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VALIDATION OF KNOWLEDGE MANAGEMENT INTERVENTIONS FOR LEAN TRANSFORMATION IN IT R&D SERVICES ORGANIZATION

RESEARCH PLAN

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1 Background

IT service industry promotes the intellectual development of individuals to gain advantage over competitors (Govander & Pottas 2007, p. 37). Managing knowledge is an important factor to run sustainable business in IT services industry. The role of knowledge management (KM) is to support business goals of the organization. To improve their business processes, organizations have started to adopt Lean thinking (Womack & Jones 1996, Liker 2004).

Lean thinking is gaining more and more interest also in IT service industry, but adopting lean thinking within an organization is not straightforward. In this context, we can study KM barriers for lean transformation, and based on that, design KM instruments and interventions to support it. For the proposed research, a global IT services organization (Tieto Oyj), undergoing lean transformation, is selected for a case study. The organization in question provides software development services for customers. In the following chapter, I will explain the key concepts, motivation and references to prior research, regarding the proposed research.

1.1 Key concepts

Knowledge management in an organization relates to knowledge generation, transfer, accumulation, adoption, and diffusion (Disterer 2001). Because KM is such a wide concept, a suitable framework needs to be selected. The global knowledge management framework (GKMF) (Pawlowski & Bick 2012) provides a global context and takes into consideration instruments and interventions, which is required for the proposed research. Using GKMF, it is possible to reflect KM interventions for lean transformation. Interventions or instruments describe methods and activities to realize knowledge processes that enable knowledge management. There are two main categories, human-oriented and technological instruments. (Pawlowski & Bick 2012.)

To understand the challenges of KM in lean transformation, we use the concept of barriers. Barriers relate to social interaction, and as an example, to factors that hinder or challenge knowledge exchange (Pirkkalainen 2012). Understanding the KM barriers for lean transformation provides us a focus, when designing new interventions for supporting the KM in lean transformation.

Lean thinking originates from manufacturing industry. Eiji Toyoda and Taiichi Ohno from Toyota Motor Company came up with concept of lean production after the Second World War (Womack, Jones & Roos 1990). Womack et al. (1990) first introduced the term “lean”, and Womack and Jones (1996) later explained it to have been based directly on Toyota Production System (TPS).

In Toyota Production System, all the parts of the system contribute to a whole. Focus is on supporting and encouraging people to continually improve the processes they work on. TPS is based on 14 principles, such as: 1) Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals and 2) Create continuous process flow to bring problems to the surface and 3) Become a learning organization through relentless reflection and continuous improvement. (Liker 2004.). Lean principles address directly knowledge management and KM barriers.

1.2 Motivation and prior research

Lean thinking has spread from car manufacturing to diverse range of organizations across industries (Liker & Morgan 2006), just as Womack et al. (1990) predicted. It has been argued, that lean thinking does not suite knowledge work, because it is not repetitive and cannot be unambiguously defined (Staats & Upton 2011). However, the research by Staats and Upton (2001) shows, that lean principles can be applied to almost any kind of knowledge work and can generate significant benefits, such as faster response time, higher quality and creativity, lower costs, reduced frustration, and greater job satisfaction.

In knowledge work, knowledge of the company is its most important asset and problems related to knowledge management are the most important ones. Studying lean transformation from the knowledge management perspective should produce new understanding that can benefit organizations, which are interested in adopting lean thinking, and further research in the area of lean thinking and knowledge management.

Compared to research in knowledge management and lean thinking, there is not much research combining both. This was to be expected, as the premises are different. There is research about lean in software development (Ikonen 2011) and a research combining knowledge management and lean software development (Dahlke 2008). This encourages to further research lean and knowledge management together, in software R&D context. Regarding organization selected for a case study, there are articles about the history and used methods in their lean transformation (Turecek, Smirak, Malik & Bohacek 2010, Pro-

chazka 2012). The author of the proposed research works as a lean and agile coach in the target organization.

2 Research objectives and methods

The purpose of the research is to identify and validate KM barriers for lean transformation of IT R&D services organization and to design and validate interventions for the most important barriers.

In this chapter, I define the scope for the proposed research and state the research question. I also describe the selected research method and data collection methods, and the motives for selecting them.

2.1 Scope and research questions

Tieto Oyj was selected as target organization for the case study. The selected organization limits the scope of the study. Within Tieto, we have selected a specific organization, which offers software development services to customers in telecom area. Projects there are often distributed in multiple countries, such as Sweden, Finland, Poland or China. The organization is in the early phases of lean transformation. We aim to include multiple countries in the research.

In the research, we will concentrate on KM barriers directly related to lean transformation activities. This will exclude some common other types of barriers, and barriers, that affect KM outside lean adoption. The proposed interventions can only be described in detail after we have conducted further research on the barriers in the target organization.

For the proposed research, following research question is set: What knowledge management barriers there are for lean adoption in IT R&D services organization? Another research question will be defined later, after more knowledge is gained from the problem domain. It will address the validation of designed KM intervention.

