EFFECTIVE KNOWLEDGE MANAGEMENT IN AGILE PROJECT TEAMS - IMPACT AND ENABLERS*

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Abstract

Nowadays, rapid response capacity of organization is a very important in business due to the strong market competition. Large-sized enterprises are providing advanced business services and products to their customers through complex, innovative and unique projects and programs. One of the key challenges in the project and program management is the right knowledge management. The appropriate selection and effective application of the most valuable knowledge is the essential concern in project management.

The main goal of this article is to present the impact of knowledge management on Agile project teams. The article identifies also key enablers for effective knowledge management processes in Agile project teams.

Empirical research studies were conducted in large ICT and IT organizations based on triangulation of research methods: a questionnaire survey, own observations and observations of other Agile project team members' and interviews with Agile experts'.

Primarily, effective application of knowledge management solutions in Agile project teams is important for collaboration of project teams; moreover it is important to the whole level of an organization. The research results showed four key effectiveness enablers of the knowledge management processes: a learning organization, an organizational strategy, an organizational structure and an organizational culture, with the latter indicated as the key success factor of Agile project teams and Agile organizations deployment.

Key words: *project management, knowledge management, process enablers, agile, organizational culture*.
JEL code: D83, M14, O22.

Introduction

Contemporary organizations are delivering increasingly complex and advanced products and services to their stakeholders and customers. Complexity, communication and operation scalability are driving them towards project- and task-oriented enterprises. Following this approach, several

* *Second Editions are previously published papers that have continued relevance in today's project management world, or which were originally published in conference proceedings or in a language other than English. Original publication acknowledged; authors retain copyright. This paper was originally presented at the 5th Scientific Conference on Project Management in the Baltic States, University of Latvia, April 2016. It is republished here with the permission of the author and conference organizers.*

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project management methods were developed in the last few years. A number of Agile project management methods has attracted attention very recently (Medinilla, 2012; Goodpasture, 2015; Maximini, 2015) as they work towards increasing effectiveness and speed up delivery of customer products and services.

On the other hand, a strong market competition has raised a lot of challenges to the effective knowledge management in the large-scale organizations. Digitization and pervasive Internet access highly increased the volume of data, information and knowledge shared within organization and within its business environment to the unconceivable order of magnitude, causing an increased impact of the effective knowledge management on large-scale project organizations (Mueller, 2015; Santos et al., 2015; Wyrozębski, 2014). The just-in-time and fast application of the most valuable knowledge in customer products and services is a key competence of the large project organizations needed in order to gain a competitive advantage.

The main goal of this article is to present the impact of knowledge management to the Agile project teams. The article also indentifies the key enablers for the effective knowledge management processes in the Agile project teams. The empirical research results have revealed a significant impact and importance of the knowledge management to the Agile project teams, to the collaboration between project teams and to the whole organization and its stakeholders as well. The research results showed four key effectiveness enablers of the knowledge management processes: a learning organization, an organizational strategy, an organizational structure and an organizational culture. The author's empirical research results are confirmed by and complemented with a review of the existing literature in the field presented in this paper. The aim of this paper is not to focus on improvements and enhancements in these four key identified enablement areas; still some interesting examples of practical solutions may be found in the unpublished author's MBA thesis (Paterek, 2014).

The empirical research study was conducted in large ICT and IT organizations with triangulation of the research methods applied: a questionnaire survey, own observations and observations of other Agile project team members and interviews with Agile experts. The sampling frame limited only to large ICT and IT organizations is potentially one of the key limitations of this research. Another limitation may be the number of responses; nevertheless, it was mitigated by the number of valuable observations and expert's interviews. At the same time, these limitations indicate some potential directions for the future research in the field.

The structure of the paper is as follows: the first part discusses the research results; the second part contains conclusions, proposals and recommendations. The first main part is also divided to subchapters; with chapter one presenting a review of the existing literature, chapter two - the methodology approach, chapter three – the research results and finally, chapter four discusses the research results.

