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HOW AND WHY DO ORGANISATION LEARN FROM PROJECTS. PROJECT KNOWLEDGE TO KNOWLEDGE PROJECT PORTFOLIO

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Abstract

Implementation of projects is a natural mechanism for companies to implement changes, innovations or improvements. In recent studies a lot of attention has been especially devoted to the collection of knowledge and knowledge management as the critical factors and the continuing use of this knowledge in the organization. The flow of project knowledge - vertical and horizontal - is frequently inconsistent and often varies within the same organization. Especially large, multi-branch global companies struggle to define a list of all ongoing and planned projects. Hence many initiatives are duplicated. Frequently separated but redundant solutions are created from the scratch. The authors decided to analyze how and why the knowledge about projects and knowledge of the projects is collected and how this project knowledge is codified in Polish globally operating companies.

The purpose of this article is to study the existing project knowledge processes and their use at the enterprise level. On the basis of this analysis, the authors have proposed a simplified diagram of the vertical and horizontal knowledge flow within an organization - and the central point of knowledge about / in / from projects – knowledge project portfolio.

The study consisted of several standardized, open-ended interviews with the members of the top management, boards, executives and projects managers employed by medium and big companies implementing IT projects in Poland. Then, basing on the analysis of the results, the knowledge flow diagram was created. The studies are preliminary and they are a contribution to further research on the verification of the use proposed scheme.

Key words: *project knowledge management, knowledge management, project management*
JEL code: M15, D83, O22

Introduction

The subject of knowledge management is currently a very popular area of research. It is reflected, among others, in the numerous publications. The number of works that contain the term "knowledge management", which have been published in the EBSCOHost database since 2000 has reached 40 221 items (as of 20.01.2017). Furthermore, starting from the second decade of this century, the number of new publications in the database exceeds 2500 each year. Knowledge management as one of the directions of the development in management science emerged in the 80's and 90's of the twentieth century. The concept of knowledge management has gone through a number of research approaches, practical applications and tools. In terms of research perspectives several trends can be distinguished.

One of them is the Knowledge-Based View of the Firm (Grant, 1996; Grant, 2002), which is, in a way, an extension of the theory of Resource Based View of the Firm. In this theory, knowledge is treated as a strategic resource that gives a competitive advantage. This is particularly important in the economy changing from an economy based on material production to an economy based on knowledge and information. This view has been criticized because of the way it emphasizes the role of an employee in its considerations and analyses and neglects the role of the company owner (Foss, 1996).

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Knowledge management at the level of the organization can be considered as a broader information system (Alavi, Leidner, 2001; Markus, 2001; Gold et. Al., 2001). Alavi and Leidner proposed a framework to analyze the role of knowledge management systems within the organization pointing to four main knowledge processes:

- knowledge creation,
- knowledge storage and retrieval,
- knowledge transfer,
- knowledge application.

Knowledge management is also explored from the perspective of comprehensive organization management (Drucker, 1992; Cummings, 2004; Singh, 2005), from the perspective of organizational learning (March, 1991; Nonaka, 1994; Cramton, 2001) or strategic approach (Grant, 1996; Dyer, Noboeka, 2000).

The knowledge management is particularly important in project management. This is due to the nature of the project as a undertaking limited in time, with a predetermined beginning and end, one-time only, resulting in a specific product. This creates challenges for knowledge management in projects. Among them the following can be distinguished (Lindner, Wald, 2011):

- uniqueness of products and temporary character of project organizations, which are obstacles to the creation of organizational routines, organization memory and learning,
- lack of continuity of cooperation, personnel fluctuation, which cause disappearance of both individual and organizational knowledge,
- lack of mechanisms of natural learning which are characteristic for permanent organizations; it is a particular difficulty in the implementation of projects in different geographical areas, ethnically and culturally unlike,
- the contrast between short-term orientation of the project and long-term orientation of knowledge management in which an interval between the effects and the investments made is accepted and even assumed.

