VILNIUS UNIVERSITY
BUSINESS SCHOOL

INTERNATIONAL PROJECT MANAGEMENT PROGRAMME

Evelina Butkutė

MASTER 'S THESIS

ŽINIŲ VALDYMAS IR JO TAIKYMAS ĮGYVENDINANT PROJEKTUS LOGISTIKOS ĮMONĖJE GIRTEKA	*KNOWLEDGE MANAGEMENT AND ITS APPLICATION IN THE IMPLEMENTATION OF PROJECTS IN GIRTEKA LOGISTICS COMPANY*

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SUMMARY

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INTERNATIONAL PROJECT MANAGEMENT PROGRAMME

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Knowledge management and its application in project implementation has been increasingly gaining attention since the last few decades. Projects are one of the main sources of knowledge in any organization. Nowadays, companies that strive to remain competitive in the business environment, need to maintain knowledge creation, sharing and storing processes needed for project implementation by using technology that helps facilitate organizational and project learning.

Aim: To analyze knowledge management and its application in the implementation of projects in Girteka Logistics company.

Objectives:

1. To prepare theoretical background for the analysis on knowledge management in project implementation.
2. To analyze learning to create new knowledge in organization and in project implantation.
3. To analyze knowledge sharing methods in organization and in project implementation.
4. To analyze knowledge management technologies in organization and in project implementation.
5. To provide summary of knowledge management in organization and in project implementation.
6. To provide relevant findings for strengthening knowledge management in project implementation.

Research methodology. To achieve the aim and objectives of the study, literature analysis is provided, comparing opinions of different scholars. Qualitative research has been conducted, using the method of semi-structured interviews. The study is composed of interviews with 8 respondents, consisting of 3 knowledge management and learning experts and 5 project managers from the given organization.

Results and conclusions. Results of the study revealed that a consistent knowledge management process that is important for organization must also be applied in project implementation. The study concluded that project knowledge is useful at all organizational levels, and organizational knowledge is necessary for project implementation. These findings led to the recommendation that the knowledge management process must be aligned in all units of the organization. Meaning, it is essential to provide the same technology and possibilities for all project teams and employees to create, share and store their knowledge in organization and in project implementation.

This thesis may be useful for scholars studying project management or knowledge management sciences, as well as organizations that are interested in the analysis of knowledge management and its application in project implementation.

SANTRAUKA

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Žinių valdymui ir jo taikymui įgyvendinant projektus pastaruosius kelis dešimtmečius skiriama vis daugiau dėmesio. Projektai yra vienas iš pagrindinių žinių šaltinių bet kurioje organizacijoje. Šiandien įmonės, siekiančios išlikti konkurencingos verslo aplinkoje, turi palaikyti projektų įgyvendinimui reikalingus žinių kūrimo, dalijimosi ir saugojimo procesus pritaikant ir technologijas technologijas, palengvinančias ir organizacinį, ir projektinį mokymąsi.

Tikslas: Išanalizuoti žinių valdymą ir jo taikymą įgyvendinant projektus logistikos įmonėje "Girteka".

Uždaviniai:

1. Parengti teorinę analizę žinių valdymo taikymui įgyvendinant projektus tema.
2. Išanalizuoti mokymąsi, siekiant sukurti naujas žinias organizacijoje ir projektų įgyvendinime.
3. Išanalizuoti žinių dalijimosi metodiką organizacijoje ir projektų įgyvendinime.
4. Išanalizuoti žinių valdymui taikomas technologijas organizacijoje ir projektų įgyvendinime.
5. Apibendrinti žinių valdymą organizacijoje ir projektų įgyvendinime.
6. Pateikti išvadas apie žinių valdymo stiprinimą gyvendinant projektus.

Tyrimo metodika. Tyrimo tikslui ir uždaviniams pasiekti buvo atlikta literatūros analizė, lyginamos skirtingų mokslininkų nuomonės. Atliktas kokybinis tyrimas, taikant pusiau struktūruoto

interviu metodą. Tyrimą sudarė interviu su 8 respondentais - 3 žinių valdymo ir mokymosi ekspertai bei 5 projektų vadovai iš pateiktos organizacijos.

Rezultatai ir išvados. Tyrimo rezultatai atskleidė, kad nuoseklus žinių valdymo procesas, kuris svarbus organizacijai, turi būti taikomas ir įgyvendinant projektus. Tyrimo išvados atskleidė, jog projekto žinios yra naudingos visuose organizacijos lygmenyse, o organizacinės žinios yra būtinos įgyvendinant projektus organizacijoje. Darbe buvo rekomenduota žinių valdymo procesą suvienodinti visuose organizacijos padaliniuose, tam, kad visoms projekto komandoms ir darbuotojams būtų vienodos technologinės galimybes kurti, dalintis ir saugoti žinias organizacijoje bei įgyvendinant projektus.

Šis magistro darbas gali būti naudingas studijuojantiems projektų valdymą ar žinių valdymo mokslus, taip pat organizacijoms, kurios domisi žinių valdymo analize ir jos taikymu įgyvendinant projektus.

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INTRODUCTION

With the emergence of a modern approach to knowledge in the 20th and 21st centuries, knowledge is becoming a key non-monetary resource of companies and organizations. In organizations, different types of knowledge accumulate daily, and it is shared by using different methods, depending on the organization. Creating, sharing and storing knowledge without organizational guidelines and knowledge management process could lead to losing knowledge, which would lead to losing existing and accumulated skills, and technical/social knowledge base. Organizations that apply knowledge management processes for storing newly created knowledge in knowledge management systems and sharing it within different teams/departments, find themselves improved in the fields of: customer service, internal/external communication, product development flexibility, global market. Knowledge management processes aim at encouraging organizational units to create, share, store and learn from knowledge. In order to be successful, these processes must be implemented in project levels, too.

Even though the concept of knowledge management in projects has only developed in recent years, it has already been proven that innovative projects require the most knowledge, since their purpose is to replace old technologies/products with something new. Organizations often fail to store the new knowledge once the project is over, meaning it cannot be used in the future. Effective knowledge creation and sharing within projects of the organization, as well as knowledge storage in management systems have become essential for successfully completing projects. These procedures are also beneficial for: applying lessons from the past to increase the efficiency of the decision-making process, employing organizational history to use the time of the managers more efficiently, looking at the relevant past events when solving present challenges.

Knowledge management is becoming increasingly influential during project implementation, as it helps reach the objectives and supports other projects that will be implemented in the future. Thus, knowledge management in projects leads to successful project implementation and prospective benefits for the organization, as the collected knowledge will be shared in the future.

However, current examples of organizational projects prove the necessity for businesses to use knowledge management processes in projects. Companies must learn how to manage the knowledge that they acquire and accumulate during the projects more effectively. Furthermore, senior managers must create and govern a supportive project environment, management of knowledge being a part of it. Finally, businesses must think about how to indicate new knowledge, where to store it and recognize what knowledge still needs to be created.

Study aim: to analyze knowledge management and its application in the implementation of projects in Girteka Logistics company.

The objectives of the study are the following:

1. Analyze learning to create new knowledge in organization and in project implementation.
2. Analyze knowledge sharing methods in organization and in project implementation.
3. Analyze methods used for knowledge storing in organization and in project implementation.
4. Reveal summarized findings.

Research methodology: A variety of research methods was used to develop both the theoretical and empirical parts of the thesis. To reflect on the existing theory, different authors and scholars were selected, and their work was analyzed. In research, a qualitative method was used to collect information from selected respondents. Semi–structured interviews were conducted with 8 participants: 3 knowledge management and learning organizations experts and 5 project managers. The respondents provided insights on knowledge management and learning in project implementation.

Study structure. The thesis is composed of three parts. The first part focuses on knowledge itself and its types, knowledge management process, knowledge management system and learning importance in knowledge management. The theory helps develop the knowledge management process in organization that is later used during the research.

The second part of the paper provides the analysis of the importance of knowledge and its types in project implementation. Namely, what knowledge is created during project implementation and for what reasons knowledge management and learning are important in project implementation.

In the third part, the findings of the research are provided. The research model, based on the theoretical framework, is applied to Girteka Logistics company. This model targets organizational knowledge management and learning processes consisting of: learning to create new knowledge; knowledge sharing; knowledge storage and its use in project implementation. Research focuses on: creating new knowledge in organization and in project implementation; knowledge sharing methods in organization and in project implementation; knowledge storing methods in organization and in project implementation. After gathering and analyzing data on organizational level and project implementation, summary of results is provided.

In the final part, the concluding remarks of the research and recommendations for the company are proposed.

Study limitations. Despite the presence of several studies where the link between knowledge management and project implementation is analyzed, there is a limited number of academic contributions that investigate the parallel between them. Considering the practical relevance of these research areas, this study represents an attempt to narrow the knowledge gap, analyzing how knowledge management components and learning influence project implementation.

1. KNOWLEDGE MANAGEMENT IN ORGANIZATIONS

Knowledge in organizations is the application and productive use of information (Davis & Botkin, 1994). It is differentiated between explicit and implicit knowledge, organizational and individual knowledge. Definition of knowledge and its types will be discussed in this part of the paper.

Knowledge management is understood as a process to identify, develop, store, share, use and reuse knowledge across an organization. It focuses on building a culture of collaboration which upgrades an organization's knowledge (Debowski, 2006). In this part of the paper all the process elements will be discussed.

Knowledge management system (KMS) is used in organizations to cover storing, sharing and reusing elements in the knowledge management process. In this paper, KMS will be discussed as a part of the knowledge management process.

Learning and knowledge management are closely linked concepts. The key in the knowledge management system is a learning organization's enterprise that encourages people to grow, to share their knowledge, learn from each other or previously captured mistakes. Learning will be covered as a part of the knowledge management process.

1.1. Knowledge definitions and types

Knowledge as a term stems from ancient times, and it has been used in societies ever since. The first studies of knowledge as a concept, according to Kriščiūnas and Daugelienė (2006) was found in Greek philosophers' work. Plato (427–347 BC.) identified main defining characteristics, such as: knowledge must be *accurate and truthful*; knowledge can be only *objective* and *formulated from manifested truth*; knowledge must *accumulate further knowledge*; knowledge must be *memorized*; knowledge is *not senses* – symbols without understanding them cannot be interpreted as knowledge; humans *cannot know and not know* at the same time (Table 1, Classical approach). Kriščiūnas and Daugelienė (2006) claim that classical approach to knowledge, based on ancient philosophers' work, helps the researchers of today create knowledge theories that are relevant for contemporary societies (Table 1, Modern approach).

Today, in the fast-growing industries, knowledge in organizations is widely recognized as an asset for gaining competitive advantage (Armbrect, et.al., 2001). When defining knowledge, Gupta, Iyer, and Aronson (2000) build on Drucker (1969), Bell (1973), Toffler (1980), Ackoff (1989), Argyris (1993) Nonaka and Takeuchi (1995), other scholars. Summed up, *knowledge can be seen as a combination of experience, values, contextual information, expert insight, and reasoned intuition, which together create a platform for new experiences: gathering and assessing knowledge, acquiring*

and developing organizational competences. Hislop (2005) stresses the superiority of knowledge over information and data. The author observes that knowledge is formed by intellectually analyzing its components, namely information and data.

In the table below, today's management and economics theory about the modern approach to knowledge is presented by comparing it to the classical approach that was discussed above (Table 1).

Table 1. *Classical and Modern approach to knowledge*

Classical approach to knowledge	Modern approach to knowledge
Knowledge is representation of reality	Knowledge is explained by expertise processes
Knowledge is universal and objective	Knowledge interpretation is related to experience and context
Term's knowledge, information and data are synonymous	Knowledge is linked to data and information, but it is not the same
Knowledge is easily transferred	Knowledge is not easily transferred

Source: adapted from Kriščiūnas and Daugelienė (2006)

After comparing the classical view and modern approach, which will be used for further analysis in this paper, the main difference is clear. The classical view refers to "everyday knowledge", while modern – to "scientific knowledge". Kriščiūnas and Daugelienė (2006) claim that modern approach to knowledge is applicable to organizations, which is the reason why this definition of knowledge is relevant to this paper. After analyzing table 1 and the theory of Kriščiūnas and Daugelienė (2006), it can be concluded that according to the modern approach:

- Data, information, knowledge, and wisdom are different elements not only hierarchically, but also semantically.
- New knowledge is created by exploring and by gaining new experience (during the process of learning).
- Knowledge is complex, it is not easily transferred, and it belongs to every individual.
- Gain, creation, transferring and use of knowledge create economic and social added value.
- Organizations are open to knowledge; they reflect on challenges that are present in the market.
- Knowledge can be understood as the main resource of companies and organizations. Its creation, gain, use and transfer have an impact on how productive and knowledge-based activities are

produced. Thus, knowledge ensures their economical competitive advantage not only locally, but also in the international market.

Types of knowledge

Atkočiūnienė (2014) notes, knowledge classification can vary from one scholar to another. In this paper, when approaching knowledge by the way it is expressed (explicit and tacit knowledge), the classification of Polanyi (1966) and Nonaka and Takeuchi (1991) will be used. Meanwhile, when treating the application of knowledge, it will be referred to Probst, et al (2006). In the table below, every type of knowledge is explained in their practical use (Table 2).

Table 2. *Types of knowledge classified by its characteristics*

Level of expressing	Explicit	• Expressed by symbols (codified) • Can be easily transferred
	Tacit	• Experience • Intuition • Learning
Level of application	Individual (micro-level)	• Intuition • Experience • Skills • Psychological and physical being
	Organizational	• Human capital and relations • Technical knowledge management system • Management system • Values system

Source: adapted from Atkočiūnienė (2014)

Table 2 shows that knowledge expression can be classified as explicit knowledge (documented knowledge) and tacit knowledge (experience, skills, abilities, etc.). Tacit is embedded in human minds and work experience, often communicated personally, whereas explicit knowledge is codified and digitizes more easily and can be shared readily to use. Nonaka (1991) mentions that new knowledge

always starts with the individual. In any field, by using existing skills and knowledge, new knowledge can be created. However, the author stresses that to create value in an organization, individual knowledge needs to be shared, so it becomes common and accessible to others. To make it happen, an objective view of knowledge must be adopted. When viewing knowledge objectively, according to Hislop (2009), knowledge is understood as an "object" that people can manage. Since knowledge is mostly collected intellectually, for knowledge it is important to be:

- Codified (transforming tacit knowledge into explicit).
- Collected into knowledge management system.
- Structured/systemized.
- Managed technologically.

To sum up, for organizations, knowledge is a non-monetized asset, so this objective view is vital when creating an overall vision of knowledge and knowledge base. The above list indicates the main elements that are essential when companies aim to give employees autonomy in managing knowledge. The need for codification could be met by creating a knowledge management system and urging people to share their knowledge. Therefore, the process of knowledge management is important to be identified.

1.2.   Knowledge management process

Knowledge is becoming perhaps the most important non-monetary asset in any organization. In modern organizations, losing knowledge means losing existing and accumulated skills and technical/social knowledge base. Furthermore, it can lead to retention problems and declining competences of the employees (Tryon, 2012). Organizations are becoming aware of the importance of knowledge. Knowledge management process is essential to ensure that knowledge in an organization continues to be identified, developed, stored, shared, and systematically reused. The knowledge management process according to Meyer and Zack (1996) is presented in Figure 1.