Research results and discussion

Knowledge management impact and enablers

The strong competition on the market and the information and communication technology (ICT) development have raised a lot of challenges to the project based organizations (Kozarkiewicz, 2012 : 36), especially to work organization methods used by project teams. The knowledge management impact to the project organizations is one of the key identified challenge in the highly advanced IT and telecommunication sector. These organizations are flooded by information sources and, at the same time, struggle with the issue of selecting and applying the most valuable

knowledge. This causes entropy in work organization methods, both on the level of project teams and on the level of the enterprise. New, contemporary project organizations should be: "agile[‡], adaptive, self-regulating, self-optimizing, with fuzzy borders, mesh-like structure, self-aware, aware of the markets, able to learn from market, adapt to the market and able to morph into new and better forms" (Delic and Dayal, 2002 : 3-4).

The agile organization approach and the agile project management approach are presented by many experienced practitioners in their guidebooks (Highsmith, 2009; Goodpasture, 2015; Medinilla, 2012), as well as by the project management researchers (Fernandez and Fernandez, 2008; Vazquez-Bustelo et al., 2007). The Scrum method (Chrapko, 2013; Maximini, 2015) is indicated as the most widespread and recognized Agile implementation in the industry reports (VersionOne, 2015). Innovation and a relatively new concept of the Agile approach have risen a new demand for standardization and certification in the project management world. The Professional Scrum Master, the Professional Product Owner or the Agile Project Management Certification are just examples of a growing demand for the professional project management certification and standardization in the PM world (Ilmete et al., 2011 : 145-152).

The knowledge management processes namely, knowledge creation/acquisition, knowledge storage, knowledge dissemination and knowledge application are those mentioned in many knowledge management anatomy publications (Kowalczyk, Nogalski, 2007 : 80). Knowledge acquisition is understood mainly through the external knowledge sources, i.e.: a business environment, customers, stakeholders and competitors. The two types of knowledge: explicit knowledge (described with numbers, science or manuals) and tacit knowledge (the emotional, difficult-to-describe and hidden) are coupled with four creation processes (Nonaka, Takeuchi, 1995):

- Socialization - Tacit to Tacit,
- Externalization - Tacit to Explicit,
- Combination - Explicit to Explicit,
- Internalization - Explicit to Tacit.

Knowledge sharing in the Agile environment is less formal and more fuzzy as this is basically a tacit type of sharing. In Agile methods, knowledge sharing is embedded in several activities: release and iteration planning, pair programming and pair rotation, daily Scrum meetings, cross-functional teams and retrospectives (Sivanantham, 2011).

The effectiveness of the knowledge management processes is a derivative of number of different enablers in the project organizations and in the project teams. The most relevant theoretical studies in the knowledge management in the project environments with the focus on the Agile project management, as well as the brief findings and its conclusions are presented in Table 1.

Figure 1 presents a summary of the literature review detailing the number of publications related to a knowledge management effectiveness enabler, both directly and indirectly mentioned in the text. The literature review presents enablers, where organizational structure, learning organization, organizational strategy and organizational culture are mentioned the most frequently in the literature.

[‡] Agility as an organization feature means the ability to respond rapidly and intentionally to a changing demand whilst controlling the risk, efficiently adapt and innovate as well as shrinking the feedback loop.

Table 1

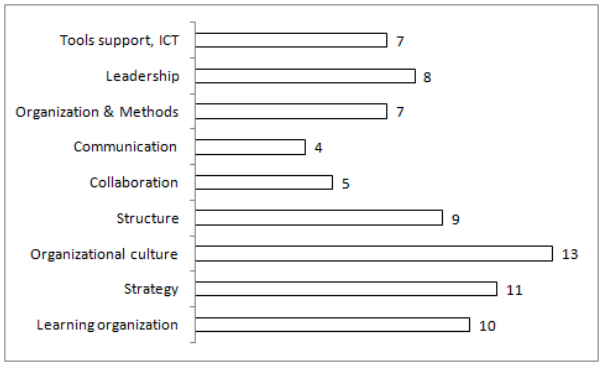
Knowledge management enablers in project organizations and in the project teams

