, an index of the leading mid-cap listing companies (Christodoulou, 2011). Information regarding revenue and number of employees presented in the table below

Table 1 – General characteristics of Big 4 companies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company name | Headquarters location | Founded | Number of employees (2017) | Revenue (2017) |
| PwC | London, UK | 1854 | 236,000 | $37,7 bln |
| Deloitte | London, UK | 1845 | 263,900 | $38,8 bln |
| Ernst & Young | London, UK | 1849 | 250,000 | $31,4 bln |
| KPMG | Amstelveen, Netherlands | 1818 | 200,000 | $26,4 bln |

Legally each company is presented as a network of huge number of legal entities that operates in specific countries. So, in Russia there are JSC “Pricewaterhousecoopers Audit”, CJSC “Deloitte and Touche SNG”, LLC “Ernst & Young Vneshaudit”, JSC “KPMG” with headquarters in Moscow, companies that leads operating activity autonomously from its’ holding corporations. This structure, together with local ownership in face of firm’ partners, allows them to operate in most of the countries and decrease the risk of potential lawsuits or sanctions that could affect the whole network of companies. Though legally separated, each of the companies still share technologies, approaches and strategies of its network companies.

Additionally, all of the companies have regional offices in order to stay close to potential clients that do not have offices in Moscow or in order to decrease the cost of the project. So, PwC has 10 offices with 2700 employees in total, Deloitte – 6 offices with 2100 employees in total, Ernst & Young – 9 offices in Russia with 4000 employees in CIS region, KPMG – 13 offices with 3000 employees in total. All of the mentioned companies have office in Saint Petersburg, second by size and generated revenue after headquarters in Moscow.

Currently audit services are subject to control of Ministry of Finance of Russian Federation with potential change of governance role to Central Bank of Russia. Currently, Ministry of Finance publish annual industry report that helps us to understand current situation on the market.

Table 2 – General characteristics of audit services rendered

|  | **2012** | **2013** | **2014** | **2015** | **2016** |
| --- | --- | --- | --- | --- | --- |
| Amount of service rendered – total, bln. RR. | 51,0 | 51,7 | 53,6 | 56,1 | 57,1 |
| Growth in comparison to PY, % | 0,5 | 1,4 | 3,7 | 4,7 | 1,8 |

As stated in the table 2, audit services market is steadily growing. Ultimately, audit and consulting companies are strongly connected with economy growth and business activity – growing companies means more work to do and more revenue to collect. Since current condition of economy in Russia is highly influenced by global political situation, it can be mentioned as another important factor.

Table 3 – Characteristics of first 50 companies in the audit industry

|  | **Big 4** | | **Rest 46 organizations** | |
| --- | --- | --- | --- | --- |
| **2015** | **2016** | **2015** | **2016** |
| Revenue share in total revenue in the industry, % | 46,0 | 47,8 | 19,9 | 19,8 |

Being true for most countries, Big 4 companies collect biggest shares of revenue on the market. In total, Big 4 companies represent almost 50% of the market (table 3).

The company that we are going to analyze has 200 employees in office in Saint Petersburg. While having some peculiarities, all Big 4 companies have the same business model and being not closed from ideas of other companies on the market, their approach to KMS have many common ideas.

## **2.3. Benchmark for Knowledge management model**

As a benchmark for KMS modelling we have used following approach. At first, we described elements and labeled them with three different indicators, related to their function – Knowledge creation (KC), Knowledge storing and organizing (KS), and Knowledge transfer (KT). While many elements can function in several roles, all appropriate labels will be used. Then we will mark down connections between elements that will result in our model.

We analyzed peculiarities regarding mentioned companies that might affect KMS solutions.

**Documentation principles**

“Not documented – not happened” – this is the very first principle that all new comers are learnt to during first month trainings. Every piece of information – primary data, explanation by the client, specific procedures approach – everything have to be documented in full and clear way. Benchmark for this principle is the following rule – Professional accountant without any experience with specific project have to be able to understand everything from the documentation. This fact affects significantly the way engagement team is going to access the knowledge of previous year projects (if applicable).

**Project-based approach**

Operationally, daily work in Big 4 companies organized in project-based approach. For audit procedures, project name contains following information:

-Client’ name

-Reporting year

-Accounting principles (Russian Standards of Accounting, IFRS, etc)

-Specific business unit, in case of RSA audit of holding companies

Therefore, project name, for example, could be “Apple 2017 IFRS”.

For each project engagement team is appointed. Engagement team have following structure:

-Management. Partner have the role of facilitator in the team, he contribute his time only to most important concerns that rest of management team think they should be aware of. Engagement leader in face of senior manager/director is the one who have full responsibility for engagement and contributes a lot of time for planning procedures and managing the rest of the team. Senior consultants are the one who have great technical skills and have responsibility both for younger team members and for most technically difficult tasks. Work planned that way, so once person was assigned to some project, company tries to put him in the same project in the following years as well. This is another tool to make sure that once new comer will learn all essential parts of the project and will coach new members of the team in a couple of years.

**Data storing**

During the project, most of the data is stored in the Project file in dedicated software. Typically, information is presented in Excel spreadsheets and pdf files. When the project is over, whole database undergoes archiving procedures and being put in the storage without ability to make any changes.

**Information access**

To access specific database, you have to submit the request to engagement leader in dedicated web-portal. Only people from approved list have technical possibility to download the database. This fact might limit the knowledge transfer between engagement teams.