Figure 1. Knowledge management process
Source: Adapted from Meyer and Zack (1996)

According to Probst, et al (2006), the knowledge management process, can be explained by the following elements, as shown in figure 1:

Knowledge identification

Knowledge management process starts with knowledge identification. Probst (2006) notes, it is important to index knowledge, and to do so according to the organization's knowledge environment – so every employee can find the knowledge they are looking for.

Knowledge development

According to Probst (2006), knowledge development adds to knowledge identification. When creating knowledge, it is important to build new skills, new products, better ideas, and more effective processes to create more organizational capacity.

Knowledge storing

When a competence/skill is gained, it will not be preserved without further effort. According to Probst (2006), if knowledge has potential value in the future, its' storing and regular maintenance are essential. Knowledge is stored by employing knowledge management systems and by using technology. Knowledge management system will be further discussed in section 1.2.1.

Knowledge sharing

According to Probst, knowledge sharing is one of the most important elements in knowledge management, because information must reach everyone for whom it is relevant. When sharing knowledge, learning is key – it is a procedure of identifying and modifying errors derived from distributing knowledge, opinions and suppositions about people and groups (Zappa & Robins, 2016). Learning and knowledge management will be further discussed in section 1.2.2.

Knowledge use

Probst (2006) notes, the purpose of knowledge management is to ensure that knowledge will continue to be used for further organizational improvement, be it decision-making or everyday activities. However, knowledge that is transferred and identified does not always reach its target audience. There are several obstacles that prevent fluent knowledge management process, leading to knowledge use, but when new knowledge is in use it is largely beneficial to an organization.

Gupta and Sharma (1994) emphasize that the benefits of knowledge management for the organization are wide-ranging. The organizational benefits may include the following:

- Customer service is improved, communication is more efficient and less time-consuming.

- Products are developed faster.
- Employees are encouraged to work more efficiently.
- Higher quality products are developed and delivered.
- Increased flexibility and adaptability in the global market.

Knowledge renewal

In the renewal process, according to Probst (2006), decisions must be made whether present knowledge is still applicable, if knowledge must be utilized or restructured for future use. Learning can enhance the organizational capability of recognizing and seizing new opportunities. Learning and knowledge management will be further discussed in section 1.2.2.

To sum up, knowledge management can be defined as the wealth of intellectual assets within an organization. When knowledge management process is advanced by applying technology and tools, knowledge management systems can be implemented. It leads to new knowledge creation techniques, more creative decision-making, more effective knowledge sharing. Knowledge management system will be further discussed in section 1.2.1. Knowledge management promotes organizational learning. Learning and knowledge management will be further discussed in section 1.2.2.

1.2.1. Knowledge management system

Knowledge management system is a technological tool, used for gathering all the knowledge that flows in an organization. It consists of both individual and organizational skills and it is being constantly improved by learning. In knowledge management systems, data and information are not synonymous to knowledge – they differ semantically and hierarchically (Hislop, 2005). Meaning, data is facts; information is the aggregation of data – organized and created by people and technologies; knowledge is the understanding of information – synthesis of data and information, useful when making decisions (Alstete & Meyer, 2020). Knowledge is the active use of information, and it is more important for drawing conclusions and decision-making.

Knowledge management systems aim to codify tacit knowledge and by using technology, collect it in knowledge management system to deliver the right information at the right time to the right people. It is very important for knowledge and learning to be stored – for both people and organizations (Alstete & Meyer, 2020). In organizations, knowledge accumulates every day, and when stored, it can be used in the future: for operating reasons, reporting or else (Huber, 1991).

Huber (1991) indicates, most of the time organizations are not aware of the knowledge they possess, and this problem could be solved by incorporating computers for storing organizational memory. In knowledge management systems, the computer-based solution is key – to resolve

knowledge loss resulting from employee turnover, to avoid losing knowledge in the future. Other benefits of knowledge management systems include (Alstete & Meyer, 2020):

- Using past lessons to increase the efficiency of the decision-making process.
- Applying organizational history to use the time of the managers more efficiently.
- Looking at the relevant past events when solving present challenges.

Knowledge management system and according to Probst, et al (2006), is composed of the elements presented in figure 2.
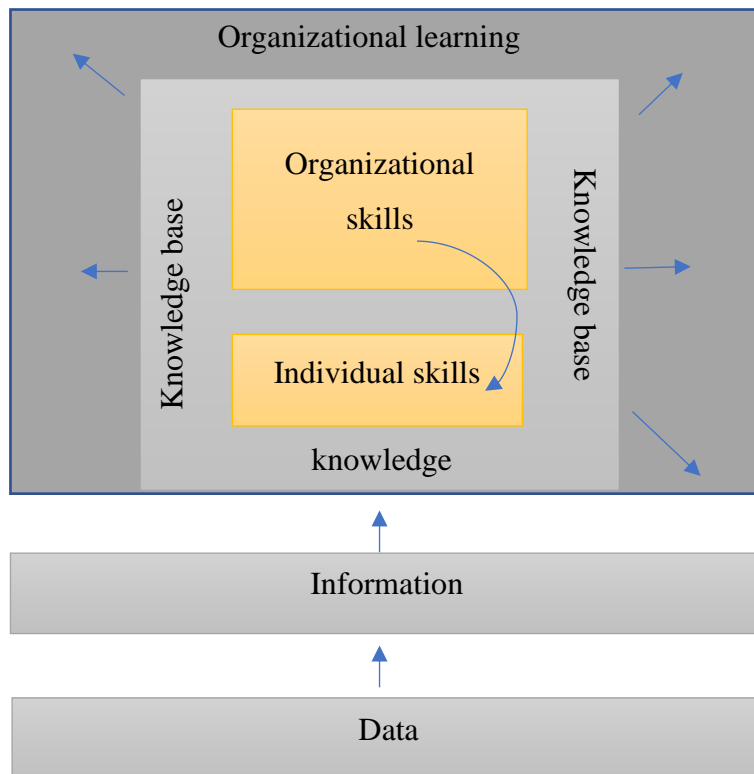
Figure 2. Organizational knowledge management system structure
Source: Adopted from Probst, et al (2006)

Data and information come in the picture before knowledge is formed, thus the two elements are essential to look at when discussing knowledge creation. Organizational and individual skills are a part of knowledge management systems – meaning, employees' interactions with knowledge are important. According to the authors, with their skills, every individual that partakes in a knowledge management system process, becomes the main knowledge agent. However, their experience and knowledge are not the only type of know-how in an organization. Collective knowledge is shaped by organizational skills – the skills that come from learning, depending on the learning process of a company. If organizational processes reliant on learning are planned accordingly, and employees contribute, the organizational skills are shaped, becoming a collective element in the knowledge base. Knowledge base, also known as knowledge management system, is a collective knowledge asset, used

by an organization when solving tasks and problems. Knowledge management systems store data, information by which individual and organizational knowledge is created.

To conclude, a knowledge management system is a sum of individual and organizational knowledge assets that an organization uses when accomplishing tasks. It also includes data and information, out of which individual and organizational knowledge is built. In knowledge management systems, changes are constant, and they rely on organizational learning.

1.2.2. Learning in knowledge management

Learning is a process of gaining knowledge and developing skills, competences that lead organizations to compete amongst each other more efficiently. When relating learning, knowledge and knowledge sharing, Choo (2006) proposes an insight: in an organization, learning requires the ability to collectively reflect on actions and experiences with a desire to challenge current beliefs and modify them, if necessary.

According to Argote (2011), the main components of the learning process include knowledge acquisition, storage and retrieval. When knowledge is transferred from one unit to another, such knowledge transfer affects both units (Argote & Ingram, 2000). According to Probst et al, knowledge management system is a byproduct of organizational learning. Huber (1991) claim that organizational learning is a dynamic process based on knowledge found at different levels. Knowledge flows from individual to the group level and the organizational level, and back again – in other words, creating organizational learning process (Figure 3).
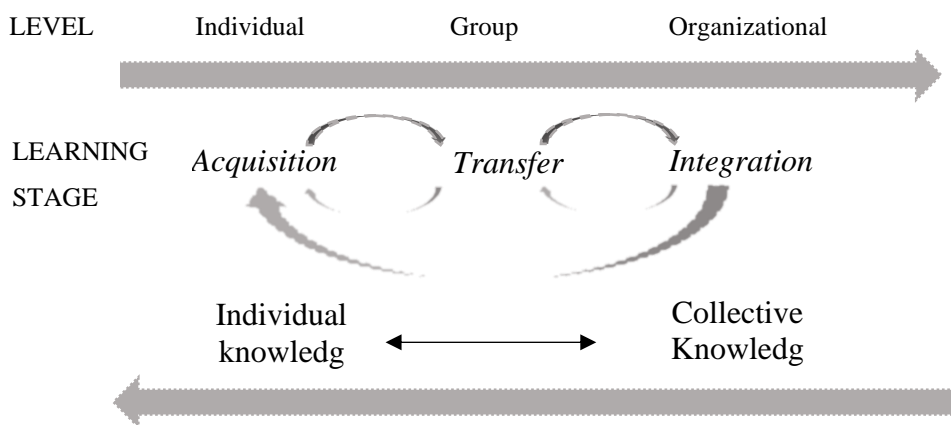
Figure 3. Organizational learning process
Source: adapted from Gomes, Lorente and Cabrera (2003)

According to Gomes, Lorente and Cabrera (2004), learning process (Figure 3) is about:
- Knowledge acquisition and creation, its integration within the organization (as a strategic resource in organization.

- Newly created and shared knowledge means that there are constant internal changes in organization, found not only in the behavior, but also in cognitive memory of individuals.
- Internal changes lead to improvements that allow the organization to maintain or gain competitive advantage given the organization's capabilities.

Learning to create knowledge

Learning organization is a construct that indicates the level of knowledge created and shared within an organization. According to Garvin, Edmondson, and Gino (2008), when assessing to what extent an organization is a learning organization, companies can point out areas where they need to improve knowledge sharing, idea development and learning from mistakes. Authors add, in learning organizations employees are motivated to create, acquire, and transfer knowledge.

According to Gupta and Sharma (2004), intangible assets such as knowledge, information and technology will keep growing as long as they are being shared and applied. Furthermore, organizations that can create knowledge and learn are able to evolve at a faster pace, which gives them a competitive advantage in the market. Referring to Draft (1998), authors claim, organizations that learn in the fast-changing environment, gain competitive advantage by continually redesigning themselves into learning organizations. Transformation into a learning organization, according to Gupta and Sharma (1994), will help foster knowledge creation and later, sharing. Thus, while knowledge management refers to creating and keeping collective knowledge stored in the organization, the term learning organization refers to becoming skilled in creating, sharing knowledge by applying the new knowledge and insights. As explained by Marsick and Watkins (1999), there are seven dimensions of learning organizations (Figure 4).
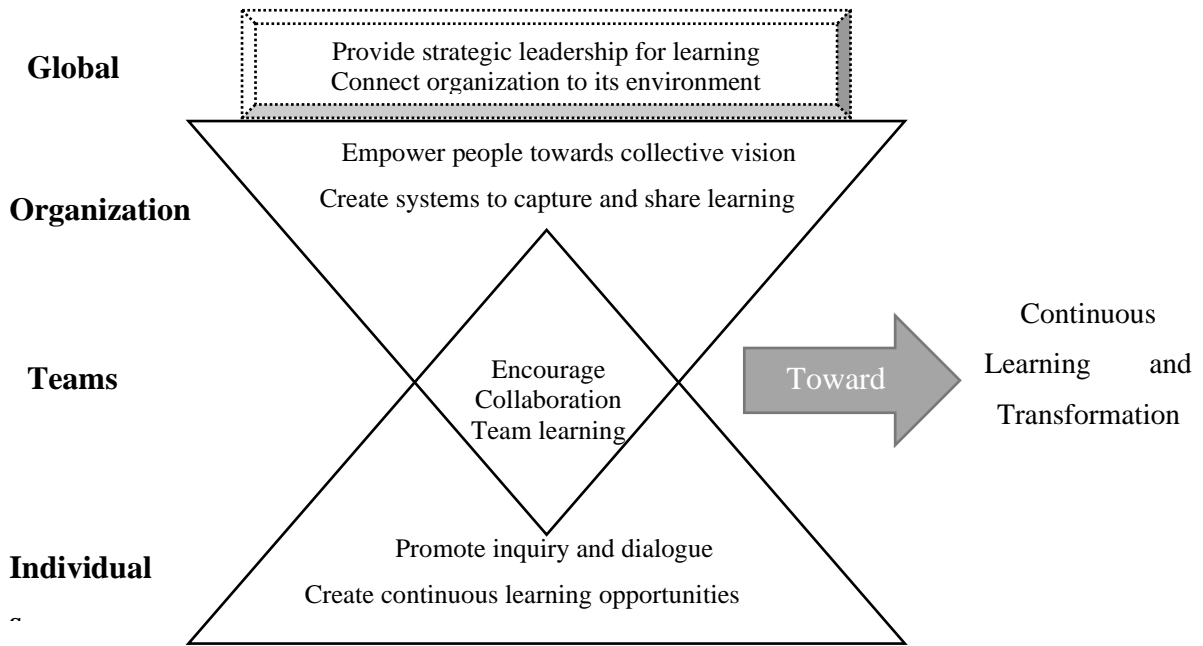
Figure 4. Learning organization dimensions

Source: Adapted from Marsick and Watkins (1999)

In Figure 4, a learning organization is pointed out as having entrepreneurial, flexible, organic culture and facilitative leadership; learning organizations focus on creating knowledge, facilitating individual and collective learning; such organizations act, reflect and adjust while are willing to learn on how to transform and change. In Table 3, the dimensions of a learning organization provide main areas of the learning organization. Dimensions, described by Marsick and Watkins (2003) was created to assess changes in knowledge performance. It includes continuous learning opportunities, promoted inquiry and dialogue, encouraged collaboration and team learning, analysis of systems that capture learning, people empowerment toward collective vision, connected organization to environment, and provided leadership for learning (Table 3).

Table 3. *Definitions of constructs for the learning organization*

Dimension	Definition
Continuous learning opportunities	• Learning is a part of work • Opportunities provided for ongoing education and growth
Promoted inquiry and dialogue	• People gain for skills to express their views • Capacity to listen and reflect on the views of others • Work culture supportive of curiosity, feedback, experimentation
Encouraged collaboration and team learning	• Work in groups to access different modes of thinking • Groups working and learning together • Collaboration is valued and rewarded
Analysis of systems that capture learning	• Technological systems are used in everyday activities • Access provided • Maintenance available
People empowerment toward collective vision	• Employees are involved in implementing joint vision • Employees are motivated to learn what they are held accountable for
Connected organization to environment	• People are assisted to see the effect of their work on the entire enterprise • Organization is linked to the community
Provided leadership for learning	• Leaders follow a model supportive of learning • Learning strategically to improve business results

Source: Adapted from Marsick and Watkins (2003, p. 132-151)

To conclude, learning is an organization's capacity to process – to create, share and integrate – knowledge. When it is used in practice, not only overall behavior in organization changes, but also the overall performance of an organization is improved.

