ABSTRACT

Knowledge assets are knowledge regarding markets, products, technologies and organizations, that a business needs to own and that enable its business processes to generate profits. Today, how to model knowledge assets is a concern of the organizational modeling community; mostly because consensus on a knowledge asset model is far from achieved. This chapter is aiming at identifying a model to characterize knowledgeable assets and their relationships in a software organization. Generally speaking, knowledge assets represent intellectual capital for a software organization and support the whole organizational process. The model proposed here is an initial step towards defining knowledge management as a transversal process at the organization. An instantiation of the model is illustrated through a case study in a real software company that recognizes the value of knowledge as a tool to support and improve the organizational strategies.
INTRODUCTION

The term “software process improvement” (SPI) groups all those activities aiming at improving processes in software organizations. SPI models, such as capability maturity model integration, or CMMI (Chissis, Konrad, & Shrum, 2005), and MoProSoft (Oktaba et al., 2003), offer a general guide about the goals and best practices that should be adopted by the organization in order to define a standard, controlled, and monitored process. For this purpose, many research lines around software processes have emerged.

Metaprocesses have been used to study the particular characteristics of the software process and to express the relevant questions to be asked at a conceptual level (Nguyen & Conradi, 1994; Ruiz, García, Piattini, & Polo, 2002; Senge, 1990). For example, the SPEM (Software Process Engineering Metamodel) is a specification defined by the OMG that describes a concrete software development process or a family of related software development processes (Senge, 1990). Additionally, several research efforts have investigated on how to describe software processes precisely by using knowledge representation techniques and process-centred software engineering environments (PSEEs) (Dingsøyr, 2003; Dingsøyr & Røyrvik, 2003; Liao, Qu, & Leung, 2005). They add logic rules to the processes so as to provide appropriate management of information. But most of the existing PSEEs only focus on the life cycle models oriented to the development processes and omit software process models. There are also some SPI tools that can help improve the processes by providing many functions, such as document management. However, the usage of these tools and environments is limited, due to their lack of flexibility, so their reusability and extensibility are limited.

To develop software is an example of “knowledge work” proposed by Peter Drucker (1993) because the software process engineering’s “value is (...) created by ‘productivity’ and ‘innovation.”” One of the latest tendencies to improve the software process is knowledge management, a field that provides concepts and tools to manage organizational knowledge (Ruiz et al., 2002; Scharmer, 1996), and it is also related to creating “learning organizations” in software engineering: “learning software organizations” (Dingsøyr, 2003). Knowledge is defined by Davenport and Prusak (1998) as:

\[ \text{a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often become embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms.} \]

Knowledge can be tacit or explicit and may embody high-level company policies; a customer sets the way of doing business or even know-how about technical methods such as standard design methods. Tacit knowledge refers to that knowledge that is embedded in individual experience and includes insights, perceptions, intuition, and skills that are highly personal and hard to formalize, making them difficult to communicate or share with others. Explicit knowledge is knowledge that has been articulated in formal language and can easily be transmitted among individuals. All those can be assets that share a common intent; they are meant to support organizational processes.

Another new approach is organizational learning, a field of study of the organization and representations of experiences have been defined in such a way that learning can be retrieved and used for solving a new problem (Brown & Duguid, 1991; Scharmer, 2001). A learning organization is “an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insight” (Garvin, 1993). This approach funds on designing rationale of systems (Concklin, & Begeman, 1988;
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