**Busy season (free time during summer)**

Specifically for audit companies, working hours are vary during the year. In autumn, all project starts with interim procedures. Right after New Year holidays so-called “busy season” starts. In order to prepare financial statements of previous year for clients, all employees starts to work until 8 pm at least. This condition lasts until the end of April, and then, during the summer, most of the office does not have a lot of workload. This affects the way, trainings and professional qualifications exams planned. Everything is put in the summer window and some of trainings and exams are in the autumn. All educational events are prohibited during the busy season, since the workload is already too high to take any additional hours from it.

**Qualifications**

In Russia, there are two major qualifications that all employees have to achieve. First, ACCA (the Association of Chartered Certified Accountants) is the global body for professional accountants founded in 1904 and represent the fact that member of the organization is professional accountant on the global level. In order to become the member of ACCA, one should pass 15 exams and have no less than 3 years of related job experience. Together with specific dates for exams, this means that for audit companies ACCA membership can be achieved in 3-5 years.

Russian audit union license is required to be able to lead the audit of companies in Russia. Structured in several exams, participants usually spent 2-3 years to pass all of them.

Big 4 companies cover several attempts for exams mentioned above, then employee pays for any additional try.

**Knowledge management elements in audit and consulting company.**

Analysis of different elements we conducted on the process of audit procedures, since they are more standardized and can be applied to any of Big 4 companies.

1. **Direct audit procedures**

**Preliminary understanding of the client**

Before signing the contract with the client, news websites and external experts are being used in order to gather knowledge about the Client, its business and industry forecasts. This stage is crucial to identify any potential risks and the ways to avoid them. During this stage, knowledge is being transferred to the engagement leaders and then stored in the appropriate audit file to be transferred on demand to other team members later.

**Team meeting**

Before audit starts, the whole team gather in order to share vital information, discuss concerns and approach to different procedures. Questions are welcomed and help everyone to understand the scope of work. During this stage, knowledge gathered by different team members during planning procedures is shared and discussed.

**Minutes, phone calls, correspondence with the client**

During planning procedures and while performing audit, engagement team constantly gather new inside information, regarding accounting principles that exist in the company, business model, industry situation and etc. Principle "Not written - not happened" is one of the main rules. Knowledge here is being created and stored in the appropriate audit file; team leaders are transferring any crucial information to team members. Since all procedures have multiple levels of approval - knowledge, relatable to the engagement, will be written in with no exclusions

**Previous year database**

If applicable - team members refer to PY audit files to use as a benchmark and to understand specific details regarding to accounting procedures of the Client. This means that knowledge created and stored during procedures mentioned above is always available for next year engagements. Thus, knowledge created always used as a reference in the future.

**Database archiving**

When the engagement is over, audit file archived in Audit management software. Gathered evidence (documents from the client) archived and stored in audit file or separate cloud-based service. All original documents and paper files are stored in physical archive with engagement leader being responsible for its completeness and accuracy. All knowledge that was written is securely stored and archived for future use

**Feedback**

During engagement and right after it, all team members give and receive feedback in order to help each other to grow, to share useful tips and give recommendations. All members receive evaluation that represent their impact during the engagement and how it met expectations from current employee grade. During feedback, knowledge transferred in terms experience and recommendations.

1. **Training**

**Annual trainings**

From the first month in the company, and on annual basis, all staff goes through trainings, tailored to specific grade. Their purpose is to share the knowledge about the way company conducts audit, technical skills, required to work effectively, soft skills that would contribute for better dialogue with the Client. Knowledge (i.e. created from engagement and being useful for everyone) transformed in explicit form, stored as learning materials, and shared in form of mandatory trainings with employees.

**Accounting associations’ entry exams**

Company provides employees with materials to prepare to ACCA and RSA entry exams that can take up to 5 years in total to complete. While preparing, employees learn about theoretical approach to IFRS and RSA accounting principles with many specific case studies. That is how huge area of theoretical knowledge transferred to employees from associations with professional approach to industry related knowledge gathering.

1. **Other elements**

**Informational letter**

Each employee receives sets of informational letters that provides new insights, changes in accounting policies and hints. They can be related to recent change in laws, or some short tip that methodologist group found to be helpful. Thus, knowledge transferred to each employee and stored in email for future reference.

**Webinars and meetings**

Semiannually, top-management of the firm held the meeting to share results of the company, both global and local. Most important news and upcoming changes shared with whole office. Q&A session helps to provide feedback and concerns back to the management. This helps to share some additional knowledge with all employees.

The table below shows the summary of elements and IT solutions that support them:

Table 4 – KMS elements list

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| № | Element | IT view | Knowledge creation | Knowledge storing | Knowledge transfer |
|  | ***Direct audit procedures*** |  |  |  |  |
| 1 | Preliminary understanding of the client | Excel, Audit management software | x | x | x |
| 2 | Team meeting |  |  |  | x |
| 3 | Minutes, phone calls, correspondence with the client | Excel, Audit management software | x | x | x |
| 4 | PY Database | Excel, Audit management software |  | x | x |
| 5 | Database archivation | Audit management software, cloud-based archive |  | x |  |
| 6 | Feedback | Feedback service that tracks record of all post-engagement feedback |  |  | x |
|  | ***Training*** |  |  |  |  |
| 7 | Annual trainings | e-learning portal | x | x | x |
| 8 | Accounting associations entry exams | e-learning portal, materials and number of applications that help to prepare to exams |  |  | x |
|  | ***Additional elements*** |  |  |  |  |
| 9 | Informational letter | corporate e-mail |  | x | x |
| 10 | Webinars and meetings | Webinar platform (webex) |  |  | x |

## **2.4. Knowledge management model benchmarks comparison**

For purpose of research, we are going to analyze several KMS models in order to pick one for future analysis. We will analyze three models:

-NASA Knowledge management model (2011)

-Gazprom Neft Knowledge management model (2015)

-Finland parliament Knowledge management model (2002)

Each model represent one substantive part of knowledge management application. NASA is the organization that was one of the earliest to grasp the importance of the knowledge and that this aspect have to be managed. Gazprom Neft is the corporate structure and its KM model will show the way Russian business manage the knowledge. Finland is the country world-known for its approach to education and knowledge-driven innovations. Thus, federal approach to KM model in its parliament can be considered as another benchmark for future analysis.