Knowledge management in projects need to be seen in three time dimensions (Kozarkiewicz, 2012):

- the perspective of the past, which is a collection of experience, knowledge and skills resulting from previously implemented projects.
- the perspective of the present, that is the context of ongoing projects in portfolio which result in restrictions on access to resources as well as opportunities for sharing experience and creating value for stakeholders,
- the perspective of the future, that is an increase in the potential of knowledge and skills to be used in future projects, expected by the organization and its employees.

Objectives that are set for knowledge management in projects are identifying and acquiring new knowledge from internal and external sources, developing existing knowledge and the creation of knowledge on the basis of ongoing projects, documentation and storage of knowledge in such a way that it is accessible to employees and secured against unauthorized access (Wąsowicz, 2013). The knowledge accumulated in such a way can be classified in four groups (Trocki, 2011):

- knowledge of terminology (glossary, definitions for further use in descriptions)

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- theoretical knowledge (description of cause-and-effect relationships in the project environment)
- methodical knowledge (pragmatic)
- normative knowledge (needs, expectations, evaluation, quality criteria).

Project knowledge management is a crucial issue in terms of effectiveness of the projects implemented in the organization. Therefore, it seems reasonable to ask how project organizations manage knowledge. What is the process of organizational learning? Why do project-based businesses tend to select certain ways of knowledge management and not the others? Therefore, the purpose of this article is to analyze the existing project knowledge processes, and their application at the enterprise level. Based on this analysis, the authors have proposed a simplified diagram of the vertical and horizontal knowledge flow in the organization and the central point of knowledge about /from/in projects - Knowledge Project Portfolio.

Research results and discussion

In the first part of the study the researchers decided to look at the flows of the streams of project knowledge in organizations. The main objective of the empirical research was to investigate the perceptions of the respondents in terms of their subjective experiences, their feelings concerning management, use and reuse of project knowledge. It was essential for the research to narrow down the sample group of potential respondents to people acquainted with the characteristics of the project environment, project sponsors or decision-makers taking final decisions about the initiation or completion of the project. Therefore, the selected group of respondents consisted of representatives of the organization senior management, project managers, employees of PMO and people responsible for the coordination of project portfolios.

With carefully selected base of 400 contacts from leading companies more than 50 meetings were confirmed. Finally, the study involved forty three employees from global companies operating on the Polish market. The study had the character of pilot studies aimed at exploration of the subject issues. The research was carried out in the form of individual interviews, both categorized and uncategorized, depending on the individual characteristics and the openness of the respondent (Wengraf, 2001; Hove et al., 2005). Such an approach has enabled examination of the study area in its natural context and circumstances, along with more in-depth understanding of the phenomenon. Therefore, it was more broadly insight than just based on the analysis of variables.

After completion of the study and analysis of the results - in addition to consistent conclusions concerning the layer of flow and project knowledge preservation - the authors have created a high-level diagram representing the flow of project knowledge in the organization. In the first part of this study the results of empirical research have been concisely described. In the second one, the above-mentioned knowledge flow diagram has been proposed and discussed.

Project knowledge dimensions

The essence of the usefulness of project knowledge was the subject of direct examination. All respondents pointed to its importance and the necessity of possessing a certain predefined organizational framework sanctioning its identification, collection and use. It is worth mentioning that all of the respondents explicitly perceived project knowledge in a positive way, and pointed to the direct and indirect benefits from its use as regards the project:

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- facilitates the introduction of new team members to the project;
- collection of project knowledge is useful, especially in companies with a large staff turnover;
- enables learning from one's own mistakes;
- enables learning from others' mistakes;
- thanks to these, the company accumulates knowledge and experience, which helps with subsequent projects.