Studies the most relevant to the knowledge management (KM) impact in project management (PM) with the focus on the Agile project management. Brief findings and conclusions.	The key knowledge management processes enablers for the project teams: X – directly mentioned in research or s study, (X) – indirectly derived from research or a study.								
	Learning organization	Strategy	Organizational culture	Structure	Collaboration	Communication	Organization & Methods	Leadership	Tools support, ICT
Hanish et al. (2009) - factors critical for successful project knowledge management, organizational culture as a critical factor.	(X)		X			X	X	(X)	X
Santos et al. (2015) – knowledge sharing between Agile project teams.	(X)	X	X	X		X	X	X	
Lee and Choi (2003) – KM enablers for the organizational creativity and performance.	X	(X)	X	X	X				X
Oliver and Kandadi (2006) – factors affecting KM culture in large organizations.	X	(X)	X	X	(X)		(X)	X	X
Pérez-Bustamante (1999) – KM culture in the Agile innovative organizations.	X	(X)	X	X					
Wyrozębski (2014) – state of project KM, conditions and business impact (in Poland).		X	X				X	X	
Kamhawi (2012) – critical success factors to reach organizational performance and agility.	X	X	X	X				X	X
Oliveira (2012) – KM implementation enablers.	X	X	X	X		X		X	(X)
Misra et al. (2010) – Agile adoption enablers.		X	X				X		
Dove (1999) – KM in the agile enterprise.	X	X	X						
Nerur et al. (2005) – Agile migrating issues.			X	X	X		X	X	X
Vazquez-Bustelo et al. (2007) - Agility drivers, enablers and outcomes, including KM.	X	(X)		X	X				X
Fong and Kwok (2009), Mueller (2015), Panasiewicz (2013: 73), Wiewiora et al. (2014) – organizational culture as key KM processes enabler in the project teams and organization.			X						
Kozarkiewicz (2012: 183-190), Paterek (2013: 37) – continuous learning and KM in the project organization and in the project teams.	X								
VersionOne (2015) – a report presenting barriers to effective Agile deployment in project teams.		(X)	X	(X)	(X)	X	(X)	X	

Source: author's structure

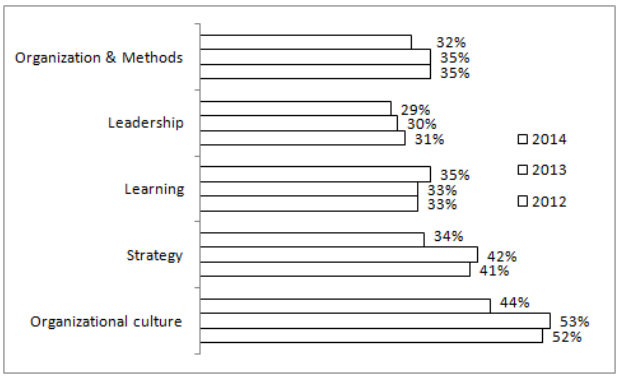
Figure 2 presents the top five barriers to further Agile adoption according to V1 enterprise report (VersionOne, 2015). The respondents can check more than one barrier to adopting the Agile approach. The classification of the barriers is the author's concept based on the best match. All the barriers used in the classification are related to knowledge management in the Agile environment as well.

Fig. 1. **The number of the KM enablers – desk analysis**



Source: author's structure

Fig. 2. **Top 5 barriers to Agile adoption – V1 reports**



Source: author's structure based on VersionOne (2015)

The V1 results analysis and author's classification revealed the following barriers to adopting the Agile approach: organization and methods (waterfall project methodology), leadership (management support), learning (lack of skills), strategy (resistance to change) and organizational culture (complex change). The last three years' trend showed that the impact of all the barriers was slowly going down, except for the learning area which demonstrated the opposite trend (VersionOne, 2015).

Methodology approach

The main goal of the empirical research presented in the paper is to confirm the importance of knowledge management to task and project teams which use the Agile method in their work organization. Another goal was to to identify the key effectiveness enablers of the knowledge management processes in Agile project teams. The investigated organizations are characterised by the large complexity of customer products and services they deliver; therefore, they face many issues in the area of cooperation and communication in and between project teams.

The research population is being defined as a task and project team members in the ICT (information and communication technology) and the IT (information technology) organizations with the Agile methods or its adaptations applied to their work organization. The following sampling frame was used by the author to select respondents for the research sample:

- a former or a present employee in a large national or multinational ICT and IT industry organization based in Poland,
- a former or a present team member applying Scrum method or its adaptation to their team work organization,
- a former or a present team member with Agile methods experience in the field, assessed by the author of this research, and therefore respondent whose answer is very likely relevant to received research results.