**NASA Knowledge management**

Goddard Space Flight Center (GSFC) is a major NASA space research laboratory, established on May 1, 1959 as NASA's first space flight center. Currently GSFC employs approximately 10,000 employees and is the one of ten major NASA field centers. For space science, knowledge management is not just crucial, but is the foundation of the whole organization.

This understanding clarified by mentions in several documents and official notes. US General Accounting Office GAO-02-195, 2002 states the following: “NASA needs to strengthen its lesson learning in the context of its overall efforts to develop and implement an effective knowledge management program. We recommend that the NASA administrator strengthen the agency’s lessons learning process and systems by: articulating the relationship between lessons learning and knowledge management through an implementation plan for knowledge management”.

According to the stated, NASA is looking for ways to organize Knowledge Management with several goals:

Manage knowledge assets. Managing knowledge assets involves finding, tagging, structuring and filtering the content of knowledge generated. Since many of decisions based not on repeated before theories and benchmarks, new knowledge created with each new task. Thus, knowledge collection process must reflect this reality and collect wisdom that is useful to those who may need it in solving the challenges in front of them.

Facilitate knowledge application. Every piece of generated knowledge must be findable by other employees. Still, that does not mean that everyone have the access to any information. Index and search systems will discover what is at Goddard but the appropriate control of that information and knowledge will remain with the owners. Modern IT systems are doing the job to help to find information and to check, who should and should not have the access to this information.

Build the learning organization. To function as a learning organization organization must have a structure for its knowledge, behavioral standards, and policies and procedures that support and drive learning behavior. This will require learning and knowledge management activities to be coordinated more at the center level. Knowledge should be organized as closely as possible to the work processes that it affects.

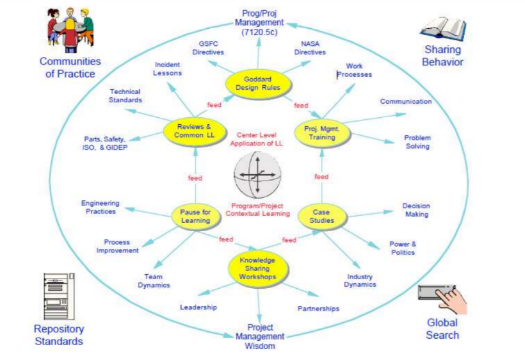


Figure 1 – NASA KM Model (Rogers, 2011)

Figure 1 shows the six core practices of the KM model at GSFC. The top three lend themselves to centralized management where review processes, lessons learned and training decisions need to be made for the good of the center. The lower three are tied to the project life cycle and need to be aligned with workflow processes in order to be effective. Importantly, the lower half is essential for informing the upper half with valid content. Lessons learned extracted from the organization and devoid of context are often meaningless and probably useless.

**Gazprom Neft**

Gazprom Neft is the fourth largest oil producer in Russia and ranked third according to refining throughput. It is a subsidiary of Gazprom, which owns about 96% of its shares. By the end of 2012, Gazprom Neft accounted for 10% of oil and gas production and 14.6% of refining activities in Russia. Production volumes in 2012 increased by 4.3% in comparison with 2011, refining throughput grew by 7%, revenue was up 19.5% with EBITDA and net profit advancing by 7.7% and 9.9% accordingly.

According to the proposed Knowledge Management System, there are several goals to achieve: the need for increased cooperation, Problem with finding up-to-date information (best practices), the problem with experts search.

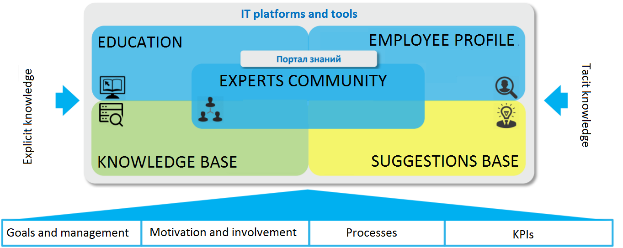


Figure 2 – Gazprom Neft KM model (Bezyaev, 2015)

Figure 2 shows the model for Knowledge management in Gazprom Neft. Emphasis here is put on transition of explicit knowledge and tacit knowledge by existent IT platforms. Explicit knowledge transferred by education events and knowledge databases. Tacit knowledge can be expressed by IT-powered suggestions and ideas platforms. Experts’ community in the center of the model are responsible for moderation and management. Each part of the model is the subject to influence of following elements: Goals and management, Motivation and involvement, Processes and KPIs.

**Finland parliament**

In May 2000, the Finnish Government agreed on the objectives and key measures for a reform of central government. This reform policy is based on a principle decision made by the Cabinet in April 1998: “High-quality services, good administration and a responsible civil society”, and on the work of an international assessment group that analyzed a required reform of central government in Finland. Both publications focus on principles that are partly applicable as premises for this parliamentary Knowledge Management Project. The following is an example of such principles: “Functional administrative policy tools will help the Parliament and Cabinet steer economic and societal changes and manage the state community in accordance with the Government’s objectives.” From a parliamentary point of view, knowledge management is an issue that largely focuses on central tools of power exertion and the opportunities to strengthen parliamentarianism (Suurla, 2002).