2.   KNOWLEDGE MANAGEMENT IN PROJECT IMPLEMENTATION

According to Tryon (2012), projects are the most significant source of new knowledge in any organization, that new knowledge often is a byproduct of project activities. It can be said that innovative projects require the most knowledge, since their purpose is to replace old technologies/products with something new. However, authors stress that organizations often fail to store the new knowledge once the project is over, meaning it cannot be used in the future. In this chapter, it will be discussed what kind of knowledge is created and is shared during project implementation, as well as successful outcomes that knowledge management can bring to project management.

2.1.   Types of knowledge shared in project implementation

According to Gasik (2011), knowledge is the most important resource needed for a project to be successfully implemented. Also known as project knowledge, this type of knowledge is one of the characteristics that all projects have in common (Sankarasubramanian, 2009). For organizations that understand knowledge as the "mind" of the organization (companies that have higher levels of knowledge management practice), effective knowledge sharing becomes essential for successfully completing projects.

To broaden the understanding of each type of knowledge in projects, Table 4 provides possible definitions, according to different authors, as well as practical examples.

Table 4. *Types of knowledge creating in projects*

TYPE	FORM	DEFINITION	EXAMPLES
Knowledge within projects	Overview of the project.	Knowledge within project.	Individual, project team tasks. Activities across project.
Knowledge between projects	Expert knowledge. Methodological knowledge Procedural knowledge. Experience Knowledge.	Total knowledge possessed from overall the project in organization.	Good practices, templates. External forums. Relation with other projects information.
Explicit Knowledge	Documented.	Knowledge about things and facts.	Technical knowledge. Meeting minutes. Project plans. Instructions, etc.
Tacit Knowledge	Uncodified experiences and skills of the team members.	Linked to experience and cognition.	Workshops, Meetings.

Source: Composed by the author

Knowledge can vary in its types from tacit to explicit (Table 4). According to Morris (2004), in project management both – tacit and explicit knowledge – play a decisive role in the understanding processes. Such differentiation helps to develop and apply mechanisms for managing knowledge. Hanisch, Linder, Muller and Wald (2008) explain, tacit knowledge can be transformed into explicit and transferable knowledge, meaning that all the types of knowledge are relevant in project implementation.

Harnish, Linder, Mueller and Wald (2009) categorize knowledge in projects into knowledge within projects and knowledge between projects (Table 4). Knowledge within projects contributes to performing tasks within a project, and knowledge between projects contributes to learning at the organizational level. Knowledge may change its form at different stages of the project cycle (Schindler and Eppler, 2003). The organization must determine what kind of knowledge is required. In Figure 5, the process of project knowledge flow in an organization is shown. First, the organization indicates a need for knowledge and its types. Second, tasks and required knowledge are identified at a project level. Third, team members transfer the created knowledge back to the project level. Fourth, the project team formulates the accumulated knowledge that is shared in the organization.
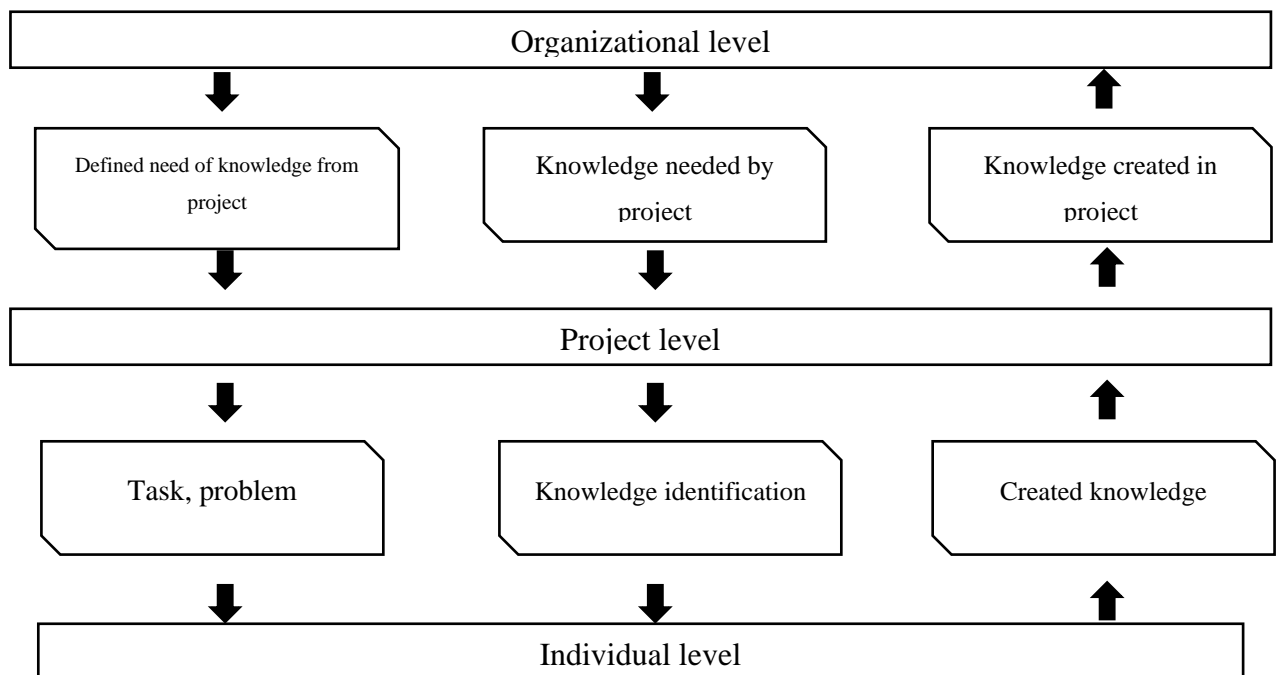
Figure 5. Vertical knowledge sharing mechanism.
Source: adapted from Gasik (2011*)*

On the individual level (Figure 5), employees get tasks from project authorities, identify required knowledge and eventually attain new knowledge that is being stored at a project level. On the project level, all the knowledge that is required from the organizational level is collected during the execution phase. It increases not only the capabilities of the project itself, but also the capacity of the

whole organization (Gasik, 2011). This is the aim of knowledge sharing in the projects – to execute the projects more effectively in all levels.

To conclude, according to Gasik (2011), knowledge is a resource that must be passed on – shared. Knowledge sharing is an act of communication between two specific subjects: sender and receiver; these roles can vary between individuals and project teams or organizations (Alavi & Leidner, 2011). Thus, knowledge not only has to be created, but also it must be prepared for sharing – codified (explicit) or, in other words, documented. Sharing documented project knowledge is necessary, because explicit knowledge is a type of knowledge that is stored and maintained for the future use. When codified, it is easy to find, use and reuse for future purposes on both project and organizational levels.

2.2. Knowledge management and learning solutions in project implementation

Projects in companies are often complex and temporary. In some cases, it is difficult to manage project knowledge. It can be challenging for the project manager to complete their tasks, as well as find the right way on how to incorporate knowledge creation, sharing, learning practices in their daily work. According to Hanish, Bastian, Linder and Frank (2008) projects can be described as:

- Unique and singular
- Always changing workforce in project differentiation
- In many cases they are short oriented
- People that work in projects must quickly adapt to changing conditions and contents of work
- Projects lack organizational memory, routines, and other mechanisms of organizational learning.

Based on these characteristics, the importance of securing the project knowledge for the overall organization is clear. Love (2005) and Davendport and Prusac (1998) indicate the necessity of securing such knowledge from a business perspective. To begin with, it is important for companies to learn how to manage the knowledge that they acquire and accumulate during their projects more effectively (knowledge transferring and sharing practices in projects). Furthermore, senior managers must create and govern a supportive project environment, management of knowledge being a part of it (learning culture incorporated in project activities). Finally, businesses must think about how to indicate new knowledge, where to store it and what to create (organizational memory usage in project activities).

Concept of knowledge management in projects developed in recent years. Knowledge management in projects is a process, during which knowledge management is being practiced in project situations (Hanisch & Linder & Muller & Wald, 2008). In A Guide to the Project Management Body of Knowledge (PMBOK® Guide), managing project knowledge is described as a process of

"using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning. The key benefits of this process are that prior organizational knowledge is leveraged to produce or improve the project outcomes, and knowledge created by the project is available to support organizational operations and future projects or phases. This process is performed through the project." (Project Management Institute, 2018, p. 98). Therefore, knowledge management is important for a project to reach its objectives, meanwhile sharing that knowledge is essential to support organizational projects that will be implemented in the future. Thus, knowledge management in projects leads to:

1. Successful project implementation.
2. Prospective benefits for the organization, as the collected knowledge will be shared in the future.

When businesses find a way on how to incorporate knowledge sharing practices, learning culture and knowledge management system in the project activities, benefits and relevance become apparent. Love (2005), when speaking of relevance, claims, knowledge is acquired by learning from failures or successes that occur during the projects. Regardless of it being explicit or tacit knowledge, it is vital for the long-term sustainability and competitiveness of a business, and it is necessary for a project's success in today's dynamic and changing environment. When discussing knowledge management in project environments, Hanisch, Linder, Muller and Wald (2008) build on Schindler's (2002) explanation. This framework of project knowledge management consists of three types of knowledge: knowledge about projects, knowledge in projects and knowledge among projects.

- Knowledge among projects is closely linked to the project management methodology and the communication practices in projects.
- Knowledge about projects is an overview of projects in a company.
- Knowledge in projects consists of different types of knowledge that contribute to the knowledge management system.

The elements are given in a Figure 6 below.
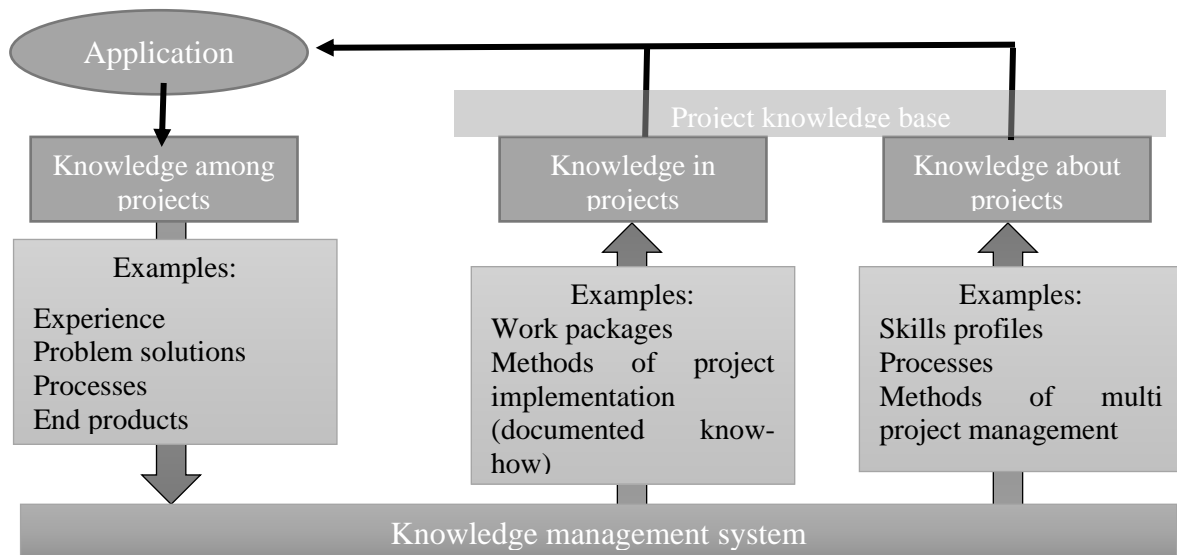
Figure 6. Schematic diagram of types of knowledge-flows in project context

Source: adapted from Schindler & Damm (2002)

Figure 6 shows the knowledge elements within the different categories of project knowledge. The examples prove that knowledge in, knowledge about, and knowledge from projects can belong to different types of knowledge – explicit or tacit. It also shows that the types of knowledge differ at different stages of the project's life cycle. The knowledge sharing among projects can be referred to as expert knowledge, methodological knowledge, procedural knowledge, and experience knowledge, contributing to the knowledge management system (Hanish & Linder & Muller & Wald, 2008). Knowledge in and about projects can only be created from current documentation that has been gathered from the knowledge management system. Therefore, project knowledge base with relevant information could be added.

The problem with projects sharing knowledge is the lack of learning. Meyerson, Weik, and Kramer (1996) note that the temporary and customized nature of projects pose difficulties for learning and growing knowledge from one project to another. Swan and Scarbrough (2010) suggest that problems related to knowledge sharing and learning in projects may vary across different organizational contexts. It is presumed that if organizational learning and knowledge transfer processes are present in an organization, such organization will have knowledge management system and will practice organizational learning. Organizations that have a mature level of knowledge sharing techniques and learning are likely to have knowledge management systems for their projects.

All these things considered, knowledge management and learning are processes that pose several obstacles but can benefit companies and projects in many ways. In this section of the paper, it was found that some knowledge is directed at project activities, while the rest supports organizational need for having a knowledge management system of project successes, failures, and other information.

Sharing knowledge among projects is important because if relevant knowledge is stored in the knowledge management systems, different teams can learn from past experiences of others.

Theoretical framework consisted of two sections. First, aspects of knowledge management were analyzed. It has demonstrated to be beneficial when growing future decision-making capacity. Also, built-in knowledge management systems create a more motivating work environment while indicating learning needs in the process. Second, project implementation shows the success of knowledge management, proves whether the organization is capable of learning. To sum up, to achieve competitiveness and improve the efficiency of project implementation, it is beneficial to strengthen the existing knowledge management components such as knowledge creation, knowledge sharing, knowledge storage, and learning processes at all stages of project implementation.

3.   RESEARCH METHODOLOGY

Knowledge management process components in organization are gaining importance in functional units of organization and improving its projects implementation process. Temporary nature of projects makes effective knowledge creating, storing, sharing more challenging, but if organization has strong learning culture, knowledge management in project implementation can bring positive results.

3.1.   Research model

Conceptual research model was created according to the theory and study objectives:

1. To analyze learning to create new knowledge in organization and in project implementation
2. To analyze knowledge sharing methods in organization and in project implementation
3. To analyze knowledge storing methods in organization and in project implementation.