However, only half of the respondents demonstrated understanding of a broader perspective in terms of organization. They perceive a strategic dimension, long-term impact and effect of scale:

- *enables building of knowledge about the organization for which the project is being implemented, which is often valuable in long-term relationships with customers;*
- *allows to achieve synergy during implementation of a similar project;*
- *healthy proportions in our project basket are retained;*
- *only projects consistent with our strategy and vision of the board are carried out;*

The following characteristics were dominant and often repeated in the respondents' statements on acquiring and organization of knowledge at any stage of the project:

a. each project has a unique resource within the IT infrastructure, where all types of project materials are gathered,

b. the project team (only selected people) can have access to all knowledge bases regardless of the project they are currently working on,

c. apart from the standard classification, materials are ranked with tags or keywords (some respondents pointed out that the dictionary of available options is limited and maintained centrally),

d. access to the part of the material is limited and controlled (e.g. financial data or reports on work effectiveness).

Most respondents indicated that for them knowledge management is a controlled process, regulated by internal policies or the application of adopted project management methodologies (e.g. Prince2, PMI) at the level of the organization. However, most of respondents do not have the awareness of the need for ongoing gathering of knowledge. The majority indicates that knowledge is codified primarily at the end of the project in the form of summary reports or so called "lessons learned" sessions. Then, the knowledge codified in such a way is placed in a certain deliberately designated place where, over time, it becomes outdated. The awareness of the process is present, although the consequences of following it are blurred. Exactly the same situation applies to the subsequent knowledge sharing. Uploading the project materials onto the corporate intranet "closes the case" in most situations. Senior management and portfolio managers pointed out that during the project or after its completion the knowledge is easy to find, but only for the people working in the project environment. For the people outside the project team or new employees the project knowledge is not easily available and incomplete. The more inquisitive ones are able to reach and find only some limited information. In larger organizations, we observed various approaches and methods of gathering knowledge differing depending on the division, geographic area or department. It was an additional impediment to flexible and rapid knowledge acquisition.

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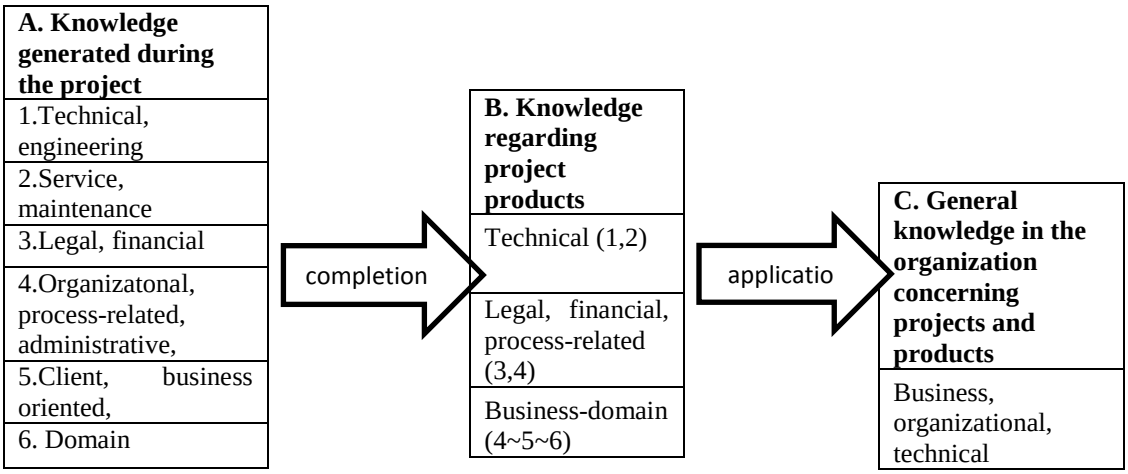

Source: Author's own research.