2.2 Research method and expected results

The proposed research will be conducted using design science research methodology (DSRM) (Peffer, Tuunanen, Rothemberger, & Chatterjee 2007). The objective of the study is to create an artefact, which will serve a purpose from knowledge management point of view, in an organization adopting lean thinking. DSRM helps to structure the research in a logical way, and ultimately leads to answers to the proposed research questions. There are several different approaches to design science, but DSRM (Peffer et al. 2007) was selected because of its suitability for research in the field of information systems.

By adopting the design science research method a following pattern is followed: 1) Identify problem & motivate, 2) Define objectives of a solution, 3) Design & Development, 4) Demonstration, 5) Evaluation, 6) Communication (Peffer et al. 2007).

From the first phase, the output is the identification of the KM barriers in the target organization, which affect lean transformation. Phase 1 also improves the understanding of the problem domain in more detail and focuses further research. Additional research question is formed based on the results. In phase 2, we analyse the identified barriers and select the most important one(s). In 3rd phase, we design intervention(s) that are likely to address the identified and selected barriers. In 4th phase, we deploy the developed interventions in the target organization, and in phase 5, we evaluate the results we get by implementing the interventions. In the last phase, we publish the results in the master's thesis and communicate our findings inside the target organization as well.

The research will contain literature review of lean thinking in context of services and software development. It will also contain empirical case study. 3-4 teams from different countries will be selected a target groups. A global knowledge management framework (Pawlowski & Bick 2012) will be used for analysis of KM barriers, interventions and to study the relationship of lean transformation and knowledge management in a global context.

The outcome of the proposed research should be the validation of the proposed interventions and understanding of KM barriers for lean transformation. This information should be useful for organizations that are doing or are planning to adopt lean thinking. It will also provide information that can benefit the research of knowledge management and lean in IT service industry.

2.3 Data collection methods

Through literature review, basic understanding about lean thinking and KM barriers is established. Articles related to lean, are searched with Google Scholar system. The most common books (Womack, Jones & Roos 1990, Womack & Jones 1996, Liker 2004), referenced by these articles, are used to gain knowledge from lean thinking. ACM and IEEE databases are used to search studies related

to KM, barriers, and lean in the context of information systems and software development.

To understand better the problems of the target organization, questionnaires about barriers and potential interventions are conducted for target groups. These include persons implementing and working with lean transformation in their own projects, programs or organizations. The questionnaires will be qualitative in nature. If necessary, limited interviews will be conducted to further analyze the situation.

After a new intervention has been designed, it will be demonstrated in the organization, within a single unit. The method for evaluation will depend on the designed intervention. It will be reflected against the barriers that were identified before, with the help of the people who were identifying the barriers.

3 Preliminary content

In the following chapter, I describe the preliminary table of contents for the proposed research. The content of most important topics is explained in sub-chapters.

3.1 Overview

The proposed research will have the following structure:

1. Introduction
2. KM barriers and lean thinking
 - a. Knowledge management and barriers
 - b. Lean thinking
 - c. Role of knowledge management in lean transformation
3. Empirical study
 - a. Research subject: Tieto Oyj
 - b. Research method and the course of research
4. Results from empirical study
 - a. KM barriers for lean transformation
 - b. Designed Interventions
 - c. Validation of interventions
5. Conclusions
 - a. Understanding KM barriers
 - b. Designing interventions
6. Summary
7. References
8. Appendixes

Introduction describes the background and introduces key concepts and the motivation for the research. The chapter after introduction reviews the litera-

ture. The following chapters describe the empirical study and the last textual chapter is the Summary, which summarizes the whole research and results.

3.2 Literature review

The single chapter concentrating on literature review focuses on lean thinking and knowledge management barriers and the relationship between KM and lean thinking. The manufacturing roots of lean (Womack, Jones & Roos 1990, Womack & Jones 1996, Liker 2004) as well as implementations in service and software development industry (Staats & Upton 2011, Liker & Morgan 2006, Ikonen 2011), will be covered. Research by Pirkkalainen (2012) is the basis for understanding KM barriers. Research by Dahlke (2008) provides a starting point for understanding the relationship between knowledge management and lean thinking. The purpose of this part is to form a base for understanding the empirical part of the research.

3.3 Empirical study

The empirical study will be based Pfeffer et al. (2007) design science research methodology, which will be explained in detail in Chapter 3. The target organization for the case study will be introduced in the same chapter, as well as the context for their lean transformation (Turecek, Smirak, Malik & Bohacek 2010, Prochazka 2012). The global knowledge management framework (Pawlowski & Bick 2012) will also be presented, as it will be used for analysis in Chapter 4. Chapter 4 introduces the results from the study and Chapter 5 conclusions.

4 Schedule

In this chapter, I describe the planned schedule for the proposed research. The work began in February 2012, and it will be ready by the end of July 2012.

4.1 Literature review and DSRM phases

Following is the estimated time span for different phases of the research:

- Literature review: 1.2.2012 – 15.4.2012
- Phase 1: 15.2.2012 – 15.3.2012
- Phase 2: 20.3.2012
- Phase 3: 20.3.2012 – 30.4.2012
- Phase 4: May 2012
- Phase 5: May – June 2012
- Phase 6: June – July 2012.

The documentation of the research process happens during the phases, but for the last phase, time has been reserved for finishing the actual writing of the thesis.

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