The framework was divided into two main sections: knowledge management and project implementation, both being clarified according to learning to create new knowledge, knowledge storing and knowledge sharing aspects. Model is given in Figure 7.
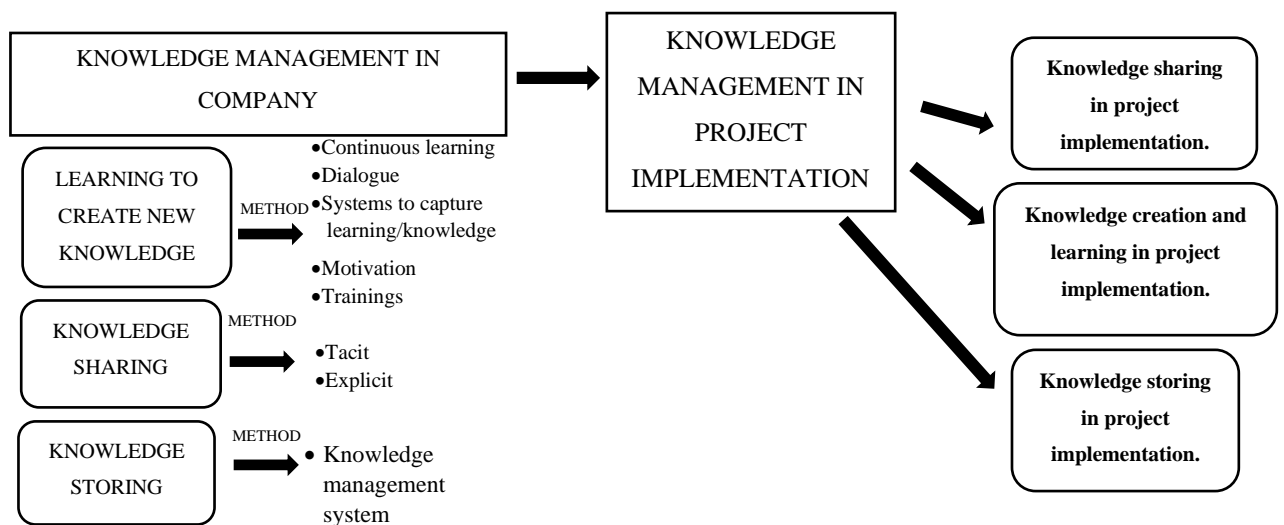
Figure 7. Learning and knowledge transfer cohesion in organizational learning and project implementation
Source: composed by the author

In the model learning is as a wholesome of methods that helps create new knowledge in organization and projects. All the mentioned methods: continuous learning, inquiry and dialogue, systems to capture learning/knowledge, motivation and trainings are linked to learning and creating new knowledge in organization.

In this model knowledge sharing is divided in two types of knowledge - tacit and explicit. Explicit is codified by such techniques as documenting knowledge, creating project plans, writing out deliverables, whereas tacit is informal way of communicating, general communication and skills that are not documented. In theorical part it was acknowledged that both tacit and explicit are important in organization transferring its knowledge, in model both types are present. In research informants must identify what kind of knowledge they created during each stage in their project implementation.

Knowledge storing refers to the system that captures and stores organizational knowledge and helps employees to learn and transfer knowledge.

3.2. General aspects of qualitative study

For this research **qualitative type of research is used.** According to Luobikienė (2010) interpretation on Creswell (1998, p. 14-17), qualitative research is a process of understanding problems from individual (subject) perspective. Researcher that constructs holistic framework of the topic, analyses informants' words and beliefs, gets his\her conclusions in informants' natural habitat. For this case it is a suitable type for research because problem must be addressed in full-scale: two-phased research must be conducted to the professionals of fields; conclusions does not have to be delivered in numbers, but as processes that are present; experts' opinions on research goal will give broader understanding about the topic.

For this research descriptive research typology is used. According to Luobikienė (2010), this type of research helps to characterize more comprehensive information, which in our case are two-phased research examining several standpoints. Luobikienė (2010) also adds up that descriptive research helps to evaluate, compare, and parallel several characteristics by illustrating their interconnection. By planning such research, Jadovas (1987, p. 58) *Principle Researched Plan Singularity* table was used. To achieve all plan phases, research goal was formulated; technique was chosen as a **qualitative** type of gathering information from subjects; research method was chosen as **interview**.

3.2.1. Research sample

Researched company. Research will be carried out in logistics company "Girteka Logistics". It was chosen because it has features inside the company that are fulfilling the goal of the research:

- Company has learning and development division for improving organizational learning to create knowledge, systems to store knowledge, and knowledge sharing in organization.
- Company established organizational memory tool in 2020 and started investments in knowledge sharing practice.

- Company has about 80 strategic projects yearly and a greater number of projects that accumulates in organization.

Sampling method. Research sample was prepared according to Valeckienė and Mikėnė (2010). Guidelines for the research were grouping of respondents – selecting respondents that were a target sampling. Selecting typical examples in qualitative research helps target individuals who are closely related to the topics:

1. Knowledge management and learning in organization – learning experts that can give an expertise on mentioned topics in organizational matter.
2. Knowledge management and learning in project implementation – project managers across the company who are working on different projects.

When seeking for homogeneity it is important to choose small group for people but selected deliberately for research conclusion to be accurate.

Interviews were conducted with 5 project managers and 3 experts on knowledge management and learning. In this paper abbreviations given in the Table 5 will be used to mention respondents.

Table 5. *List of respondents*

P1	Strategic SAP project PM.
P2	IT project PM.
P3	P&C project PM.
P4	Strategic transport project PM.
P5	Operational excellence project PM.
E1	Head of Training Center division
E2	Continuous improvement manager
E3	Project management process expert

Source: Composed by the author

3.2.2. Research method

In this research **semi-structured** method of **interviewing** was used. According to Luobikienė (2010, p.79-85)

- Structured interviews are questions that have defined answers beforehand – it does not give much freedom of choice for informant but accumulates rational and neutral answers that helps to find indiscrete answers.
- Unstructured interviews are open questions that helps to get more complex view of the case. It helps to get closer to the environment and respondents; get informants trust and find connection with them; gather empirical information for future analysis.

Research instrument. Interviews for respondents were **divided into categories**:

Questionnaire 1. Knowledge management in organization:

- Continuous learning
- Inquiry and dialogue
- Systems to capture learning
- Motivated/empowered employees
- Provided strategic leadership for learning.

Questionnaire 2. Knowledge management in project implementation:

- Knowledge creation and learning
- Knowledge sharing in organization
- Knowledge storing
- Problematic and sense of knowledge project management processes.
- Knowledge sharing in project implementation (Table 6):
  - Created knowledge
  - Shared knowledge
  - Method for created knowledge
  - Stored in organization.

Answers about knowledge sharing in project implementation will be collected by using method shown in Table 6.

Table 6. *Knowledge sharing in project implementation*

Knowledge sharing in project phases.				
KS through the project phases.	Created knowledge	Method for creating knowledge. (Tacit/explicit)	Stored.	Shared with other projects.
Initiate				
Plan				
Execute				
Monitor and Control				
Close				

Source: Composed by the author

Full questionnaires are given in appendices with an example of interview and list of questions (Table 19 -21).

3.2.3. Data gathering process

By referring to the conceptual research model (Figure 7), the reseach was divided in two phases (Figure 8) the answers on knowledge management in organizations was gathered from knowledge and learning experts and project managers. Data gathering process model shows that to find saturation in knowledge management aspects, it is important to gather information from organization point of view and project implementation point of view on knowledge management process (Figure 8).
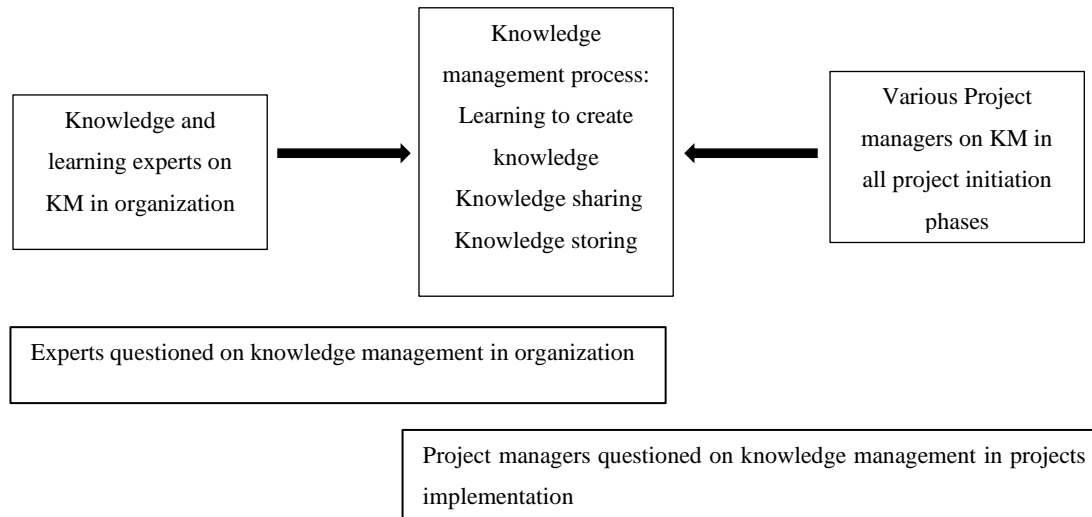
Figure 8. Data gather process for questioning
Source: composed by the author

3.2.4. Data analysis methods

Because interviews were performed using video conference calls data analysis was done by analyzing recorded interviews. All the video material was transcribed and later categorized and shortened to the most valuable text. It led to compare the answers and see relevant patterns for the objectives of the research. An example an interview given in appendices, Table 19.

4. RESEARCH RESULTS

Empirical research results showed main variables that goes along with research objectives that was also indicated in the research framework. Aspects that will be presented is given in this chapter is linked to research objectives.

Analysis on learning to create new knowledge in organization was oriented on how learning influences new knowledge creation in organization while mentioning learning mechanisms, learning adaptation, and creation of sustainable culture to maintain people motivation. In project implementation, the analysis stressed out internal trainings and time for learning, that helps project managers to create new knowledge and share it with team members. The overall problems when creating new knowledge in project implementation were concluded.

Analysis on knowledge sharing methods helped to determine technologies used in organization as well as in project implementation, like knowledge management system and project management system, SharePoint, also, internal training programs that provides learning programs for employees and trains how to use technologies in organization. It was given, that knowledge sharing steadily starts to be one of the main components for driving projects in organization but still lacks determined knowledge sharing process.

Analysis on knowledge management technologies in organization helped to determine that used technologies store codified information, track on important problematic areas that occur in a company; it also helped to indicate future perspective for developing tools into more advantageous way. It was determined, that in project implementation, project teams and managers used technologies for knowledge management but not all projects were included into knowledge management system and used old technologies instead.

The summary of results helped to compare knowledge management in organization and project implementation. It helped to determine knowledge management processes similarities and differences in organization and in project implementation and proposed possible improvements.

4.1. Learning to create new knowledge in organization

In interviews about knowledge creation and learning aspects in organization the interviewees positively responded on knowledge creation culture. Interviewees that were representatives from different departments, gave their expertise from their own experience and on organizational scale. The answers that were given brought to the clearer perspective on knowledge creation and learning aspects that occur in Girteka Logistics. As questions varied from knowledge creation to general learning, it became clear what organization is lacking and what could be strengthened in the future; also, respondents gave a glimpse to the future that awaits company in learning field.

Table 7 shows what methods were used for learning and how it occurs when new knowledge is created.

Table 7. *E1, E2, E3 respondent results on learning and knowledge creation in organization*

	Organizational culture		Time devoted for learning		Discussion within teams		Technological improvements		System to encourage learning
Learning	- Praising system. - Open forums. - Speak up.		- Girteka learn system. - There is time devoted to learn.		- Weekly meetings. - Monthly meetings. - Overall discussions.		- New systems - New training programs. - New methodologies. - Continuous improvement. - Technological improvements.		- Lean methodologies - Kaizen.
Knowledge creation	- Giving feedback. - Discussing between employees and organization. - People asking why.		- New skills for growth identification.		- New knowledge captured inside teams. - Daily/weekly meetings.		- New platforms for knowledge storing.		- Lean methodologies. - Asaichi. - Kaizen.

Source: composed by the author

To analyze data given in table 7, the explanations gathered from experts are given below.

Organizational culture

Learning:

E1 mentioned praising system: *„ We can praise our colleagues; also, we have leadership endorsement program application so we can do that as well (…)also there are open forums where people can leave feedback even to the managers, and they can do it anonymously ".*

E1 mentioned open forums. *open forums come or Townhalls happening every quarter where people exchange their success/failures, also with these anonymous questions can be very various: from money aspects to transport activities in some townhalls questions are given non-anonymously.*

E2: *"Speak up, encouraging open questions, while the management tries to answer those questions as clearly as possible."*

Overall culture in organization can be determined as a cultivating variable.

Knowledge creation:

E1, says there is communication between employees with work related questions to form new knowledge: "*I think that yes. So, people aren't afraid in our organization. People are not afraid to to give feedback, to provide feedback, to approach other people and discuss it. "*

E1 claims, discussions are present between employee and organization via LEAN methodology creating new knowledge: *„I think yes, uh, we as well. We encourage people asking why, because of lean methodology we have in the organization as the most important method. Via 5s method where organizational units can find the answer to the questions regarding any problem. If they see the problem they ask: Why and try to improve the process, write documentation about it. So, it's in our roots, I think asking why is in everyone's ability regardless of their rank, regardless of their position ".*

Time devoted for learning

Learning and knowledge creation:

E1 claimed, that people develop skills and competences, creates knowledge: "*In my opinion, yes, people have time to develop skills and competences. We have meeting, that is called 3s, scheduled each year, at least once a year, you meet with your manager and decide on your improvement points on what you need to learn and what competence you need to grow. Then you need to discuss if it will be internal training, or external/books and you decide on time for that learning. You also discuss this time during one on one with your manager, when it would be the most appropriate to learn; if it is not learning course, but a book, you can still do that and set aside some time for trainings. Organization is not giving you official hours on trainings, but you can always talk to manager and ask to get that time.".*

E2 builds on the idea of time for learning and confirms, that even some activities have learning as a KPI to measure their weekly performance. *"In my practice, yes, we all have dedicated hours for informal and formal learning. Also, Russian activity had official KPI in their strategy cascade: time devoted for learning, and I am afraid if I lie, but as I remember the hours were indicated for going to Girteka Learn and gain some skills about organization, devote time for this. Russians kept track on attendance rate, but now I hear more and more about the importance on learning, so the systematic learning becomes as a thing for our company".*

Discussions within teams

Learning:

E2 said that learning comes from discussions and weekly meetings *"We have weekly meetings; we have mutual chats! Helping each other and writing about their problematic. If someone has problem, they write it out and everyone gives a lot of advice and resolves it. It is normal practice in Girteka – monthly meets where we can indicate what we would like to discuss during this time; weekly for overall discussions; chats for problems on demand".*

Knowledge creation:

E1 said that new knowledge can be captured inside the teams: „*There is a process here in Girteka that once a week every team has a team meeting, it is a great place not only to receive information, but to discuss achievements and problems. We have daily or weekly meetings where we have a place for officially raise problems and as well to celebrate achievements. We can either capture minutes or identify what has to be filled into work instruction forms, put in Confluence."*

Technological improvements:

Learning:

H2 claims felt a lot of technological improvement to learning this year, mentions core value of organization that is linked to learning. *"In this year it was very present. A lot of new systems, a lot of new improvements, new training programs that are internal, investments in new methodologies such as TWI, process tool etc. When we do it internally it feels on the whole organization. (…) Also, there are managers that would look for new opportunities for technologies, it feels that sometimes there is an urge from organization to develop, to do more and to thrive for technological improvements as much. We even have value – continuous improvement. Organization understands learning as improvement and when you seek perfection, you will have to learn. Try, learn and just ten adapt – and these three parts are continuous learning. I saw this in our organization this year and next year I believe it will be even more present."*

Knowledge creation:

E3 was oriented to the tools from project management perspective: "*Questions for knowledge creation for me is associated only with project knowledge – budget plans, lessons learned, project management information. I started working here two years ago and during that time in confluence I created knowledge about project management cycles. Most of my information as a system for creating platform to have some place for project managers to identify, yes you can say that information about projects came from endless discussions with my colleague that helps me run project management program implementation plan.*"

System to encourage learning:

Learning:

E1 says that organization has Kaizen system, but it is not oriented to rewards. „*At the moment, yeah, we don't have any other systems that would encourage people and would give any rewards that.* "

E2 adds that there is a lot of learning, but not much rewards that could encourage it. „ *We teach others, give the package of learning for other, but we do not get anything in advance. And even when thinking about kaizen – it is used to improve process, document, standardization etc., but not about learning and helping other employees to improve some of their skills. Well, if I go back to learning, what is reward? In Girteka Learn I remember batches for learning, but you know – it is just symbolic. Maybe diplomas for learning? Monetary reward was never present. Systems that have potential are in present – lean methodologies can encourage learning but there is no reward for that.* ".