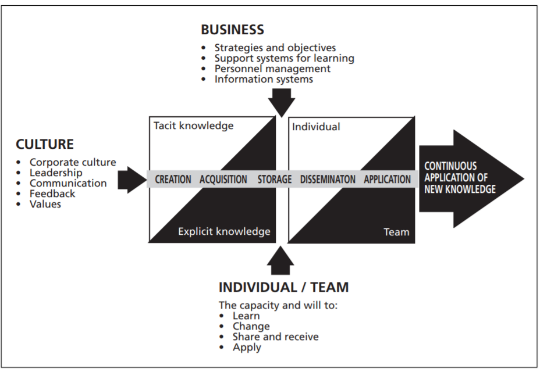


Figure 3 – KM reference frame for Finland Parliament (Sydänmaanlakka, 2000)

This reference frame used for systematic analysis of parliamentary work and parliamentary knowledge management activities. There are several viewpoints, such as the Parliament’s tasks, individual MPs and MP groups, submission processes, interest groups, and citizens. The various viewpoints involve different needs for knowledge with various knowledge acquisition methods. For example, the type of knowledge required in committee debates can be obtained by hearing experts, from the Parliament’s own information systems, or by turning to in-house information system specialists.

Figure 4 describe the knowledge management dimensions. This picture indicate that technology is just one of several knowledge management sectors. What was considered equally important is to develop leadership, processes, an open organization culture and open organizational activities, strive towards the elimination of boundaries in the spirit of joint objectives, and support learning and networking.

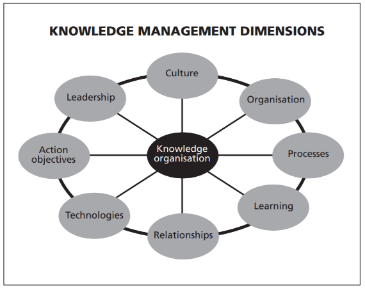


Figure 4 – Knowledge management dimensions for Finland Parliament (Suurla, 2002)

As one essential part of the IS&KM Project the KM target stage defined towards which different actors in the Parliament have to strive for. Description below present the KM target stage pertaining to the various dimensions of a knowledge organization (Suurla, 2002).

Culture - joint value basis for action and open, active work culture. Co-operation, interaction and sharing of knowledge as a cornerstone of the culture.

Organization and processes - developing activities and services through co-operation: expertise decides, not a person’s organizational status; open sharing and exploitation of good practices, ways of action, etc.; efficient internal communication.

Processes - service development based on a clear understanding of the MPs’ objectives and tasks; clear definition of available services and the role of parliamentary assistants; clear definition of the role of civil servants.

Learning - systematic and coordinated development of competence and expertise; use of development discussions to monitor competence development and related needs; investing in personnel familiarization, throughout the organization; support learning at work. Rotation of posts and jobs; interaction at work.

Relationships - close co-operation with the Council of State, Joint ventures; free access by everyone to information on external specialists and their expertise; active political influence by citizens.

Technologies - providing support to the exploitation of available knowledge and services through education and training; providing support to testing new services; person-specific user interfaces and tools; ICT infrastructure invisible to users (knowledge portals); providing additional support to co-operation sand knowledge dissemination through ICT. For three models above, we will perform comparative analysis. Model should be applicable to audit and consulting companies, be relevant to the issues of KM in the company, to be applicable to significant elements and t contribute to better understanding of the way the company manage the knowledge.

NASA model provides good understanding of tools that are used in the organization and their interconnections. Main purpose of this model is to demonstrate how elements of KM influence each other and result of each element. For example, according to the model Case studies enhance the quality of decision making, affects power & politics in the team and allows to understand better industry dynamics.

Gazprom Neft model acts as a combination of goals, IT tools and different types of knowledge. This model tries to achieve the goal of demonstrating the way tacit and explicit knowledge is stored and transferred with the help of IT platforms.

Finland parliament model shows two major points in knowledge management – all five stages of knowledge (creation-acquisition-storage-dissemination-application) and elements of Knowledge management together with target goals for each of them.

## **2.5. Knowledge management model design**

We have three models to start our work with and we have to identify which one is better to visualize elements that we have already listed above. Important part of description of elements that we have performed is the variation of roles in creating, storing and transferring the knowledge. This analysis could provide great insights of where to start to dig deeper to increase the quality of the system.

Only Finland parliament’ model in our analysis shows the flow of the knowledge within the company. Still, it has its flaws like lack of the elements that are used in the company and shows more generic approach to knowledge management process. Additionally, for purpose of this research we combined elements of knowledge creation and knowledge acquisition – our model would show more “field” approach when engagement teams creates knowledge by acquisition from clients, professional organizations or other teams. We did not include knowledge application as well since our research is concerned with tools that used in organization that can be enhanced, while, knowledge application lies more in forming expert attitude toward work to be done. We took the process line of knowledge flow and mapped listed elements, which resulted in following model:

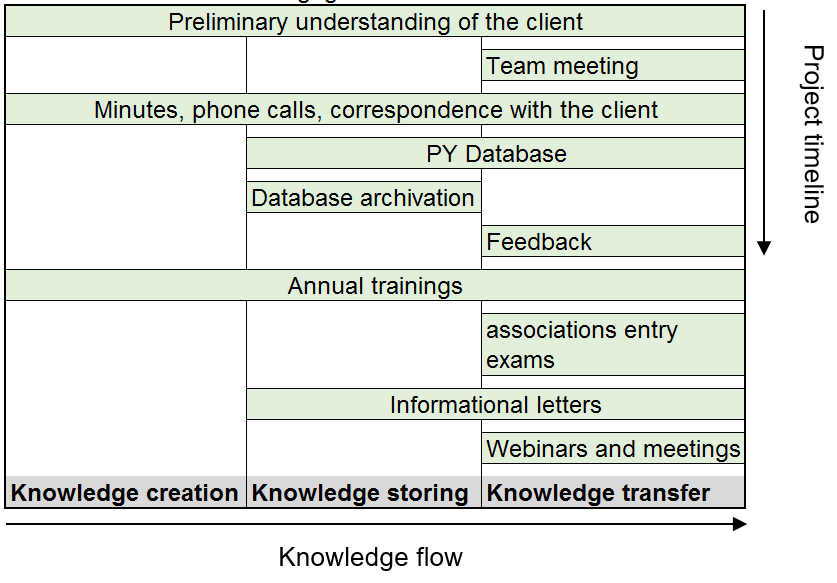


Figure 5 – Mapped knowledge management elements

This figure 5 already give us an understanding about how much emphasis is put on the transfer of the knowledge. Important point here is that majority of those elements are working only within the single engagement team with no interconnections between teams. If we will draw the same model for two or more engagement teams, it will have the following outlook:

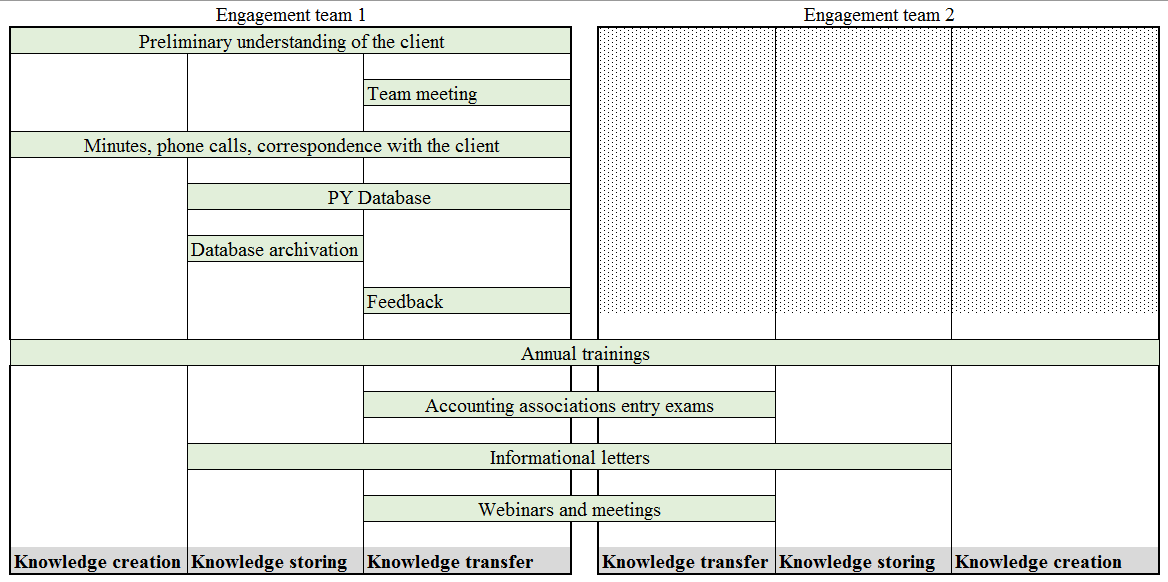


Figure 6 – Engagement teams’ knowledge interconnections

Figure 6 above demonstrates that knowledge management elements that contributes to knowledge creation in one engagement team is rarely contributes to another. To deal with this audit and consulting companies are doing the following:

-Team rotations. While each of the employees will have several projects with people who, in their turn, do have some other projects, it can open the access to knowledge from several projects even by if the person was not assigned to it. This action still will not contribute to 100% knowledge transfer within the company.

-Best practices. Information letters distribute all best practices that can affect majority of engagement teams. This helps to distribute the most crucial knowledge.

This results in two-way knowledge transfer. Engagement teams writes down any piece of gathered evidence and understanding of the Client. Important part of the knowledge goes upward on the level of the Firm, region or even global network. However, not every project provides any significant insight. Intersection between teams allows transferring knowledge horizontally amongst employees (figure 7).

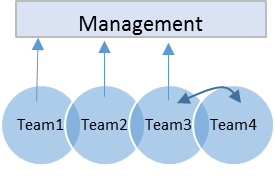


Figure 7 – Upward knowledge transfer

Best practices, legislation changes, new projects and expertise provides new benchmarks that have the potential for global use. Those benchmarks distributed and build up number of tools that team can refer to during audit (figure 8).

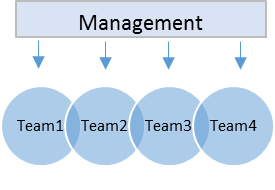


Figure 8 – Downward knowledge transfer

## **2.6. Analysis of interviews**

In the previous section, we have built the model of Knowledge management. The model revealed main characteristics and functions to pay attention at. In order to gain the feedback from employees of the company, we have conducted the interview sessions. Interview was designed for employees, who have already met with all of those elements and can express their opinion. The main aim is to identify what are perception and perceived effectiveness of KMS model. Interview consists of five broad topics that resulted with additional more narrow questions:

• Personal information (years of experience, grade). This question is for gathering the personal information about respondents.