Fig. 1. **Changes in the scope of project knowledge availability over time**

Fig. 1 shows that the scope (and/or availability) of knowledge which was collected (regardless of the project cycle phase) decreases over time and level of organization. Respondents indicated that in the project there are appropriate people, who, in a sense, by definition of their functions, deal with collecting and maintenance of knowledge (e.g. Technical Manager - technical documentation, Analyst - domain knowledge etc.). Then, after the dissolution of the project team in the organization the project as such becomes less important. It is the product of the project that the employees remain aware of, and besides that it's only some high-level, general information about the projects and products. It is worth mentioning here that at the time of initiating of coming projects, the respondents indicated they acquire knowledge in a more or less formal way:

- use a company-wide database of projects and products (if there is any) or the intranet;
- search for help of dedicated business units or projects support and project offices regarding ongoing initiatives;
- informally contact potential knowledge holders (frequently former team members);
- contact representatives of various departments to see if they have the relevant data;
- seek help from their superiors;
- use internal forums, Wikipedia, social media, task management systems;
-contact portfolio managers or project coordinators;
-contact risk or security department (indicated by the majority of the respondents).

Knowledge is widely dispersed and often partial, loosely connected or inconsistent. There is no single point of knowledge acquisition. Hence the process is superficial and inaccurate or laborious and time-consuming. Project-related knowledge (Fig. 1, square A) is relatively wide and detailed, but mainly collected at the end of the project. Knowledge on the organizational level (Fig. 1, square B, and C) is a certain extract of project knowledge, which in its incomplete form is used as an input when initiating new projects or as a reference material to the decisions taken at the level of portfolio, department or across the enterprise. It is worth emphasizing that

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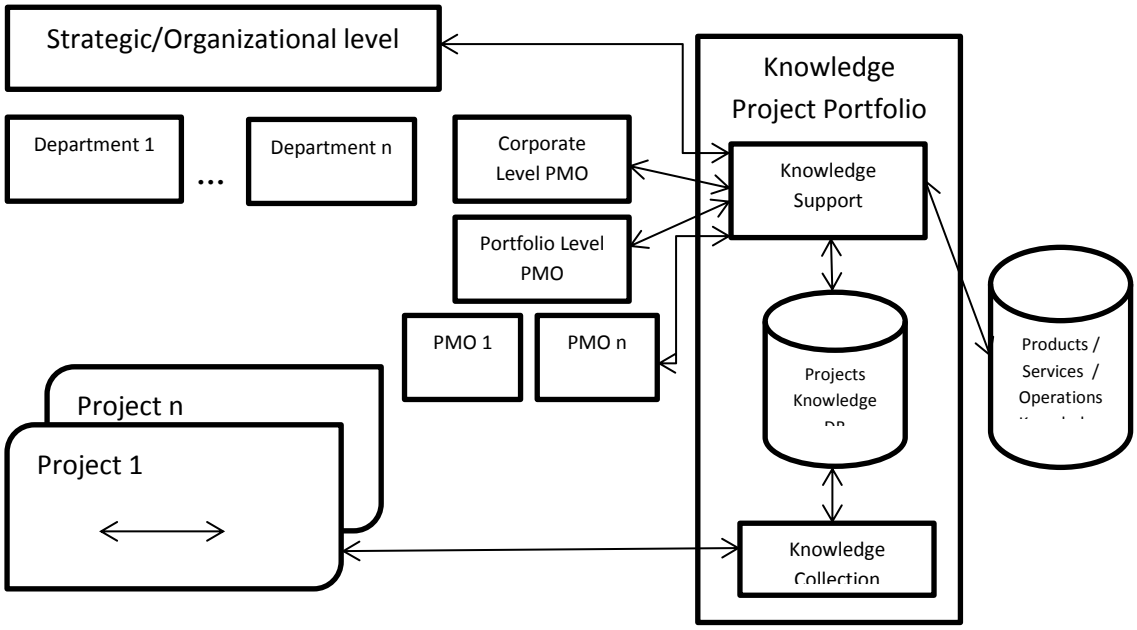
new projects usually have contact with the knowledge processes only at the moment of their initiation and their completion.