The author chose an intentional and non-random selection of respondents as the research sample method in order to create research sample closer to the representative one. The arbitrary selection of respondents was made by the author, who is a project manager in one of the investigated organization and, for this reason, he has sufficient expert' knowledge about the investigated population. Indefinite probability of representativeness is a drawback of the method. Another potential disadvantage of the empirical research may be a relatively small size of the sample (70 respondents) but, hopefully, it was mitigated by high probability of reliable answers from

respondents with experience in the field. A questionnaire survey was used as a research method to measure observations in the pre-defined respondent sample. More than 90% of the questionnaires were returned. The analysis is potentially limited because of the non-returned questionnaires which could not be analysed in the study. However, from the other hand, the applied triangulation of the research methods may be accepted as the imputation of the missing responses. The triangulation of the research methods included: the questionnaire survey, own observations and observations of other project team members and interviews with experts. In particular, the latter i.e. the experts' interviews was meticulously conducted, involving experienced and independent experts. They were invited both internally from the investigated organizations and from the outside e.g. from the nationally recognised experts in the field. The maximum absolute error value was estimated at 10-12%[§] with the 95% confidence level, the population size reached approximately 50,000 and the research sample consisted of 70 respondents. At the same time, all the above mentioned limitations may be explored as directions for the future research in this area.

The questionnaire survey was structured to intersect the Agile method plane (in our research the Scrum method or its adaptation) with the concept of the knowledge management plane. Each component of the Scrum method (Chrapko, 2013): the assumptions, the roles, the activities and the artefacts was matched with different levels of the knowledge management concept (Kowalczyk, Nogalski, 2007 : 81): tools, processes, structure and integration. The single choice questionnaire survey consisted of 40 questions divided into 4 parts: the respondent's personal details and three parts each for one Scrum method component. The respondents were asked to express their opinion whether a Scrum method component was supported ("Very Good", "Good") or was not supported ("Insufficiently", "Poorly") at the level of the knowledge management concept (Paterek, 2014 : 32-33).

Empirical research results

The research results presented in the paper are an extraction of unpublished empirical author's research analyzing the correlation between the Scrum method applied to the project team work organization and the knowledge management concept in order to identify potential practical improvements of the Scrum method. The identified improvements, together with the synergy of the Scrum method and the knowledge management concept, were aimed to increase the effectiveness and the innovation level of the task and project team work organization (Paterek, 2014 : 31). The research results related to the key indentified effectiveness enablers of the knowledge management processes presented in this paper have not been published in other papers. The more detailed research results associated with the organizational culture that are not presented in this paper can be found in other linked author's paper (Paterek, 2016).

63 filled out questionnaires were returned by respondents. The respondents' details regarding their Scrum professional knowledge and experience were matched with the author's research assumptions and with the defined sampling frame. Table 2 presents the research results about the respondents' details.

[§] The estimation based on the PBS website calculator: http://pbs.pl/x.php/1,139/dobor-proby.html [Accessed 3 January 2016].

Table 2

The Scrum professional knowledge and experience of respondents

	Question	Answer					
1	I have been using Scrum on a daily basis..	Less than 1year		1-3 years		More than 3years	
		20	32%	27	**43%**	16	**25%**
2	My role is..	Team Member		Scrum Master		Product Owner	
		29	46%	23	**37%**	11	**17%**
3	My Scrum professional experience comes from..	1 company		2 or 3 companies		More than 3 companies	
		46	73%	14	**22%**	3	**5%**
4	I participated in the Scrum training events..	0 times		1-3 times		More than 3 times	
		15	24%	36	**57%**	12	**19%**
5	I am a certificated Scrum expert..	Yes		No		Planned	
		11	**17%**	45	71%	7	**11%**

Source: Paterek (2014 : 34).

The response analysis for all remaining 35 questions resulted with a selection of 15 questions with the sum of “Insufficiently” and “Poorly” answers greater than or equal to the author’s criterion – 1/3 of all the answers. A further analysis of some selected questions and its synthesis with the concept of the knowledge management levels allowed to identify four key areas, which are subsequently referred to as the enablers. The identified effectiveness enablers of the knowledge management processes in the investigated project teams were: a learning organization, an organizational strategy, an organizational structure and an organizational culture (Paterek, 2014 : 35-40). Almost each of 15 selected questions can be interpreted from a different perspective of the investigated problem and classified to one of the four identified effectiveness enablers of the knowledge management processes. The assignment of the question to only one enabler theoretically indicates the best match according to the analysis done by research author (Paterek, 2014 : 38). Nevertheless, for the majority of the analysed questions, the holistic approach to assign all of identified enablers is probably the best approach.