• How good this model describes the Knowledge management in the company? This question starts with short description of the model, and have the goal to start the discussion about knowledge management in organization and the knowledge flow in audit process. Feedback for further improvements is analyzed further.

• What challenges there are in the company related to knowledge management? Since peculiarities regarding Knowledge management in the audit and consulting companies was listed earlier in this chapter, it was important to assess those peculiarities and what kind of challenges might arose from them.

• How can be improved the situation of knowledge transfer amongst engagement teams? As one of the idea behind the model is to initiate the discussion about Knowledge management in the company, it was crucial to understand, how effective it works in terms of generating new ideas to cover the mentioned challenges.

• What is your role in Knowledge management process? It was proposed to describe own role in Knowledge management process in terms of current position and where it contributes mostly at the current period. It was proposed to assess what is their role – either it creation, transfer or mainly storing the knowledge, during audit process.

In order to get different views following approach for sampling was chosen. Three experienced associates from different engagement teams was picked in order to provide different insights regarding the Knowledge management in organization. All of them have different educational background, and one of respondents have experience in several Big 4 Companies, which can be another element that could influence personal opinion about Knowledge Management.

Below listed main information from each of three interviews:

**Senior associate, 3 years of experience.** Main complaint about the model is that feedback is not really provides good condition for knowledge transfer. Typically, it is always postponed, so it is hard to remember good bits of information that would be helpful. Besides that, this model pretty much show, which elements are active during audit procedures. Main challenge, I think, is the personnel allocation. Most of us have the same set of projects each year, so if one employee have easy projects and another have a set of very challenging projects – their expertise would be very different in three years. This is the problem of knowledge curve – how to make sure that there are as minimum as possible of such cases. In order to increase the quality of knowledge transfer, I suggest to increase the role of engagement leader – he can be more involved to the project to share essential knowledge. I think that my main role as senior is the knowledge transfer.

**Senior associate, 4 years of experience.** Good model, but I think that knowledge transferred between teams in case of people sharing their knowledge from previous projects. In addition, engagement quality departments can be the element to share the knowledge between teams. Main challenges for elements from this model is the current approach to annual trainings – their topics are too broad to be applicable by anyone. Additionally, we receive many useful informational letters, but management itself does not do anything to share this information as well. As one idea I think that access to previous year databases should be based on grade of specialist – it would be helpful to have access to many projects’ databases, if they do not have any specific restrictions. As for me, I think that my main part is the documenting and storing the knowledge.

**Consultant, 2 years of experience.** I would recommend to add informal communication as one of the elements of knowledge transfer, and for feedback I would enhance it by calling “Feedback and coaching”. Main challenge in any aspect of our job is busy season’ time constraint that might affect the effectiveness of each of the element **–** you just would not have time to share your knowledge with anyone. Or this could lead to miscommunications, when the person does not understand clearly what you have said. Another thing is that not all of these processes has any clear control that would make sure that they actually performed their role as a knowledge management element. I would recommend something like case competition, when the hardest task from previous years turned into the case to compete with other colleagues. As for me, I think that my main role is the knowledge transfer.

# **Summary of chapter 2**

In this chapter, business research methods were described and used. For the purposes of business research, case study and interview were performed.

Review of Big 4 Companies provided useful insights in the way those company operates and what can affect Knowledge management organization. Many listed above peculiarities have direct connection to main business area for Big 4 Companies – audit procedures. This fact underlines the complexity and importance of the audit for growth of enterprises.

In order to analyze Knowledge management process during audit procedures, 10 different knowledge management elements were reviewed. Every element was described and analyzed in terms of roles, IT tools and peculiarities. Three different knowledge management models were analyzed to set a benchmark. Based on benchmark, all elements were assigned to build the system.

Based on the performed analysis, interview questionnaire was created. It aimed at Big 4 employees. The requirements for interview were as follows: an interviewee should have been involved in audit procedures. The aim of the survey was to identify employees’ opinion about built model. There were three interviews conducted. During interviews, respondents shared their opinions about what can be done to enhance the effectiveness of knowledge management. As a result, feedback was received to improve the initial model.

Main complaint for the current iteration of the model is the following – it is hard to read and distinguish organization-level elements and audit engagement level elements. In the following chapter model will be adjusted in order to improve readability for any user.

# **CHAPTER 3. DESIGN OF THE KNOWLEDGE MANAGEMENT SYSTEM MODEL IN THE ORGANIZATION**

* 1. **Update of Knowledge management model**

The Knowledge management system model is a tool that aimed at assisting engagement managers to increase the awareness of knowledge application in the company, which would increase the profitability of each project. It is by all means is a complicated task to understand how the knowledge flow is organized in operational processes and what can be done in order to enhance their quality. There are many peculiarities exist, and the proposing model will address and tackle them.

After received feedback, following changes considered as essential to improve its quality:

-New elements to add: Engagement quality department feedback, Informal communication

-Organization-level elements should be presented separately in clear way

This feedback was taken into consideration for following iterations of the model. New elements were added with according role in Knowledge management process. Organization-level elements were separated above in order to have clear distinguish between audit process elements that apply to one specific engagement team and organization-level elements that are universal for all employees.