Knowledge creation:

E1, for knowledge creation, mentioned that organization is obtaining LEAN practices and named Asaichi as a daily/weekly routine for gathering information about the biggest problems that are surrounding employees. "*In some cases, yes. In some cases, no. But in our organization, we have the lean methodology implemented and during ASAICHI meetings every morning you can see the KPI and KPI might be green and might be red. So, if the KPI is RED, it means that something is not going well. So usually, these problems are being discussed openly within a group and identified. So, I think that my answer would be yes, that we encourage identify knowledge - by encouraging employees to speak about their mistakes and try to find the solution so that it wouldn't be repeated in the future. Also, let's say if I have a problem, if I did a mistake or thinking of improvement, I usually will go to my direct manager and we would discuss it one on one on how, let's say, to approach one or another problem. How to fix one or another mistake.*"

E1 mentions another methodology for encouraging knowledge creation: kaizen process. „*Yes, definitely yes. Not only we provide tools, but also, we have Kaizen process in our organization, so if*

you see something which can be improved, the process or anything else, you can add your perspective officially – register your idea, get assisted from the experts on the field, collaborate with other teams and afterwards create documentation – <u>knowledge</u> (auth. remark) – about the improvement. Best part is that you not only improve process or create new actual to organization knowledge, but also get monetary reward for that.

To sum up, organization has signs of learning organization and have a lot of right qualities for coping with learning mechanisms, adapting learning, and creating sustainable culture to maintain people motivation, their attendance and feeling that you have team behind who will help you in problematic situation. Learning also helps to create new knowledge, because practices of learning influences new Knowledge creation in organization.

4.2. Knowledge sharing methods in organization

When talking about knowledge sharing, respondents shared methods of knowledge sharing in organization.

<u>E1: knowledge management system called Confluence to store work instructions, documents and to share documentation with work colleagues. Tool is not known for every employee in organization so its usage is limited.</u>

"of course, we have a knowledge management system. Confluence, where everyone can go and document the processes, work instruction, documents and share it with the team or other members of organizational community. Tool is relatively new so we did not manage to include all colleagues to use it, but in the future tool will be promoted organization wide."

<u>E2: Confluence is improved system for knowledge sharing but lacks structure.</u>

" I am happy that now we have confluence instead of other wikis that we had, it is maintained and highly structured, but it is not developed yet and not all the know how is stored there now. But we need structure in organization that could help us. Confluence helped share lessons learned process, before that it was difficult to find information – I know that we have loads of information about projects managing, functional experiences, but we gain mostly from the divisions that we are working on and not outside our boxes. However, there are a lot of info in confluence, it is difficult to distinguish which one is relevant. Also, for Confluence I think there is a problem that not all in organization know about its existence so I think that tool should be applicable to everyone, also advertised so people would know where to find the information that is being transferred. ".

<u>E2: knowledge sharing between departments and internal trainings with digitalized training programs.</u>

"In Girteka it is also possible to share knowledge between different divisions, about processes or practices in organization, in our department we have KISS sessions when we, for instance, ask people from other divisions to come and share experience (auth. Remark: tacit); also (colleagues

name) came after implementing huge project, and shared lessons learned about his project implementing with our division– it was presented in ppt and stored in SharePoint that is accessible to everyone. I cannot speak about all divisions that they would have such knowledge practices, however the word spread, and departments are already copycatting our practice. (…) People are sharing their knowledge by becoming trainers – new processes or programs that starts in organization and these trainings are not one time thing- they are continuous and some of them with their program goes to Girteka Learn (auth.remark: Software for learning) as digitalized training program, also with a requirements to grant work instructions about whole package of trainings. We have such trainings for process creation, for using CRM, for using Confluence, getting started to use SAP and off course, LEAN methodology. The best part is that all the training material is available to everyone in written format or in Girteka Learn as trainings. „

E3: Sharing knowledge via project management tool and live interactions.

"*For reporting, we were using tool stored in SharePoint: it was standardized system with reporting with monthly status and as you can see it was quite easy to use but not easy to report. Reporting was divided in two star and three-star projects. So, if you are from C level management, you can see the full portfolio of projects with high level descriptions on all projects; also, in detailed form... I put here information for project managers, too. Governance info, how project must be conducted in our organization, process of changing milestones, standardized status reports and templates for needed files for projects to be filled, also training material from internal and external sources. However, I think that in organization, well, at least, projects, info is shared via reporting and live interactions, because when someone acquire information or knowledge from me, they come to me; when they want to tell something for management, they fill in the report about their project.*"

Sharing practice in organization depends on different divisions, but in general, such technologies as knowledge management system and project management system is used, also, there are internal training programs that provides learning programs for employees and trains how to use technologies in organization.

All the respondents indicated what promotes knowledge sharing, how colleagues are sharing knowledge, the purpose of knowledge sharing, and the lacking elements in knowledge sharing process. In a table 10 given below there are answers to the questions regarding knowledge sharing and storing problematic.

Table 8. *Questions and answers on sharing knowledge in organization*

Question	E1	E2	E3
Promotion to share know-how	Knowledge management system	Knowledge management system.	Project management tool.
Colleagues are sharing and searching for knowledge by their methods	Organizational memory Colleagues and getting the answers physically contacting	Organizational memory Physical documents (printed out forms, etc.) Colleagues and getting the answers physically contacting All the needed information is in private folder.	Colleagues and getting the answers physically contacting
the purpose of knowledge sharing in organizational memory	To facilitate knowledge sharing with another team members This will help in the future when the team must perform similar tasks repeatedly It is relevant for newcomers.	To facilitate knowledge sharing with another team members This will help in the future when the team must perform similar tasks repeatedly It is relevant for newcomers.	To facilitate knowledge sharing with another team members This will help in the future when the team must perform similar tasks repeatedly
Important components of the knowledge sharing process in the company that are still lacking.	KMS Newly developed tool (2 years old) Not all information is in place Process for spreading issue is still not fully developed.	KMS Lack of dissemination Lack of structure Lack of branding	As from project management knowledge, *only positive outcomes.* *Plans to put all knowledge from project management practice to confluence* *As an improvement.*

Source: composed by the author

Analyzing data from Table 8 broader understanding was found on following topics:

<u>About promoting know-how share and the purpose of storing it in knowledge management system.</u>

E2 responded that a lot of colleagues are still searching/sharing knowledge via physical documents or in private folders. *"I've seen it for myself – colleague opened the drawer, took out a lot of sheets of paper and started reading work instruction on how to deliver a procedure. (…) Once I was conducting LEAN audit and colleague had a nicely done sheet in their computer, where the information about how to do Lean methodology was pinned out. I asked: Why wouldn't you store it somewhere, for instance, in Confluence, so everybody could see? And I got an answer that it took a lot of time to create such instruction, it is their property, why it should be shared?"*. It seem from the answers that was given that not a lot of people are enrolled in knowledge sharing culture.

<u>The purpose of knowledge sharing in organizational memory.</u>

E1 and E2 answers showed the same results, that it is important for other senior colleagues as well as newcomers, however, E2 shared insights *"To make all processes in sync, they have to be documented and stored so everyone would gather information on tasks to be completed the same. However, not all processes in Girteka are done by this scheme"*.

<u>Important components of the knowledge sharing process in the company that are still lacking.</u>

E1 mostly emphasized system deployment, that is still lacking processes to this day: *"System is new, and we create a lot of new knowledge, a lot of new documentation. However, we are not sharing or correctly informing colleagues that we did that. Documenting knowledge is not the issue, but the process. How we share don't raise awareness that this knowledge is somewhere and colleagues that are willing to get it, cannot find it"*

E2 sees the problem in communicating and disseminating about newly created knowledge management tool.

E2 mentions that the process of sharing knowledge, in her mind, is also not fully developed.

To sum up, it is seen that company has tools, but these systems are newly introduced tools, so it is still a lot of possibilities for improvements and welcoming more employees to use tools for knowledge sharing:

- Knowledge management system for sharing knowledge.
- Project management system that grants possibility to share project knowledge, but just between project managers.
- SharePoint for knowledge sharing, that does not fully comply with original knowledge management system.

Respondents also implied learning that helps to broaden possible directories for knowledge sharing. Company not only relies on explicit knowledge, but also:

- Organizes workshop sessions.
- Share internal knowledge by presenting lessons-learned,

- Onboards internal trainers to transfer organizational knowledge to the employees with a complex scheme of knowledge sharing: both documented and presented oral.

However, some employees are not willing share their know-how with other colleagues and it could lead to a loss of important knowledge in the future.

4.3. Knowledge management technologies to store knowledge in organization

When talking about technologies, respondents not only mentioned situation that is today, but also future perspectives of investments in knowledge management processes. Technical solutions that were mentioned by E1 and E2 includes: Knowledge management system, e-Learning platform, Asaichi (that is soon to be digitalized), whereas E3 mentioned Confluence, SharePoint and PMS tool. In the Table 9 the results of technologies for knowledge storing are summed up from interviews.

Table 9. *Technologies for knowledge storing in organization*

System	Summary of the system
Knowledge management tool	Advanced newly introduced system for documented knowledge. Will be fully developed in 2022.
E-Learning platform	Relatively old system for knowledge storing in interactive format. Will be improved in 2022.
Asaichi	System for keeping up with daily/weekly results, identifying and capturing knowledge. Still not digitalized but will be in 2022.
Project management system	System for project knowledge and status report tracking. Full version of the system will be functioning in 2022.
SharePoint	Tool for storing Microsoft documents. Difficult to find information, used not by its purpose.

Source: composed by the author

By broadening the information given in Table 9, all respondents commented on mentioned systems.

E1 reflects on knowledge management system and e-Learning platform from knowledge perspective:

"*We have two systems my I can think of. We have knowledge management system where we are keeping documented knowledge and work instructions, processes, and procedures. As well, we have a learning management system where a part of our know-how is kept. - the same knowledge but in different format. It can be in video format in written format as well. We are not only providing the knowledge to the employees, but as well test them how good they understood the material. In Girteka Learn (auth. remark: Learning Management system) we test not only results from the system itself, but most of the time we merge two of those systems and evaluate how people got acquainted with info from Knowledge management system and Learning management system combined.*" To sum up, tools used for storing knowledge are not fully developed and needs improvements.

E2 reflects on knowledge management system and e-Learning platform from knowledge perspective:

"*Learning management system – yes, we have system for learning, but it is overcrowded and difficult to use. IT has a lot of specifics, metrics, but there are nuances that are not user friendly and does not meet our expectations*".

E3 reflects on project management system and SharePoint for knowledge management in projects:

"*This SharePoint tool was not enough so we now bought real project management program and implementing it with pilot group of PM. We are still onboarding project managers, but you can already see all the project managers for strategic projects now. In the main page – high level info about owner, stakeholder, Gant diagram, also start and finish of the project. You can filter projects and find the one you are looking for. When you open the project, you then see detailed info, and as for you the most important part is documentation and knowledge management, I will show you how it will be conducted with this tool. So here you can see a dropdown for additional info: risks documented; assumptions; issues; project KPI; lessons learned; dependency; action items. Reporting can be as frequent as you like – in our company it is so important to do reporting, so we gave project managers ability to do that. (…) We have a lot of project managers, some of them are not professionals so first thing that we must do is to train them. But sponsors will be onboarded as soon as possible. For team members, at this time they will not have ability to log in, but we have plan to ingrate them as well. There is a possibility to buy other tool that syncs with this PMS tool for teams.*"

E1, E2 reflects on future perspective in knowledge management technologies:

All the respondents mentioned that there a lot of plans on developing new ideas on how to improve current technologies for managing knowledge. For instance, Confluence is ongoing project and will continue to be built till the end of the next year (E1), whereas Learning Management system is planned to be improved. "*So yes, we bought some additional tools to improve learning, licenses to provide learning. We already have the strategic plan that we want to implement in learning process: mainly it is gamification. So, to motivate people to learn by gamified solutions. Or ranking best top*

performers. Microlearning, providing learning in small and short e-learning courses, so people could learn during the breaks. We are also thinking about new LMS tool that could be implemented in mobile app and people could learn when going home or business trips ". Asaichi method that was also mentioned by E1 and E2 will be digitalized. As E2 is the representative of LEAN in organization, he/she shared insights: *"Now, for Asaichi, we do not have KPI tree – but we are planning to digitalize Asaichi system that would gather all of the KPI and put in one metrics"*.

To sum up, technologies that are used in a company complies with achieving knowledge management objective in organization. It helps to deliberately store codified information, track on important problematic areas that occur in a company; also, there is a future perspective for developing tools into more advantageous and targeted to ease the usage of the tools. In a company other technology can be found that helps employees communicate with one another, store knowledge.

4.4. Learning to create new knowledge in project implementation

Project managers reflected on combined knowledge management mechanisms that prevailed in a project context. Every question that was discussed led respondents to *critically reflect on their knowledge being created* emphasizing today's situation, in their current projects. The answers from each respondent will be given as indicators of absence/presence of mentioned variables; for the types that were created during every stage of project: initiation, planning, execution, monitoring & controlling and closing will be provided in tables as the questionnaire was conducted, giving the deeper analysis on this part of the gathered data.

As discussing problematic of knowledge creation, answers between respondents in some cases were similar, but depending on the importance on their project in a company, in some cases were different from each other. Problems are indicated in tables 10-12 and broaden with explanations from respondents below.