The summary of the research analysis results as well as the summary of question synthesis and their classification to areas identified in the research is presented in Table 3.

Table 3

The key indentified effectiveness enablers of knowledge management processes

The effectiveness enabler of the knowledge management processes	The number of questions for which the sum of "Insufficiently" and "Poorly" answers is greater than or equal to 33% of all answers	The number of questions assigned each level of the knowledge management concept**			
		Tools	Processes	Structure	Integration
The learning organization – includes all knowledge management processes existing within the project teams, between the project teams, within the organization and even beyond the organization. It is related to both internal and external knowledge sources.	9	2	7	2	1
The organization strategy – covering all aspects of the utilization processes of the most valuable knowledge from the mission, vision and organization goals perspective, as well as the knowledge value protection.	2		2	1	1
The organizational culture – covering the creation and the formation of the core values system that is supporting all the knowledge management processes, both on the project teams' level and on the level of the organization.	2			1	2
The organization structure – covering all aspects of the organization structure adaptation to core values system that supports all the knowledge management processes, both on the project teams level and on the level of the organization	2			2	
The total number of questions matched to the identified enablers	**15**	**2**	**9**	**6**	**4**

Source: author's calculations based on Paterek (2014 : 38-40).

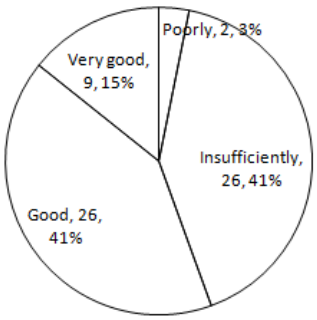
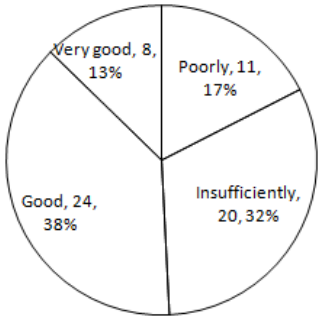
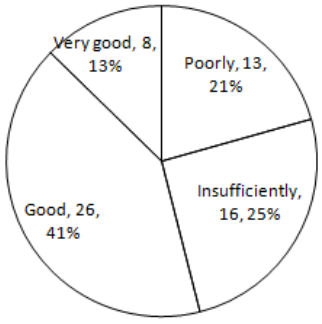
The impact of the key identified enablers on the effectiveness of the knowledge management processes in the Agile project teams was shown in the detailed questionnaire survey results presented in Table 4. The vast majority of responses in the "Insufficiently" and "Poorly" categories indicated a significant impact of the all identified enablers on the effectiveness of the knowledge management processes in the Agile project teams. From the practical point of view as well as for the purpose of the further theoretical analysis note that effectiveness of the knowledge management processes in the Agile project teams is also dependent on the synergy of all

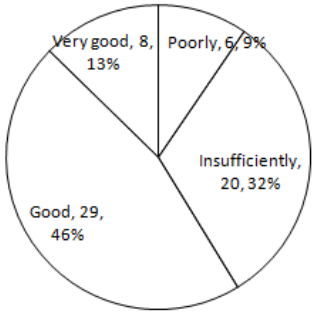
** One-to-many relation as the agile method component can be associated with the one or more levels of the knowledge management concept.

identified enablers. The identified enablers show a strong correlation. As a result, any improvement changes or solutions introduced in the one of the enabler are likely to show in the other three enablers. Moreover, the impact of all identified enablers and its synergy on the effectiveness of the knowledge management processes will be visible on different levels of the organizational operation.

