

Improving the Problem Management Process from Knowledge Management Perspective

Marko Jäntti, Aki Miettinen, Niko Pylkkänen, and Tommi Kainulainen

University of Kuopio, Department of Computer Science,
P.O Box 1627, 70211, Kuopio, Finland
`mjantti@cs.uku.fi`

Abstract. IT organizations are continuously looking for systematic methods to manage IT services. Combining IT service management processes and knowledge management processes is an interesting topic because knowledge management will be included in the next release of IT Infrastructure Library (ITIL). In this paper, we focus on examining how knowledge management can be used to support the improvement of the ITIL-based problem management process. The research question in this paper is: how to improve the software problem management process by using a knowledge management framework. We use a case study research method to examine how an IT service provider identifies, creates, stores, shares and uses the knowledge of software problems. The main contribution of this paper is to provide a list of process improvement ideas collected during a knowledge management study in the case organization: TietoEnator Energy, Finland.

1 Introduction

The software problem management process is focused on collecting information on problems in IT products and services, identifying defects related to problems, removing defects and preventing problems and defects before they occur. Problem management is one of the key subprocesses within a service support and maintenance process [1]. In ISO 20000 Service Management standard [2], that is fully aligned with IT Infrastructure Library (ITIL) [3], problem management belongs to resolution processes that also include incident management and change management [4]. In CoBIT framework [5], problem management is categorized into Delivery and Support processes (DS10). Problem management is responsible for both resolving already reported problems but also preventing problems before they occur.

Problem management can be understood as “defect management performed by the service desk”. In the ITIL, problem management is divided into problem control and error control activities. Problem control aims to identify the root cause of the problem and define a temporary or permanent solution to the problem. In this study, we define a problem as “any difficulty that a user or a customer encounters while using the software product or an IT service”. If the root cause of a problem is a software fault (a defect), the problem will be escalated

to the error control activity that is similar to the defect management process [6], [7], [8]. Hence, traditional defect management methods such as defect causal analysis [9], defect profiles [10], and defect estimation models [11] can be used to support the problem management activities. Additionally, traditional defect management metrics (defect density, defect removal rate) [12] are still useful for problem managers.

Knowledge Management in turn is focused on generating, representing, storing, transferring, transforming, applying, embedding and protecting organizational knowledge [13]. There are various frameworks and approaches available for organizations who are planning to implement a knowledge management process: Knowledge management framework of CEN (European Committee for Standardization) [14], DISER (Design and implementation of Software Engineering Repositories) [15], CRISP-DM (Cross Industry Standard Process for Data Mining) [16], and Knowledge Value Chain model [17]. In this paper we focus on CEN framework that consists of five core knowledge activities: identify, create, store, share and use knowledge.

1.1 Our Contribution

The purpose of the knowledge management is to create and apply the knowledge about products and services, customers and technology. In this study, we focus our research on exploring how the knowledge about software problems is identified, created, stored, shared and used in our case organization. Previous studies have discussed problem management from the viewpoint of software maintenance [18], [19].

This study is a part of the work of an ongoing research project SOSE (Service Oriented Software Engineering) at the University of Kuopio, Finland. SOSE project aims to research methods for improving the quality of IT services. This study continues the work of our previous studies where we identified difficulties regarding defect management and presented a list of challenges in the problem management processes.

The main contribution of this paper is to provide IT organizations with information how knowledge management models and IT service management processes can be combined to improve the quality of the service support processes. The research question in this paper is: how to improve the software problem management process by using a knowledge management framework. The Lessons Learned list with process improvement suggestions is based on the case study with one case organization: a large IT service provider.

The rest of the paper is organized as follows. In Section 2 we describe the research method of this study. In Section 3, main findings from the case study are presented. Section 4 is the analysis of findings. The discussion and the conclusions are given in Section 5.

2 Research Methods

This paper focuses on examining software problem management from knowledge management perspective. The research question in this paper is: how to improve