Table 10. *Absence of rules for creating knowledge in projects*

Problem	Key points
Absence of rules for creating knowledge.	No public repository for knowledge creation
	No collective knowledge in one place
	Knowledge is not created in one format

Source: composed by the author

With reference to Table 10:

P1 reflected that knowledge has to be created publicly: "*Knowledge must be created in public repository, at least for their teams. Because a lot of people likes to store knowledge just for themselves, while thinking that local file makes them cool and adds additional value to their job done. It sometimes looks like that with no sharing practice you become exceptional and not irreplaceable for the company, so that leads people not to share knowledge. But projects are made together, your documentation cannot be project finish, you must collaborate to get project going. It is one of the biggest problems: not sharing knowledge or limitation of transferring.*"

P4 mentioned the need for collective knowledge, but also added, that not only in projects collected knowledge must be shared; for projects it is also important gain knowledge about processes that are present in organization. "*When new project is initiated, the knowledge of project phases is not documented. That knowledge is stored in people's minds but there is nothing in our official memory. You come to project and understand that you must gather much more information that you thought about processes that has to be implanted. Sometimes knowledge that you acquire in a project, if it is a technical knowledge, must come from organization – about processes that already runs in a company. However, in practice sometimes this info is missing. It also can be, that processes are not functioning even though they are presented in some of the memories that we have. Some processes are not enforced and maybe they are too old, full of ineffective criteria and people does not renew it or does not even use it. Or maybe it is not even mandatory.*"

P4 mentioned incorrect documenting during the project scope: "*Also before there were no tools to get involved and give notice about incorrect documentations, next thing is that people are always rushing to fill in documentation in projects. There is a push to deliver the best outcomes from the projects as soon as possible and documentation put somewhere to background – to the future, but the time is never right at this point and documentation wouldn't even occur. This problem occurs when team effort is not there. So, it depends on team efforts from the beginning, though culture does not encourage but it has to be team initiative.*"

In a Table 11 summary of communication between organization and other teams are provided.

Table 11. *Lack of communication for creating knowledge in projects*

Problem	Key points
Lack of communication	Difficult to create knowledge when improving old processes in organization. Difficulties collaborating with other project teams.

Source: composed by the author

P5 mentioned the importance of knowledge from functional departments for the projects: "*There was no documentation done before. If project aim is to change some process, renew it, it is hard to find the right info. There is no knowledge captured and stored somewhere. People learns differently, they interpret the job done differently, and when you want to standardize, problems arise. And especially when the group of Interested party are bigger. Something must change – there must be information on how the job is done, so when standardization projects come in hand it would be clear what things lack specificity. Also, sometimes instructions are stored somewhere, we do our work with standardization and then one day, apparently, instruction appears out of nowhere. It was written and done in the old org. memory, but we did not know about it. So maybe it is time to raise awareness of current knowledge and Call to Action to document job instructions more frequently – as a rule.*"

P2 said IT department has a lot of qualities when working with different projects at once and urges to collaborate with other IT project managers because of homogeneity of projects preserved in IT department*: "Main problem is communication between different teams. For instance, in one project, some people create knowledge about one subject, they make statements but does not share with other teams. When talking about managing knowledge, there is no linear process and if something is being done, we are looking at processes, but we do not have consensus what to do with different information regarded to different projects. It is very different between one unit and another. It happens, in my point of view, because we did not grow to such qualities. Yes, there are intentions to change, and there is an attitude to that, but now we need plan and implementation on the changes regarding knowledge sharing process".*

In Table 12 the problem of knowledge management system absence in some projects is given.

Table 12. *No tool provided for creating knowledge in projects*

Problem	Key points
No tool provided for knowledge creation	Not all project teams are able to reach advanced tools in organization. Using old technologies to create knowledge.

Source: composed by the author

P3 shared experience of not having knowledge management tool to capture knowledge and using old technologies: *Confluence should be for everyone, but as far as I'm concerned, it's not 100% all set up. Well, so in my case it's all excels and SharePoint. There are a lot of tools and in my case, they are not aligning together".*

To sum up, main problems regarding knowledge creation are related to absence of rules from organization to conventionally create knowledge in organization, lack of communication between

teams and organization, and that not everyone is permitted to use the same tools that organization has established.

Learning in project implementation

For the knowledge creating, learning from other project managers, reading literature, going to external/internal trainings were mentioned:

P1 and P2: help from other project managers and creating knowledge to others.

P1: "*For me as a PM, that are willing to gather expertise, other project managers help. Project managers can see others activity, how they manage risks, their presentations and stuff. It is quite open and helps to acquire for my individual knowledge sharing, I create knowledge that is shared with others, too. "*

P2: "*I, for instance, acquire knowledge from other PM and share mine with them – we have colleagues with different experiences, tower leads and other project managers, so in general, we discuss knowledge related to us in collaborated meetings while discussing about daily tasks. Sometimes colleagues invite other professionals from outside, and they for instance grants best practices on agile, they transfer their knowledge. In general, you can learn a lot from project documents, their information in confluence, so if you are willing to investigate, you can. I went to look for experience in other project managers spaces, but you must think about it and come up with idea and look for information yourself, the knowledge created from myself is available for others"*

P2: individual trainings – no knowledge created.

"*We have ITIL training – external trainings that are being proposed for project managers; and we have time to develop learning. I've been in individual trainings – had to find them but got not only time to participate during work hours, but also monetary support from company. I did not have to pay for it. Also, we have internal trainings for PM. Because we have a lot of new project managers in business so internal trainings help them to be prepared. However, we do not document it in any way so new knowledge is not created."*

P3: through meeting other colleagues and finding their information in SharePoint.

"*I gain knowledge through colleagues, through meetings, through the intranet, because there is a lot of information about the organization's activities, and of course, in my case, SharePoint. However, in my case I found that you need to go the extra mile to get help. I mean, there is no checklist that tells you what you must do to make the project a success. There is no standard, but you can obviously find someone and get the answers you need from them. Maybe somebody has written down the standards, but these things are not clearly and easily available to anybody. You need to start doing it, then someone might come and contact you and tell you. "*

P4: external sources and individual experiences and creating knowledge to others.

"When I have the chance to document my knowledge, I share it with others. The acquisition of knowledge itself is again a variety of sources - external, such as online resources, various books, conferences, the same experience. I have seen a lot of things, I have seen what works, when there is an artificial change that comes from the outside that is artificially diluted, that does not take hold in the name of being diluted, and then it ends up being naturally rejected. It is just common sense to activate and select only the knowledge that is needed, and only the knowledge that is applicable in the company, and to share it at organizational or project level. Do only what can be done and optimize what is not needed. This allows you to focus on the key things needed in the project and share this valuable knowledge with others."

P5: irregular situations from past experiences – no knowledge created.

"I learn with every project where non-standard situations occur. Not only project but even tasks of projects give insights. A lot of experience comes from unfortunate experience, and then you reflect why this happened. Also, positive outcomes give experience. You can also reflect and adapt good practice for the future. I gain knowledge as myself not only from projects, but from outside sources. In projects that are complex I gather info where I'm still lacking knowledge, so I try not to get behind, and when we decide on some decisions in project, but do not feel strong in a field, I investigate literature We do not have lessons learned in organization for past mistakes to be captured, so no knowledge is created from such learning."

P5: trainings provided from company that will create new knowledge.

"Most of the time I do not have time for learning because of work, but now I have an agreement with my direct manager – this Friday and Thursday will be dedicated to learning, and next Thursday I'm not even doing my work tasks. I am going to learn things that are relevant to my new project – design thinking, Project management trainings that more linked to change management, excel trainings, UX and UI design which will also be useful for the project. Well, I cannot think of more, but I guess that is it for now. I am sure that I will share my created knowledge with colleagues after the courses, maybe in oral presentation or during project phases where this knowledge will be applicable."

To sum up the results, respondents learn from variety of sources. Company intentions for creating internal source of trainings and time for learning is seen in most of responses, it also helps project managers to create new knowledge and share it with team members, or in some cases – with other colleagues from organization. Sharing of practices and the experience from previous projects or its documentation was indicated in the results as a source of learning.

4.5.   Knowledge sharing methods in project implementation

When talking about knowledge and sharing, project managers spoke from their individual and team experience. For knowledge sharing in teams, mostly mentioned methods are putting it to knowledge management system and during the meetings. Results of shared knowledge during all phases of projects with answers are represented in Tables 13-17 given below.

Table 13. *Created and shared knowledge in initiation phase*

Initiation: Created knowledge + PM number	Method	Stored/Reused
Dependency, risk, procurement plan (P1, P4)	PMS	Y/N ; Y/Y
Workshops (P1, P2, P3, P4, P5)	Teams/minutes in confluence	Y/Y
Conference calls, meetings (P1, P2, P3, P4, P5)	Teams	Y/N
Yellow pages (P1, P4, P2, P5)	Confluence	Y/Y
Project charter (P1, P2, P4)	PMS	Y/Y
Budget plans (P1, P4)	PMS	Y/N ; Y/Y
Numbers for business (P2)	Confluence	
Divided tasks between it teams (P2)	Confluence	Y/Y
Emails (P5, P3, P2)	MS teams	N/N
Checklists (P3)	N/A	N/N
Slides (P3)	SharePoint	Y/N
Documented process (P3)	SharePoint	Y/N
Gemba analysis (P5)	Excel template	Y/N
Roadmap (P5	Confluence	Y/N

Source: composed by the author

Table 14. *Created and shared knowledge in planning phase*

Planning: Created knowledge + PM number	Method	Stored/Reused
Workshops (P5)	Teams	N/N
Planning meetings (P1, P2, P3, P4, P5)	Teams	Y/N
Pilot version of a project presentation (P5)	Teams/in person	N/N
Roadmap (P5, P3)	Confluence/SharePoint	Y/N; N/N
Process for renewing process (P2)	Confluence	Y/Y
Workshops for solution design (P2)	Confluence	Y/Y
Demands for 3rd parties (P2)	Confluence	Y/N
Created process and 150 docs (P1)	Confluence	Y/Y
Documentation on changes (P1)	Confluence	Y/N
Emails (P5, P3)	Outlook	N/N
Business Case (P5)	SharePoint	Y/N

Source: composed by the author

Table 15. *Created and shared knowledge in execution phase*

Execution: + PM number	Method	Stored/Reused
Decision logs (P1)	Confluence	Y/Y
System execution descriptions (P1)	Confluence	Y/Y
Task descriptions (P1)	Jira/Confluence	Y/N
Change requests	Confluence/SharePoint	Y/N; N/N
Steering committee documents (P4)	PMS	Y/Y
Third party agreements, payments (P4)	PMS	Y/Y
Standups every day (P4)	Teams	Y/N
Decisions>Tasks>Documentation (P4)	Confluence	Y/Y
Presentations (P5, P3)	SharePoint	Y/N
Meetings (P5, P3)	Teams	N/N
Trainings (P5, P3)	Teams	N/N
Public communication (P3)	Intranet	Y/N
Meetings, notes and meeting minutes, task preservation (P2)	Teams/Confluence/Jira	Y/Y
Training learning material (P5)	Confluence/SharePoint	Y/Y

Source: composed by the author

Table 16. *Created and shared knowledge in monitoring and controlling phase*

Monitoring and control: + PM number	Method	Stored/Reused
Benefit tracker (P4)	PMS	Y/Y
Deep dive material for Managers (P4)	PMS	Y/Y
Observation meeting (P3)	Teams	N/N
Surveys (P3- newcomers, P5 - Changes)	Microsoft forms	N/N
New training programs material (P3)	PTT/SharePoint	Y/Y
Presentations (P5, P3)	PTT/SharePoint	Y/Y
Regular meetings (P5)	Teams	Y/N
Trainings, live consultations (P5)	Teams	N/N
Presentations (P5, P3)	Sharepoint	Y/N
Meetings (P5, P3, P2)	Teams	N/N; Y/Y
Trainings (P5, P3)	Teams	N/N
Confluence notes (P2)	Confluence	Y/N
Discussions (P2)	Teams/Confluence/Jira	Y/Y

Source: composed by author.

Table 17. *Created and shared knowledge in closing phase*

Closing: + PM number	Method	Stored/Reused
Lessons learned (P5)	PMS/Confluence	Y/Y
Email confirming project end(P3)	Outlook	Y/Y
Digitalized forms (P3)	Service Desk	N/N
Project evaluation (P2)	Confluence	Y/Y, for future pm
Instruction's package (P5)	PTT/SharePoint	Y/Y
Handover file (P5)	SharePoint	Y/Y

Source: composed by the author

Results from tables will be discussed and analyzed from all respondent's perspective.

P1: A lot of knowledge created in Confluence encouraging team members to use system as a main source of knowledge for sharing.

We have a rule – not in confluence, it is not in project. When document is in confluence, welcome, we have a document to use. Well, sometimes, in teams we share bigger files that are too big in capacity for confluence, but in general, if everyone cannot see it, it is not projected. Documenting knowledge in our project case meaning – delivering project results. So, for sharing knowledge, the distinction between public and in deliverables, helped".

P1: Relevant knowledge was mostly created in project initiation, planning a control by saving it in KMS.

"Everything was captured and stored in knowledge management system, even meetings. "

P1: Decision log that was composed only in execution phase.

"Every document is as decision log, but for additional we wanted to create it because of the knowledge from emails that was left behind. We did not have goal for documenting lessons from the project, however there are plans for milestones "

P2: Knowledge stored in knowledge management system, shared during leaders meeting.

"Inside our project team there are towers which has leads- they participate in weekly meetings. All of them have their projects and share their knowledge. However, I do not participate, but my manager always updates me with info from such meetings. And, we have in knowledge management system where all the documentation is stored.

P2: Knowledge mostly comes from meetings and direct interference with Confluence.

"If talking about my project specifically, we have meetings – periodical and non-periodical on demand, and we put effort to have all the tasks in confluence, document everything, making diagrams, analysis and reports. Well, also, most of our tasks are being documented in meeting minutes, so basically main channels for transferring knowledge are confluence and meetings."

P2: changing times in project management in IT department. For the next year projects the knowledge from current project will be a source of information for new projects.

What I've learned from the project that you must do it step by step, you must follow the guides of project management, especially if projects are strategic. We must determine what we see in projects for the next year – discuss it during meetings, so we are planning on workshop on a process how projects will be implemented next year. Before now project implementation was chaotic, but now after New Year, will be based on past project knowledge. We are looking for dependencies between projects, we are looking at the bigger picture and trying to find connections between projects that are new. Lessons learned is still lacking, but my project will be as a material for future projects that would be

implemented. This project will be used for future material for new projects to arise. In future projects confluence will be mandatory".

P3: the greatest part of knowledge during the initiation was explicit, when in planning a lot of meetings were conducted.

"Meetings, mostly, online and a few live. Expressed in writing - written systematization, but this one mostly for the team and focus group – managers. We did not do any retrospective on knowledge that was spoken, it was basically only meetings. However, during execution I had to conduct few trainings that was a main goal of a project. After that I created presentations, that was written and saved on SharePoint for everyone. Also, I built questionnaires to estimate the quality of trainings. Written was placed on intranet, our internal information system, Handouts on SharePoint; verbal: presentations to individual groups, Live training. All the material created was all new, so it will be able for future corrections. In monitoring phase most of the work done was by recreating and updating materials after the feedbacks, some of that material I took from SharePoint, documents from the past that I also renewed. For closing, the biggest job was to renew forms for requests, in cooperation with IT departments forms were prepared and now run in a company. "

P4*: knowledge from projects documented from the beginning.*

"In project scope it really depends on agreements with a team. If you and your team determine to document the knowledge, you document, and new members can onboard quickly. Problem occurs when new team members join the team, they must again gather info and spend a lot of time for hit the ground running. Sometimes it takes few months to gather info. However, if info is already captured and stored it becomes easier. And I experienced it in my projects. If documentation is gathered, new project members onboard much quicker and the newbies are able to add their insights and renews knowledge that is gathered"

P4: focus on workshops, yellow pages, project charter in the initiation, for planning conducting planning meetings that also later being captured in knowledge management system.