We have resulted with the following model:

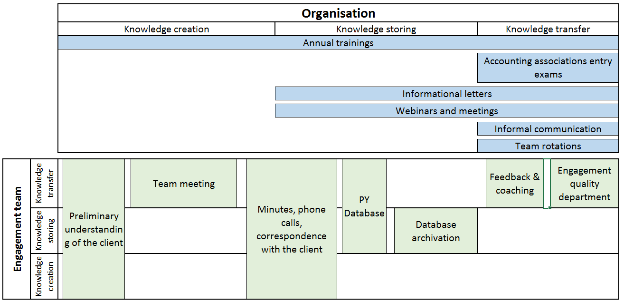


Figure 9 – Knowledge management model

Knowledge management elements were split in two groups. First – is the organization level that affects all employees of the company in the similar way. Following elements added in the model – Informal communication, team rotations. Informal communication can be the effective tool for knowledge transfer. Even though one cannot have the knowledge from other project, he can refer to the person he knows from that project in order to answer questions. Team rotations were already mentioned as one of the elements to share knowledge from engagement team to another.

Engagement team level relates to each engagement team independently. All of the elements presented in the line of their occurrence. Engagement quality department element added – just before the completion of all procedures, complete financial statement sent to engagement check department that goes through documents to find any unclear moments and mistakes. Difficult questions and knowledge of narrow specifics shared with the team during this procedure.

This model have the following purpose. As the audit procedure goes, management can check if all of the elements are not just completed but rather perform their functions in knowledge management process. All of the knowledge that transferred and created during the audit procedure should be checked on the fact that it is stored accordingly. Nevertheless, more effective is the usage of this model for understanding of the way knowledge flows between engagement teams. Evaluating which part of the knowledge was transferred with organization-level elements is the crucial part to create new elements that will make sure that there is no hidden knowledge within the company.

Built model have made its iterations in the following way. Originated from Finland parliament knowledge management framework model, elements were mapped out that have relation to single audit process. As a result, first model was built and discussed in Chapter 2. Transition process affected significantly the original model, so, series of interviews was conducted in order to get feedback for further improvement. Earlier in this chapter, feedback from interviews was assessed and needed changes were implemented. In order to assess the model applicability for Audit and consulting companies on big scale and discuss its managerial implication, discussion with company’ management was conducted.

## **3.2. Discussion with expert**

In order to validate the model and assess its’ applicability for audit and consulting companies, deep interview with employee in management position was taken.

Management position in audit process responds to several obligations: to organize the teamwork; to solve complicate issues with client; to review crucial tasks and corresponds significant matters to upper management; to organize audit process in order to increase profit from engagement. Due to high level of responsibility and constant formal feedback that influence annual score, management of the company have significant interest in making each process more and more effective. Knowledge management allows them to decrease the time to spend on each engagement, thus the concept is already familiar to them.

For our deep interview, following plan was prepared. First, the expert is to be introduced to the model with full description of its logic. Then, expert has to share his perspective of how the organization deal with Knowledge Management process and if the model fits in given description. Specific example of knowledge flow on example of one audit engagement is to be introduced and mapped through the model in order to clarify the applicability of the model.

Big 4 manager shares his opinion with regards to given model that it definitely mentions all significant elements of audit process that relate to Knowledge Management in any of described roles. His opinion is that the model itself can illustrate the challenges in knowledge flow. For an instance, it is might be hard to identify staff that have great knowledge that would increase the quality and speed of rendered services. Some knowledge about testing approaches are the subject of personal judgement from management perspective – this can lead to different interpretations of same Knowledge management elements that are mentioned in the model.

Another important part of the model is the organization level elements of knowledge management. Those are more formal and represent the understanding of knowledge management within the company. For example, recent unification of personal profiles service and project booking platform partially solves the problem of picking right people on appropriate projects. It allows to look through past projects, job experience, skills and personal interests to be sure that employee will bring value to the project.

After all, manager said that given model fits in current audit process and describes Knowledge Management elements to known limits.

To give specific example of knowledge flow, company manager mentioned following issue with one of the clients. At one of audit engagements, there was a huge challenge to test lease obligations since its amount increased significantly in past several years. New task has to be done by company consultant and with no reference regarding critical parts of contracts to focus on it would take enormous time to complete. Thankfully, manager knew the project that had the same issue and was able to contact the consultant with person who already completed such task before. This clearly shows that in many situations, knowledge transfer relies on informal communication, powerful tool, yet, do not assure that everyone is aware about existence of particular knowledge within the company.

Another example is the huge project with many team changes throughout each year. In the end of engagement team gathers in order to record the memo for themselves in the following year. This memo contains all critical issues that were resolved during the project and tips for next year – this is another informal and non-obligatory element that helps to make sure that nothing important is lost.

To sum up, while mapping knowledge flow between engagement teams on the model, it was clear that there are not enough elements on organization level that would contribute to more effective knowledge sharing, rather it is left on networking and professional judgement of employees. The model provides an insight at which moment new knowledge, stored in explicit form, has to be shared and which of existent tools we can use for it.

## **3.3. Managerial implications of main findings**

The results of current study are applicable to consulting and audit companies in several ways. Designed model suggested for use by practitioners in mentioned companies, middle and top-level management as well as HR-department.

At first, interviews can open the door for discussion about effectiveness of the knowledge management processes in the company. Even least experienced employees demonstrated great interest in this area; since they all understand that knowledge have direct impact on their effectiveness and future career. New ideas, like case contests, can enhance the quality of knowledge transfer in the company and increase the motivation for usage of gained knowledge. Smaller companies can understand the way they can compete for qualified personnel by undermining those points mentioned in interviews.

