Chapter 11
Knowledge Management and Software Development Organization: What Is the Challenge?

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ABSTRACT
Software development organization (SDO) is a kind of knowledge-intensive business and their large majority is small and medium enterprise (SME) facing similar challenges of large ones. The diversity and complexity of the SDO environment makes knowledge the fundamental element in the software development process, which strengthens the importance of an effective knowledge management process. The software development process involves multidisciplinary teams, and the various working meetings that occur during a project are conducive to generate and share a lot of knowledge, in particular tacit knowledge. The use of a knowledge management process that enables to manage tacit knowledge will define the difference between a good SDO performance and the best SDO performance. This chapter aims to present an exploratory study based on literature review, with the aim of identifying the main challenge of knowledge management in the SDO context. The authors also aim to address some new research directions.

INTRODUCTION
As a knowledge-intensive organization, the most valuable asset of a software development organization (SDO) is the knowledge of its employees (Lee-Kelley, Blackman, & Hurst, 2007; Walz, Elam, & Curtis, 1993). Consequently, knowledge management assumes a vital role in the software development process of any SDO.

Knowledge has become one of the most valuable resources for businesses, representing an important driver of strategic capability and competitive advantage (Johannessen, Olsen, & Olaisen, 1999; Kasemsap, 2015). Nahapiet and Ghoshal (1998) added that the advantage obtained by the organizations depends largely on the ability of creating and sharing knowledge.

According to the classical division introduced by the Hungarian chemist and philosopher Polanyi (1966) and widely spread by Nonaka et al. (1996), knowledge can be explicit or tacit.

Explicit knowledge is a type of knowledge that can be easily codified, articulated, documented and archived. While tacit knowledge although being at the base of the creation of the knowledge, is complex, it is not easy to be codified, and presents some difficulty in its reproduction in a document or in a database.

Knowledge management is the process that enables the sharing, capture and application of knowledge from the individual to the group and further to organizational level (Rasmussen & Nielsen, 2011). The current SDO environment is characterized by increased diversity and complexity in software development projects. Due to this environment, software development process involves multidisciplinary teams (Huzita et al., 2012) once a member of a team no longer has all the necessary knowledge (Desouza, 2003; Walz et al., 1993). The several working meetings that occur throughout a project are conducive to generate and share a lot of tacit knowledge.

But in the meantime, despite the importance of tacit knowledge generated in the software development process, several authors (e.g., Huzita et al., 2012; Johnson & Donnelly, 2013) pointed to the fact that due to lack of proper mechanisms that allow sharing, identification and capture of this type of knowledge, most of them is wasted resulting in unavailability for future uses or projects (Johnson & Donnelly, 2013).

However, what is the challenge of the knowledge management in SDO?

According to some authors, it is possible to suggest that the main challenge of the SDO is developing mechanisms to make the tacit knowledge more explicit as possible (Johnson & Donnelly, 2013; Shull et al., 2002).

Through a literature review on the knowledge management in SDO, the purpose of this chapter is to present an exploratory study that describes the main findings that may respond to the aforementioned question. The chapter also aims to address some further research directions.

This chapter is organized as follows. In the next section, the authors briefly introduce SDO and knowledge management. The following section, based on the literature reviewed, provides a critical discussion of the knowledge management in software development environment. Following this section, the authors discuss about the main challenges of knowledge management in the SDO context. Finally, in the remainder sections, the authors point future research directions, and conclude.

BACKGROUND: THEORETICAL FOUNDATIONS ON SOFTWARE DEVELOPMENT ORGANIZATION AND KNOWLEDGE MANAGEMENT

In this section, the chapter outlines a brief theoretical foundation of the study. The first part covers the SDO. The second part discusses knowledge management and its processes.

Software Development Organization

SDO is a kind of business typically based on knowledge-intensive activity (Aurum, Daneshgar, & Ward, 2008; Lee-Kelley et al., 2007; Mehta, Hall, & Byrd, 2014; Walz et al., 1993) where knowledge is the
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