"My team experience is confluence; we document product and changes that are also linked to Jira tasks. Product status description > Documentation > and all the new functions happens. When change is implanted, we renew product documentation. We work with agile methodology. Confluence is main tool for specs, and Jira is just only for tracking, they align with each other."

P4: In the execution the greatest focus goes to third party agreements, steering committee documents for reporting to management; most knowledge is tacit.

"Sometimes notes from greater presentations were sent for all participants; however, most of the meetings were not tracked and described, these daily standups were for everyday activities and

even though we had vision, we worked with the principle of sprints, eliminating problems each day to create continuity; in some cases, there were minutes, but when the meetings were not a scope of team members but more broadly when other people from the organization were involved with their own tasks",

P4: in monitoring: deep diving with management to get into the problems in project, its illimitation etc. Document from deep dive is being renewed every quarter.

P4: in closing - no lessons learned captured, but team is seeing the demand for projects to promote such practice.

P5: Shared knowledge within meetings, documentation afterwards.

"Knowledge that we gather from people most of the time comes from meetings. It is a conversation with employees before project start, we talk, if possible, in real life, due to this we have conference calls – no messaging, most of the time. This is how we acquire. We share during meetings with team where we gather material for documentation. We write a document about for instance some update, sometimes prepare ppt, and present for those interested people about the update, also we share written material. If people have further questions, they can always come to us and we would do presentation again."

P5: in initiation Teams/live meetings, Excel files with information about meetings before initiation phase, Gemba forms for non-standard decisions for the future planning.

"I think that there was equal number of meetings and documented knowledge, but no meeting minutes were captured, however 80 percent of information was made available for everyone."

P5: in planning knowledge management system and PMS started being used, more documentation.

"Our page is fully up and running, and everyone can see it, also PMS tool called PPS is being used for project tracking and managing – a lot of knowledge was put there, in planning there was more documentation rather than meetings and talking, and most of information was shared only with other team members"

P5: in execution a lot of attention was paid for PMS and SharePoint for creating draft files of knowledge.

P5: Monitoring and control is visible only to team members and management as it is classified information.

"Pilot part of the project runs in a form of trainings for test group of people – training is later, in closing, transformed into work instructions and put in Confluence, also all the draft files from were reversed to Confluence files and published for everyone to see."

To sum up, project knowledge sharing and acquiring appears to be a quality that was not obtained in a past but steadily starts to be one of the main components for driving projects in

organization. It was indicated that shared knowledge in this case can vary in forms that is created, not only because of the team that is working with the project, or not (as it was predicted) of the status of the project, but also because of the stage in which project is now. The practice that is seen for knowledge sharing is different in all five projects, which leads to observation that organization still does not have standardized process for documenting project knowledge, as it is in functional part of company. On the one hand, organization provides tools for knowledge storage and support when needed to learn how to use tools, how to set up space for documentation etc. On the other hand, one project did not even used organizational memory and some of the team members from P5 team did not know how to use Confluence, which led to more frequent use of SharePoint, which, by other project managers was claimed as a tool not fully functional for project management documentation. Following part of the research will be for indicating gaps and ways how to improve organizational memory and knowledge management practice in general.

4.6. Knowledge management technologies to store knowledge in project implementation

In organization exclusion between tools are present, it is beneficial to analyze what tools for knowledge management are using each respondent.

P1: Confluence system (auth. rem. Knowledge management system) is main system which should be accompanied with JIRA.

"For knowledge capture and storing in every step confluence and teams. We used excel and MS office package, but I do not want to include it in project managing topic, because I do not support this as a good idea. And we are planning to implement Jira (auth. remark: project/task management software) from February. There is a need for project members to learn how to use it and as we have loads of members, it takes time. But if getting back to organizational memory, I would say, that it is vital for us, but as project scope is enormous, the system cannot be the only one in place, because confluence cannot render huge documents that is needed for project results and everything. But if other system would be in practice, it would help divide information: Confluence to have for know-how, but general project info and huge documents store somewhere else",

P1: Needed project management tool for teams, not only project managers.

„Project management department built a new tool for project management, it is implemented, but today only few of project managers have granted access. And it sends reports to management. But we need such info for all the members of the project. For creating results and analysis, I would say we are lacking mindset today. But maybe there are reasons why one or another tool is chosen."

P4: Using Jira and Confluence, MS Teams. Outlook, indicated need for document management system, criticized SharePoint for its inflexibility.

"We use Confluence - it is easy to access, it is easy to edit, it is easy to follow updates, it is easy to leave comments - those are the main things, and the main thing is not the System as it is, but more important is the content, what is being put there. I was offered to use SharePoint, too, but SharePoint is too 'heavy' for me, we still sometimes use it, especially when looking for general info. Also, MS teams, and off course, Outlook, Jira. In my eyes, tools that we have are enough for managing project knowledge – you just must use it. However, in the project level alone, you might need not only confluence, but also a document management system, both during the project and after the project, because such documents, as contracts, a project plan, a project business case - is not for confluence, it needs a place where you put them and when the project is over, you can forget about them, but there is still some info left. And if someone else wants to look up that info, they will. So, these things would be useful."

P2: Using Confluence, Jira, criticized excel.

"For organizational memory I see confluence. I really like the tool and am happy that we are using it; great that it syncs with Jira. With confluence at least information is seen for everyone. You can find; however, I do not share it intentionally. Also, a lot of people, unfortunately, works on excel. Even projects documented on excel. We need all of us change our perspective and go to confluence instead of excel. In excel even though these files are online in cloud system, they are shared just for a short period of time and it is not effective in a long run. You can find it via link, but you can easily lose it. But in confluence we have search, arranging and everything is in one place."

P3: Using Excel and SharePoint, indicated need for knowledge management system.

"For me, the knowledge management system is replaced by excel in projects, because I don't use confluence very much, and I still have one note for project tasks and execution, or excel, which is in SharePoint. The drawbacks of these systems are that I would like them to be more user friendly, because basically these are systems that are not designed for project management: you modify them to some extent according to your own needs, but it requires additional user input to use it according to your own plan. It would be much more logical to switch to a dedicated software instead of adapting excel to the logic required for the project. "

P5: Using Confluence, SharePoint, MS Teams.

"For sharing we use confluence, SharePoint, and Teams. Confluence is for end information, but work files are stored in SharePoint. We share those files, modify them. But when the end file is prepared, we try or at least plan to put it to confluence. "

To sum up, projects in organization has ability to use technologies for knowledge management. However, not all projects have ability to use knowledge management system and uses old technologies instead that is criticized by other project managers. It can come up as an obstacle when searching for

collective project knowledge in the future. Also, only project managers have possibility to log in to project management system, so team members have limited access to knowledge about projects.

4.7. Summary of results

After getting familiar with the answers from respondents it can be stated that knowledge management process in organization and in project implementation is satisfactory, though needs attention to be in line with organization practice and project implementation. It is now seen, that:

- In organization and project implementation for knowledge management similar technologies are used.
- Organization knowledge experts and project managers indicate knowledge management practice – knowledge is stored and shared among some organizational unit/some members of the team.
- Reflecting on E3 efforts to ease work of project managers as much, it could be also said, that organization supports project management activities. However, in some parts of the absence of organizational efforts towards some of project managers is seen.
- From the research it was also learned that organizational learning is a process that is still ongoing – both in organizational units and project implementing.

The interviews with knowledge management experts showed that knowledge management process is in presence, where learning support new knowledge creation, knowledge sharing is promoted by newly developed tools, workshop sessions, internal trainings. Technologies such as knowledge management tool, e-learning platform, project management tool, Asaichi system and SharePoint technology provide employees with opportunity to be involved in knowledge management process of creating, storing and sharing their knowledge. However, the systems and practices are not reachable to all the organization, and it reflects in the results given by project managers.

The results from conducted interviews with project managers showed that project managers are familiar with knowledge management in organization. From the answers collected, it is seen that knowledge management process vary depending on project which is being investigated. Some projects can use tools and practices found in organization; some are still using old technologies not knowing about possibility to improve the overall knowledge management process in their project.

To determine differences and similarities between knowledge management in organization and knowledge management in project implementation, answers on knowledge management from experts and project managers are given in table 18.

Table 18. *Summary of results about knowledge management process in organization and project implementation*

	Experts' answers about knowledge management in organization	Project managers answers about knowledge management in project implementation
Learning to create new knowledge.	Open forums and discussions, Systems that encourage communication, Weekly/monthly meetings, New knowledge capturing practices, Newly developed systems to store knowledge, Lean methodologies.	Absence of rules for creating knowledge, Lack of communication when there is need to create organizational/project knowledge, Tool not provided for everyone to create knowledge, Communication with other PM's, Individual trainings, Meetings, External sources and individual experience, Trainings provided from company.
Knowledge sharing methods.	Knowledge management system, Internal training programs, Knowledge sharing between departments, Project management tool, SharePoint to share documents, Workshop sessions, Knowledge not shared with other colleagues, Knowledge shared by communicating and later lost.	Knowledge management system, Leaders' meetings, Meeting sessions, MS Teams, Excel files, Project management system, SharePoint tool.
Knowledge management technologies to store knowledge.	Knowledge management tool, E-Learning platform, Asaichi, Project management system, SharePoint.	Knowledge management system, JIRA system, Project management system – needs to be reachable for project teams, SharePoint, MS Teams, Excel, Need for document management system.
Possible improvements.	To fully develop technologies that are present to this day, Include more employees in knowledge management process, Enroll more learning practices to motivate people participate in knowledge creation and sharing practices, To minimize number of systems to create and share knowledge in order not to lose knowledge.	To include more learning practice on how use systems according to rules, Include more project teams in systems that are present in organization, Encourage project teams to share knowledge within projects, Make project management system accessible to project teams.

Source: composed by the author

Differences of results received in groups of experts and project managers:

From the table 20 results show that for knowledge creation organization includes LEAN methods which are a great help when creating rules for work processes, also communication encouragement system which possibly leads to defined rules on how to create new knowledge. In project implementation, it was indicated that lack of rules and communication develops problems for knowledge creation.

When talking about knowledge sharing, some project managers indicated that they do not use knowledge management system, when in organization it is the main system for sharing knowledge. Organization promotes practice when knowledge is shared between different departments, when project managers did not indicate such method for sharing knowledge in their current process of knowledge share.

For technologies that are used in organization, Asaichi system was mentioned, but it was not determined in project implementation knowledge management processes.

Similarities of results received in groups of experts and project managers:

Knowledge creation is promoted by internal training programs, dedicated learning time, communication with other employees in organization and project implementation.

Knowledge sharing is done by using similar practices, which includes knowledge management system, project management system, SharePoint and meetings.

Tools for knowledge management are also similar – Knowledge management system, SharePoint, project management system.

Improvements:

For organization, the main problems were indicated in relation with still developing technologies. It can be concluded, that to improve knowledge management process in organization, technologies that are present to this day has to be fully developed, more employees in knowledge management process have to be included, more learning practices must be created to motivate people participate in knowledge creation and sharing practices, number of systems to create and share knowledge must be minimized in order not to lose knowledge.

As project managers concluded their knowledge management variables and knowledge sharing practices, they also shared their insights on how knowledge management process could be improved with a help of organization. They indicated: *more people included in KM processes*, *expanding project management tool scope to team members, making standardized process for knowledge creation, and sharing for projects.*

- <u>More people included in knowledge management process</u>:

P1 said: *"To include more and more people. People are not willing to learn use the tool, because it is new system and some people, from my experience, it just seems like, that thinks they can go on without it. "*

- <u>More teams included in knowledge management system:</u>

P1: *"not all the people are using Confluence, so problem occur when for instance we are driving project, and want to document, but cannot do it in confluence, because people does not know how to use it, how to read info. So maybe when gathering project team, we should organize trainings on confluence for them – maybe trainings would lower the usage of SharePoint. We need teammates correction and input.".* P3 also stated: *"To improve this situation, I think we need to include more projects in confluence ".*

- <u>Standardized process most of all project managers.</u>
- <u> Classification for documentation, that organization could provide the guidelines and rules.</u>

P2 said: *"How to strengthen knowledge management culture in projects? First thing comes to mind is that this Confluence space that we can access is a big win for our company because then people start sharing, they start use confluence because it's easier to use than other solutions. For strengthening I would say that we are in a good starting point right now, but with time let's hope that process of documenting will be alive, and colleagues will keep improving inputs in a system.*

- <u>Asaichi practices in project implementation.</u>

P2: *"I would love kaizen for confluence and project management, not only for business, to improve, improve, improve. IT could be a space with expertise sharing, like table with information that could be relevant for the future. Because for myself it is the same, when I see from other spaces, it's like I want it too, and you apply to your space as well, but then all spares differ and there is no process. I would improve system with lessons learned and periodical reports on projects to align knowledge from projects."*

- <u>Trainings how to prepare project documentation.</u>

 "Also, we are not sure when document is final and when we have to stop editing it… Every week we are talking about pilot team and the changes that occurred, long story short – gathering info. And that file that we compiling is going on for a month, and when the file will be ready? When it will be good to use? Well, it is just my thoughts, when do we stop editing and when we decide if this is final for the project and we give document to functional levels – organization.

To sum up, research showed that knowledge management processes have similarities and differences in organization and in project implementation. For project managers to improve their project knowledge creation, sharing and technology usage, organization must provide same opportunities for all project managers so it would be possible to share knowledge practice between different projects. Organization could standardize knowledge management process in project

implementation, recommend systems that are present in organization for all project managers, so the sharing and knowledge creation in projects would improve overall project management in organization.

5. CONCLUSIONS AND RECOMMENDATIONS

Theoretical framework reveals that knowledge management and learning are beneficial to organizations. By effectively employing these processes, organizations become more competitive and implement projects more efficiently. It is beneficial to strengthen the existing knowledge management components such as knowledge creation, knowledge sharing, knowledge storage, and learning processes at all stages of project implementation. It was found out that:

- Knowledge in organizations is a non-monetized asset that must be differentiated between explicit and tacit knowledge, organizational and individual knowledge. Furthermore, knowledge must be codified, stored in a knowledge management system, structured and managed for organizational and individual purposes. In projects, types of knowledge may also be either explicit or tacit, existing within or between projects. Meaning, project knowledge differentiation is also necessary, because explicit knowledge may be stored and maintained for the future use. When codified, it is easy to find, use and reuse for future purposes on both project and organizational levels.