At second, audit and consulting companies’ management can use the designed model to develop new approach to transfer knowledge from engagement processes on organization level. The use of model will provide insights regarding evaluation of effectiveness of elements on each engagement. As a result, management will be able to enhance the quality of knowledge management processes in the company.

At third, knowledge-oriented view of engagement processes can increase the quality and speed of audit procedures. Annual learning curve will lead to much faster results, which in turn will have direct effect on companies’ profits. This can be achieved by two ways:

1. Management can increase awareness of knowledge-related implications of each element of engagement process. Management can be evaluated by higher peers based on effectiveness of knowledge processes within one specific engagement. Since each employee, including management, already goes through evaluation, knowledge management can be shaped in one of KPIs.

2. On organization level company can create new elements to transfer knowledge that can be stored in one specific engagement. Ideas from interviews, new elements to share best practices and theoretical knowledge, existing elements revising and reshaping – each company can achieve the goal of increasing effectiveness of each employee by constant innovation process.

## **3.4. Limitations and validations**

The developed knowledge management model is suitable for all audit and consulting companies that renders financial statement audit services.

Consulting services are harder to structure and might have peculiarities that would create completely different model structure, thus, were not considered within the current study research.

Moreover, small audit and consulting companies were as well excluded from the study, since at most cases, they would simply repeat procedures of Big 4 companies with small changes and some simplifications. The reasons for that is the tighter budgets and lower expectations in terms of audit quality. For the purposes of current study, only local office of Big 4 companies were considered with their traditional approach for the whole network of companies.

Other benchmarks can be used to start the model design. In this research were used three models from different industries and countries, still, different benchmarks can lead to new insights and ideas. As well as cultural limitations were not studied in conducted research.

# **Summary of chapter 3**

Current chapter is dedicated to final changes in knowledge management model and its’ assessment by company’ management. This model aimed at Big 4 companies worldwide. Additionally, developed model is useful and suitable for smaller companies as well, since the procedure have the same accounting basis.

Created model have the goal to assist management in increasing the effectiveness of each audit engagement. The model have two-dimensions and show knowledge flow during engagement process and organization-level elements. As a result, management receives complete map of knowledge management elements that can be analyzed by combining ones from engagement level with those from organization one.

Company management representative assessed the model and gave his insights in regards how the model can be put in the action. Based on two examples, it was clearly demonstrated the way model create basis for discussion and further assessment with questions like – how are we going to be sure that knowledge we just have documented in explicit way will be used in the next year and by as many engagements as possible?

The model is designed in such a way, to be understandable and easy to use for those, who have no IT background or technical experience. Model already demonstrated its’ potential during interviews with company employees in terms of seeking for new ideas of increasing the effectiveness.

# **DISCUSSION**

Knowledge management allow to drive business activity and increase the effectiveness of daily operations. Visualization of Knowledge management plays significant role, because they enable users to assess effectiveness of those systems, share their value with colleagues and create new ideas. Thus, there is an issue with building the model that would be appropriate for specific business processes - appropriate models can bring visible benefits. Thus, the problem of model design is crucial one.

Current research based on the case study and series of interviews. Case study represent the audit procedure in one of Big 4 audit and consulting companies and presented in a form of draft model. Empirical research is a deep interview, conducted among 3 experienced employees from Saint Petersburg office.

The reviewed version of the model presented and aimed at distinguishing main knowledge process elements. After analysis, there were 7 audit process elements and 6 organization level elements.

There were one deep interviews conducted with expert from Saint Petersburg, who were involved in management of audit process have gained respective knowledge management experience. The aim of interview was in identifying the applicability and limitations of built model.

Current study aims to introduce the defined tool in a form of knowledge management model, so that to enable management assess processes related to knowledge management. Close attention to those elements allows engagement teams to operate more efficiently and better in terms of speed and service quality.

Created knowledge management model suitable for Big 4 companies and any smaller audit and consulting company that follows general audit procedures.

Proposed model can be a base for further research in the current field and similar methodology. Moreover, it is necessary to update regularly the model, because IT-resources and processes may change with the time, as information technologies evolve.

Furthermore, study can be extended by observing procedures in different countries to address cultural differences. Additionally, knowledge application is separate topic that can be itself the distinct topic for research.

The last issue is that the knowledge management process was performed only from the audit process perspective. There can be added other processes from audit and consulting companies, which may add together to complete picture of Knowledge Management in the company.

# **CONCLUSION**

Business environment is developing very fast and audit and consulting companies have to develop even faster. Knowledge management is one of the solutions to innovate faster to be ready to meet new requirements from the Clients.

Biggest audit and consulting companies, well known as Big 4, are concerned about quality of Knowledge Management. In order to be able to assess the quality of Knowledge processes, clear model have great demand. Many researches performed on the topic of Knowledge management, for Big 4 companies as well. However, quick development of new business practices and lack of audit process model creates new challenge: how to design clear and understandable model of Knowledge management? There is a gap in examining the audit process from perspective of Knowledge management.

The purpose of the study is to fill the research gap and identify how Knowledge management model looks for audit and consulting companies. The aim of current study is to introduce model for audit process from perspective of Knowledge management, so that to enable management to assess knowledge management elements.

The research was based on case study of one of Big 4 companies and 3 conducted interviews with experienced employees of the company. These observations, analysis and outcomes presented in the Chapter 2.

As a result, Knowledge management model was created. Adjusted model after interviews feedback presented in the Chapter 3. The model is designed in such a way, to be understandable and easy to use. The applicability of model and important feedback regarding elements was defined and proved by expert’ opinion of Big 4 management representative experienced in the management of audit engagements.

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