Table 4

The questionnaire survey results

Representative questions demonstrating correlation between effectiveness enabler of the knowledge management processes and the Agile manifesto / the Scrum method assumptions	**The effectiveness enabler of the knowledge management processes**	**The questionnaire survey results**
Question 19. The Agile manifesto and the Scrum method assumptions support the organization management with the effective management of the knowledge transfer processes and with the effective application of the most valuable knowledge (data, information, its context and experiences) in the organization and its products delivered to the customers.	The learning organization	
Question 15. The Agile manifesto and the Scrum method assumptions allow to create and develop a long-term strategy for the effective application of the most valuable knowledge (data, information, its context and experiences) and securing the most valuable knowledge.	The organizational strategy	
Question 20. The Agile manifesto and the Scrum method assumptions allow for creating a motivation system and forming an organizational culture associated with the processes of the effective knowledge transfer and with the effective application of the most valuable knowledge (data, information, its context and experiences) in the organization and its products delivered to the customers.	The organizational culture	

Question 17. The Agile manifesto and the Scrum method assumptions allow for creating the organizational structure supporting processes of the effective knowledge transfer and effective application of the most valuable knowledge (data, information, its context and experiences) in the organization and its products delivered to the customers.	The organizational structure	

Source: author's structure based on Paterek (2014).

The following own observations and observations made by other project team members indicated many other conditions and effectiveness enablers in the knowledge management processes, e.g.: the opportunity to learn through the real work assignments based on the successes and failures, an openness to experiments and innovation, continuous development and upskilling opportunities, budget allocated to training and conference participation, uncertainty perceived as a source of inspiration and innovation, expanding the scope of the people decision-making competences and responsibilities, a well-defined and predictable organizational strategy, a knowledge management strategy coupled with the working action plan, an evolutionary and conscious change management, the common vision, mission and strategy fair from people perspective, a clear motivation and payroll system, job satisfaction, the organizational trust as a core system value, the core system values allowing to form and to support the organizational culture, the direct and effective communication, the appropriate leadership, the organizational structure supporting collaboration and reducing bureaucracy (Paterek, 2014 : 52-57).

The knowledge management impact on the agile project teams as well as the organizational culture as one of the key enabler of the knowledge management processes effectiveness is confirmed by the questionnaire survey results and the above-listed observations. Moreover, it is confirmed by interviews with external and independent experts as the following example:

"The Scrum method is based on a very different mental model, which is often called "a paradigm". It strongly enforces changes in thinking model of the organizational operation. However, the Scrum method deployment is not a simple delivery of the key problem solution. I work with large organizations and every time the process looks very similarly – the need for changes in the organizational system is identified through the Scrum method implementation. I realize this stronger during each new one implementation. The Scrum and Kanban method are "applications" that need to be installed on the right application platform. It is the organization's responsibility to provide it. The organizational culture, the core system value, the leadership, the language and communication are the components of this application platform. These components are assumed in the Scrum method, but without detailed solution implemented within. What is more, implementations in large organizations show that most issues to address are exactly there. Unfortunately, most organizations are focused on techniques, roles, artefacts, ceremonies... These tools allow for achieving fantastic results, but they have to be installed on the right application platform. Otherwise, there may often appear "culture shock" A. Toffler's effect." - Mariusz Chrapko[††] (Paterek, 2014, s. 69).

Results discussion

The questionnaire survey results, author's own observations, other team members' observations and expert's interviews revealed a significant impact of the knowledge management and, in

[††] Mariusz Chrapko: http://mariuszchrapko.com/ [Accessed 4 January 2016].

particular, a significant impact of the knowledge management processes on the Agile project teams and organizations. Such similar and comparable impact is recognised by a number of other research papers devoted to the knowledge management in the project environments (Hanish et al., 2009; Mueller, 2015; Wiewiora et al., 2014; Wyrozębski, 2014) as well as knowledge management in the Agile project environments (Dove, 1999; Pérez-Bustamante, 1999; Santos et al., 2015; Sivanantham, 2011). According to the main research result presented in Wyrozębski (2014), most respondent (80%) pointed out many of lost business opportunities due to difficulties with the efficient knowledge management.

The following author's research results (see Table 3 and Table 4) have indentified four key effectiveness enablers of the knowledge management processes shown in the Agile project organizations and, specifically, in the Agile project teams. These are, respectively: the learning organization, the organizational strategy, the organizational structure and the organizational culture. Based on the author's expert interviews and on papers and publications published by other researchers (Hanish et al., 2009; Mueller, 2015; Wyrozębski, 2014), the latter seems the most critical enabler for the successful knowledge management in the Agile project teams. The literature review (Table 1) and its graphical summary (Figure 1) were confirmed by the results of the empirical research (Table 3 and Table 4) and its four factors, which are critical to the effective knowledge management processes. Other top ranking factors and enablers in the literature review are: the leadership support, the tools & ICT support and the organization & methods. All of them and, in particular the last one – the organization and methods, which is specifically the Agile project management method, are also indirectly recognised as enablers in the author's empirical research. Collaboration and communication are less frequently pointed factors in the literature review (Figure 1); nevertheless they are also embedded in the organizational culture factor presented by the author's empirical research results.