- Knowledge management can be defined as the wealth of intellectual assets within an organization. It is understood as a process to identify, develop, store, share, use and reuse knowledge across an organization. When the knowledge management process is advanced by applying technology and tools, knowledge management systems can be implemented. It leads to new knowledge extraction techniques, more creative decision-making and knowledge sharing processes. During project implementation, knowledge management is important too. Innovative projects require the most knowledge, since their purpose is to replace old technologies/products with something new. Organizations often fail to manage knowledge once the project is over, meaning it cannot be used in the future.

- Knowledge management system in an organization is the main element needed for storing, sharing and reusing knowledge in the knowledge management process. It is a sum of individual and organizational knowledge assets that an organization uses when accomplishing tasks. Knowledge sharing in a project requires a knowledge management system as well, because project knowledge not only has to be created, but also be prepared for sharing. For creating and sharing project knowledge, organizations must put effort and provide a knowledge management system.

- Learning in knowledge management is a process that encourages people to grow, to share knowledge, learn from each other or previously captured mistakes. Organizational learning is an organization's capacity to process – to create, share and integrate – knowledge. When it is used in practice, not only overall behavior in organization changes, but also the performance

of an organization is improved. During project implementation, knowledge management and learning improve not only the project that is being implemented, but also the organization, as the collected knowledge can be shared in the future. Meaning, some knowledge is directed at project activities, while the rest supports organizational need for having knowledge of project successes, failures, and other information. Learning in project implementation is different teams learning from past experiences of others.

During the research, 8 interviews were conducted, the recordings of which were analyzed. First, interviewees were divided into two sections: knowledge experts and project managers. Each participant presented answers from their point of view, providing a broader understanding of a company investing in knowledge management and learning processes. Project managers come from the same company but manage different projects in different activities, coordinate projects that vary in strategic importance. The research results show the cohesion within knowledge management in organization and in project implementation.

- Learning to create new knowledge in an organization helps create new knowledge, because practices of learning influences new knowledge creation in an organization. Learning provides useful qualities for coping with learning mechanisms, adapting learning, and creating sustainable culture to maintain people's motivation, their attendance and trust in fellow team members. In project implementation, the company's intentions for expanding internal training and time for learning are hinted on in most responses. It helps project managers create new knowledge and share it with team members, or other colleagues from the organization. However, in project implementation, problems when creating new knowledge occur, which are mostly linked to lack of communication, ability to use systems for knowledge creation, lack of rules on how it should be used.

- Knowledge sharing methods in the organization were composed of technologies such as knowledge management system and project management system SharePoint, and internal training programs that provide learning opportunities for employees and trainings on how to use technologies in the organization, workshop sessions. Meaning, the organization promotes explicit and tacit knowledge sharing. It was also found that not all employees in the organizations are willing to share their knowledge. In project implementation, knowledge sharing is one of the main components. Shared knowledge in project implementation varies in form, depending on the team that is working with the project, and the project implementation stage. It was found, during project implementation the organization still does not have a standardized process for documenting project knowledge, as it is in the functional part of the company. The organization provides tools for knowledge storage and support when needed to

learn how to use tools. However, not all projects are using the same technologies to share knowledge within projects and organizations.

- Knowledge management technologies in the organization help achieve knowledge management objectives. It allows to store codified information, track the problematic areas within the company. Furthermore, there are perspectives for developing tools in the future, making them easier to use. In this company other technologies help employees communicate with one another, store and create knowledge. In project implementation, project teams and managers have the ability to use technologies for knowledge management. However, not all projects are included into the knowledge management system. Meaning, some still use old technologies instead, which are criticized by project managers. It is difficult to share knowledge when different systems are used in different projects.

- Summarizing the results, knowledge management processes have similarities and differences the organization and in project implementation. For project managers to improve their project knowledge creation, sharing and technology usage, organizations must provide the same opportunities for all project managers, making it possible to share knowledge practice between different projects. Organization could standardize the knowledge management process in project implementation, recommend the same available systems for all project managers, so sharing and knowledge creation in projects could improve the overall project management in organization.

Recommendations

The research broadens the understanding of knowledge management in organizations. Itis aimed for project managers and organizations to see the importance of consistent knowledge management processes that are important for organizations and project implementation. The analysis shows that project knowledge is useful at all organizational levels, and organizational knowledge is important for project implementation. Thus, it leads to the recommendation that the knowledge management process must be aligned in all units of organization, providing the same technologies, possibilities for all employees to create, share and store their knowledge in organization and in project implementation. It is also recommended for the organization and project managers to ally when coming up with project implementation guidelines and detecting what knowledge is important in each phase of project implementation to create a better environment for learning from projects mistakes and successes. Based on the research findings, it is recommended for the organizations to include knowledge management processes in the beginning of the project implementation, to give more attention to all phases of project implementation, so knowledge would not be lost, and mistakes from projects would not repeat in the future.

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APPENDICES

Table 19. *Example of interview on project implementation*

Introduction   *Today I invited you to talk about my master thesis and mostly what I need from you is to talk about knowledge management and learning in project implementation.*   *At first, we will discuss about knowledge management in organization and in project implementation in general, and second, we will focus on knowledge that was created in your project during all implementation phases.*
1. What are the main problems regarding managing knowledge in projects? Why do you think they happen?
On organization scale there is not a lot of motivation to do it. Practically processes are not functioning even though most of them are prepared graphically. Some processes are not enforced and maybe they are too old, full of ineffective criteria and people does not renew it or does not even use it. Or maybe it is not even mandatory. Also before there were no tools to get involved and give notice about incorrect documentations, next thing is that people are always rushing to fill in documentation in projects. There is rush to deliver and documentation goes to back round to future, but the time is never right at this point and documentation would not occur. So definitely it depends on team efforts from the beginning, though culture does not encourage but it has to be team initiative.
2. What are the main problems regarding managing knowledge in projects? Why do you think they happen?
When new project is initiating, the knowledge of project phase is not documented. That knowledge is stored in people's minds but there is nothing in our official memory. You come to project and understand that you must gather much more information that you thought about processes that has to be implanted.   *In project scope it really depends on agreements. If you and your team determine to document then yes, you document, and new team onboarded can onboard quickly. Problem occurs when new team members join the team, they must again gather info and spend a lot of time for hit the ground running. Sometimes it takes few months to gather info. However, if info is already captured and stored it becomes easier. And I experienced it in my projects.*
3. Can you please describe how your team usually collects and shares information?
My team experience is confluence, we document product and changes that are also linked to jira tasks. We work by logic: Product status > and all the new functions that happens. When change is implanted, we renew product documentation. We work with agile methodology. Confluence is main tool for specs, and Jira is just only for tracking, they are allying with each other.
4. Will you say that the organization is learning through the projects that are made?

Organization is learning from projects. I do not know a lot of other projects, but some strategic projects document their knowledge. And it again depends on learning processes in a team. When we started documenting we do not have problems that had before. We do change current knowledge and eventually everyone understands and absorbs that when the volume is high, the level of detail is high. Main thing is that there are many different nuances, once you make a change, you have to go back to it, which means that if you don't have the documentation, you will have to go back to explaining, interviewing people, not understanding how the processes work and trying to find out every time.

How difficult it is sometimes to make changes in old systems that have not been documented from the beginning and now you don't even know how to improve the situation. This practice is used as a bad practice in the implementation of new projects in workshops, so I think this change can stand as a point where organization starts to learn from its projects - it is effective to document relevant knowledge from the beginning of the project.

5. Do you use any knowledge management software? What are the main deficiencies that you can identify? How would you improve it?

We use Confluence, we are not completely satisfied with the editing, it is sometimes difficult to edit fully as you want, but it is not critical, what is there now can be used. I can't really think of any disadvantages. Again, maybe that is the possibility, to limit access to information. But it is easy to access, it is easy to edit, it is easy to follow updates, it is easy to leave comments - those are the main things, and the main thing is not the System as it is, but more important is the content, what is being put there.

6. How do you usually acquire and share knowledge?

When I have the chance, I share my knowledge with others. The acquisition of knowledge itself is, again, a variety of sources - external, such as resources on the internet, various books, conferences, experience that I get from working. I have seen a lot of things, I have seen what works when there is an artificial change that comes from the outside that is artificially diluted, that does not take hold in the name of being diluted, and then they end up being naturally rejected. It is just common sense to select only the knowledge that is needed, and only the knowledge that is applicable in the company, and to share it at organizational or project level. Do only what can be done and optimize what is not needed. This allows you to focus on the key things needed in the project activities and create knowledge, experience about it in your own head, later share with others.

7. Is there some help from organization that would facilitate knowledge management in project implementation?

Not that organizational culture has helped to identify the problem, but I have seen for myself that there is confluence in the company. When I joined the organization and the project, I knew that I

would need to do documentation and I knew what my preferred tool was. Then I was offered SharePoint, but SharePoint is not as lean system as confluence, it's heavier on the editing aspect, on the sharing. When I got an approval to use confluence and I was positive that I was able to document confluence. With confluence using I got help - both in terms of finding the space and involving external partners - I got help with those things. In the beginning it wasn't that somebody said, here's this convenient thing with us. It was my initiative. The templates that were needed in the future came from project management activities.

8. How to strengthen the knowledge management culture in the company and what can be done at project implementation level?

Processes and know-how are documented in the company, and this information is available to as many people as possible. It may not be relevant to some people, but if it can be made open for people to read and see, then perhaps also generates new ideas, so that someone from the field, logged in, and having a look, can suggest something. Suggestions from me to knowledge management for both functional and project teams would be usability of new systems, also improvements in interface usability, etc. Clear structure, whether time investment is needed, etc. I still find it difficult to find information, although the Knowledge Management System is improving. Again, it is possible to look through the processes already, cross references that we are going from high level processes to more detailed ones, then we can look at procedures and instructions. Let's hope that's where we're heading because it looks promising.

Projects at the project level alone need not only confluence, but also a document management system, during the project and to keep after the project such documents as contracts, project plan, project business case, some place where you help and after the project is finished you forget but there is info left. And if someone else wants to look up that info, they can. So, these things would be useful. In my eyes the tools are there at project level.

Initiate phase – what knowledge was knowledge created? How was knowledge created? Was it was shared within organization? How was it shared within teams? Was it saved in knowledge management system?

For the beginning of the project, you have to think of documentation that will be gathered, because new project members onboard much quicker and the newbies are able to add their insights and renews knowledge that is gathered. We found that a lot of impact for initiation has yellow pages that we created and stored in confluence. However, teams changed, and you must bear in mind that such information must be renewed during all phases of the project. In initiation we had default documents that was filled in – dependencies, risks, procurement plans, budget, project charter. Well as it is given with templates in project management system, it is easy to create such knowledge and store

it. Also, we had workshops and was writing out minutes of important information, butting it to confluence.
Plan phase – what knowledge was knowledge created? How was knowledge created? Was it was shared within organization? How was it shared within teams? Was it saved in knowledge management system?
Most of the meetings were in the planning phase - daily work, everybody together, everyday standup and exchange of ideas, what are the blockers, who is working on what, how to deal with it, and in the execution phase. *The daily meetings were about day-to-day problems, here and now, we have a vision, but every week we do weekly sessions, we do tasks, which are then documented in confluence, and in the end those problems grow into product updates.*
Execute phase – what knowledge was knowledge created? How was knowledge created? Was it was shared within organization? How was it shared within teams? Was it saved in knowledge management system?
In this phase, sometimes notes from greater presentations were sent for all participants; however, most of the meetings were not tracked and described, these daily standups were for everyday activities and even though we had vision, we worked with the principle of sprints, eliminating problems each day to create continuity; in some cases, there were minutes, but when the meetings were not a scope of team members but more broadly when other people from the organization were involved with their own tasks. Main documents that I could think of were steering committee documents, that were given by project management department and found in project management system, the ones that I filled was stored there for later use. Also, same goes to third party agreements. In confluence we worked on a principle – decisions>tasks>documentation. Every decision that we made in execution brought us new documentation, or the renewal of the old one.
Monitoring phase – what knowledge was knowledge created? How was knowledge created? Was it was shared within organization? How was it shared within teams? Was it saved in knowledge management system?
deep diving with management to get into the problems in project, its illimitation etc. Document from deep dive is being renewed every quarter. We saved it project management system, will be reusing this knowledge for other projects. Deep diving template was given from project management department. Also, benefit tracker. It is a document also saved and granted from project management system – to track changes of the project and see the current benefits that the project is bringing.

Closing phase – what knowledge was knowledge created? How was knowledge created? Was it was shared within organization? How was it shared within teams? Was it saved in knowledge management system?
It is a pity, but no lessons learned were captured. We have the legacy of our confluence space where everyone can go and see how project was conducted, however, team is seeing the demand for projects to promote such practice.

Source: Composed by the author

Table 20. *Questionnaire about knowledge management in organization*

Knowledge management
1.Does organization encourages documenting new skills and expertise? E.G. Do employees tend to accumulate their know-how in organizational memory?
2. What is method that organization promotes to collect, and share know-how?
3. Where most of the time knowledge is searched when there is a need to find answer how to do task? Could be more than one answer: • Organizational memory. • Physical documents (printed out forms, etc.). • Colleagues and getting the answers physically contacting. • All the needed information is in private folder.
4. What is the purpose of knowledge sharing in organizational memory where all colleagues could find it? Could be more than one answer: • To facilitate knowledge sharing with another team members. • Because it is easier to mark the process of work performed. • This will help in the future when the team must perform similar tasks repeatedly. • This makes it easier to get a report on the work done from the employee. • Other.
5. On a 5-point scale, rate all statements that reflect the presence of knowledge sharing culture existence in organization: • Apply the accumulated knowledge in everyday activities • You are not afraid to delete unnecessary files in the company • You store knowledge in a place accessible to everyone • You also inform other team members about the new knowledge, emphasizing its benefits will provide
6. Note how strongly (1 to 5) the processes below are reflected in your company.

- Knowledge transfer
- New knowledge creation
- Communication about new knowledge that occurred
- Sharing of new created knowledge
7. What are the important components of the knowledge sharing process in the company that are still lacking in your eyes now? How could this be improved?

Table 21. *Questionnaire about learning in organization*

Learning:
Do colleagues openly discuss their mistakes by encouraging others to learn from it? Does it create new knowledge?
Do people get rewards from adding their perspective in process mechanisms learning them to grow and create new knowledge?
Are people not afraid to give one another feedback about their work habits and discuss about it?
Do employees have an ability to ask why in organization and these why questions regardless of their rank?
Do people have an opportunity to determine their needed skills for their future?
Do employees have time to develop learning?
Is there two-way communication on a regular basis in organization?
Is Lessons learned available for everyone? Can colleagues exchange their information?
Do team members discus their achievements and problems inside? Does this lead to new knowledge creation?
Does organization have up-to-date database of employee know-how? Can you describe the system and a few pros and cons? How knowledge creation process in this system looks like?
Are people motivated to think from a global perspective?
Are people encouraged to bring the customers' views into the decision-making process?
Are people encouraged to get answers from across the organization when solving problems?
Is percentage of total spending devoted to technology and information processing is greater than last year?
Is the number of individuals learning new skills is greater than last Year?
Is the investments in tools/solutions for creating greater learning satisfaction was increased compared to last year?