Project knowledge flow diagram - knowledge project portfolio

During the study, respondents indicated various concepts of solving problems related to disappearance and availability of project knowledge over time at the organizational level. After collecting all the conclusions the authors visualized project knowledge horizontal and vertical flows within the organization. The aggregate results are shown in figure 2 below.



Source: author's diagram based on Basili V.R., Seaman C., 2002.

Fig. 2. **Project knowledge flow diagram – knowledge project portfolio.**

Project knowledge flow diagram in this article is henceforth called KPP (Knowledge Project Portfolio). It has been based on the concept of Experience Factory (Basili V.R., C. Seaman, 2002) created for software development projects. This concept assumes that organizations producing software can improve their efficiency and effectiveness using experience from any previously completed projects by creating a special unit dealing with processing knowledge. As indicated in Figure 2, it is recommended to establish a dedicated unit of KPP, which will be the central place of aggregation, processing and further distribution of knowledge in the organization in the knowledge-on-demand mode. KPP is the unit independent of the industry and the nature of the project. KPP consists of:

-Knowledge Support - a unit dedicated to the exploration, distribution of knowledge on demand to meet the needs of other organizational units of a certain level of granularity of knowledge and information. In addition, it is the interface for the company-wide databases, where information on all processes, services, products or operations (project products) is collected;

-Project Knowledge DB - multidimensional knowledge system, adapted to the needs of the organization in terms of its construction, access scheme, knowledge update and obsolescence

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processes, unified and mapped onto the current structure of the company. Project Knowledge DB is the main driver and a point of project knowledge accumulation, structured appropriately to the needs of the enterprise;
-Knowledge Collection – a unit whose aim is ongoing collection of project data for Project Knowledge DB. It is proposed that in each project there should be at least one person who - for the duration of the project - will be also part of this unit. An additional responsibility is to periodically verify the quality of data flow from projects and to projects.

The central point of project knowledge would reduce an access time to knowledge and facilitate its flow. It would organize its scope and systematize the cycle of its life. Potentially, it would also increase the quality of planning and execution of projects, support more effectively decision-making process regarding commencing/terminating initiatives. It would also allow to preserve the relevance and topicality in the course of time, thanks to synchronizing/linking project knowledge with organizational knowledge (figure 2 - Products / Services / Operations Knowledge database). However, the mere creation of an additional level of project knowledge management, a separate unit of the KPP in the organization, as it was noted by most respondents, will result in an initial increase in funding at the project level and across the organization. In addition, such newly formed unit, in order to operate effectively must be adequately supported by management and has legitimate mandate from organization. The project knowledge flow diagram presented above is very limited, as it covers only high-level assumptions. Potentially applicable character of this solution would have to include the creation of dedicated tools, organizational and project roles along with a system of evaluation of its use.

Conclusions

In any organization the learning process is different. The cognitive or social dimension of knowledge processes depends very much on the specifics of the industry and the nature of the projects implemented. It also applies to the level of adaptation and the degree of implementation of various methodologies and standards by organizations. The studies were just preliminary and limited because of a relatively small sample size. Nevertheless, these merely initial studies already imply that awareness of the significance of project knowledge management is high and partially formalized. Unfortunately, the value of project knowledge erodes and decreases over time.

A similar effect of knowledge blurring is caused by its horizontal propagation in the organization and propagation from project units to conventional organizational units. Following the research, the authors suggest a potential solution to this problem through the creation and implementation of a dedicated unit, for the purposes of this article called - knowledge project portfolio (KPP). This unit would deal with the knowledge maintenance processes both in the implementation phase of the project and after its completion at all levels of the organization in a central and sanctioned manner. Such result and product of the research opens up further opportunities in the field of scientific exploration aimed at verifying the applicability of the discussed knowledge flow diagram and the KPP itself. Potentially, other streams of research may lead to measuring the maturity of project knowledge management through the creation of dedicated, industry specific models of project knowledge management maturity.

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