The above theoretical and empirical research results are confirmed by the trend of the past three years shown in the industry reports with the following Agile adoption barriers identified in the areas of: organization and methods, leadership, learning, strategy and organizational culture (VersionOne, 2015). The leading causes of the failed Agile projects are also correlated to theoretical and empirical research results, respectively, most of the respondents pointed to knowledge as the key cause – "lack of experience with Agile methods" (44%) and two of the top five causes of failure were associated with the company culture – "company philosophy or culture at odds with core agile values" at 42% and "lack of support for cultural transition" at 36% (VersionOne, 2015).

Conclusions

The knowledge management paradigm is relatively new and its importance to for new contemporary and intelligent project organizations has even gone up. These project organizations stimulate continuous research and development to find the most effective project and knowledge management methods in their strive to become market leaders or, at least, one of the leading competitor. Note that not all success factors from the past must be continued to guarantee a present and future success of an organization.

The following key conclusions are the main research findings:

1. The research results proved a significant impact of knowledge management on Agile project teams. Agile methods can support knowledge management in project teams very well on the tools and processes levels, while the impact of structural and integration levels is not equally powerful.

2. Four key effectiveness enablers of the knowledge management processes in the Agile project teams were identified. These are: a learning organization, the organizational strategy, the organizational structure and the organizational culture. The right work organization methods like the Agile project management methods are indicated indirectly as another key effectiveness enabler of the knowledge management processes.

3. The most important cognitive conclusion of the paper is the impact of the knowledge management as an antecedent of the effective knowledge management processes in the Agile project teams. The knowledge management processes in project teams are well supported by Agile methods whilst the organization-related context emerges as essential, and, in particular, the organizational culture.

4. The key to success of the Agile method implementation is not only related to changes in the project team level, but it is primarily related to changes on the level of the entire organization and its functional operability. The primary focus is to create and form the right organizational culture supporting implementation of Agile methods across the entire organization. This way, both project teams and organizations will benefit from more effective knowledge management processes. In the author's opinion, this is also the main, valuable conclusion from the practical perspective.

The key proposals and recommendations are as follows:

1. The Agile methods require some adaptation and potential enhancements at the structural and integration levels of the knowledge management concept, in particular in order to increase effectiveness of the knowledge management processes between project teams.

2. As all the identified enablers apply to the organization as a whole, the best proposal might be to use a holistic approach: the learning organization, the organizational strategy, the organizational structure and the organizational culture enablers and its synergy to create one comprehensive solution for effective knowledge management in the Agile environment.

3. Effective project team's collaboration, right communication and appropriate organizational culture that support sharing and application of knowledge management processes are challenges faced the Agile Project Manager.

4. The main limitation of the empirical research discussed in the paper might be the sampling frame which only includes large ICT and IT organizations. The number of responses may be considered another limitation; nevertheless, it was mitigated by a number of valuable observations and expert's interviews. The sampling frame and the population changes offer interesting directions for the new research opportunities. Project method, organization method as well as organizational culture in the large organizations environment seem to be important enablers for the effective knowledge management processes and, at the same time, the ones that require further studies and research.

The digital future, rising entrepreneurship and global marketplace have been introduced a lot of challenges to the contemporary project ICT and IT organizations. Furthermore, the knowledge management impact has increased in these organizations. The diversity of complexity and communication issues together with strong competition market stimulates the project organization development, in particular its methods and organization. The Agile project management and the

Agile organization concept is proposed as a solution addressing the above issues in the project management area. In order to increase effectiveness of the knowledge management processes in the Agile organization environment, several potential improvements and enhancements are needed, mainly to the learning organization, the organizational strategy, the organizational structure and the organizational culture areas. The continuous, long-term and evolutionary changes need to be carefully introduced in all these areas, in particular in the organizational culture, which is relatively the most difficult one. In addition, further comprehensive studies as well as empirical research is needed in this area.

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