Chapter 14
Enabling IT Innovation through Soft Systems Engineering

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ABSTRACT

In any Software Development process, and especially in innovation processes, the team responsible for software implementation needs to acquire the necessary knowledge to implement the project and to sustain innovation. However, the implementation team does not always convert innovative ideas into the expected value. The Software Development Process has a complexity that is process-inherent. Soft System Engineering is a response to address this complexity and to support the application of user-driven methods in an open innovation environment. This approach allows the development of a systematic interaction with users to generate new offerings and to improve previous products and services in order to create value and differentiation.

INTRODUCTION

The actors involved in Information Technology (IT) innovation activities are not only software developers. Users of products and services are increasingly present in the IT innovation process. IT innovation is generated by a combination of competencies, which promote advancement of business, society, and wellbeing. The term 'users' refers to individual end users, consumers, and social organizations that have an interest in the Software System.

Innovation in IT is motivated by the demand for efficiency and performance; a demand motivated by the XXI century economic scenario. David and Forey (2002) argued that innovation is becoming the sole means to survive and prosper in highly competitive and globalized economies.

IT professionals suffer pressure to innovate, and, besides innovation possibilities being countless, these professionals must not forget that innovation depends on the correct understanding of user needs. Although it might seem easy, the activity of understanding user needs, and prob-

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lematic situations demanding a solution, must be performed carefully; as stated by Brooks (1987), the hardest single phase of building a Software System is the activity of understanding the problem to be solved. Another issue that brings complexity to this environment is that there are several companies that do not have Software Development (SD) as its core business, despite having some kind of IT department. And, as argued by Govindarajan and Trimble (2010) for companies in general, the IT department of these companies is not built for innovation; they are built to be efficient. Furthermore, they must deal with day-by-day demands and business pressures to reduce costs and the delivery time of their on-going activities.

Most companies have IT professionals with creativity and the necessary technological knowledge to implement an innovative idea. However, the presence of good professionals is not sufficient. It is necessary to manage this people in a way that stimulates and motivates the combination of different IT disciplines and individual perspectives. The management challenge is how to go beyond the traditional SD processes to convert individuals' capacities into an IT Teamwork, in which its members work together to build up the understanding of what is being demanded by users. Likewise, this management process must also consider the on-going activities and build an environment in which innovative ideas about SD can emerge, to deliver efficiency and innovation in IT processes, and to support the company innovation process (Tidd & Bessant 2009; Govindarajan & Trimble 2010; Ries 2011).

This chapter is about Soft System Engineering in IT innovation, with focus in a process that is user-driven. It is an approach to interact with users in a systematic way to generate new offerings, and to improve IT previous products and services, in order to create value, differentiation and to contribute to organizational efficiency and performance. The success of this approach also depends on Teamwork management; a management focused on the Socio-technical System formed by Teamwork members, users and the Information and Communication Technology (ICT) used to support Teamwork practices of user-driven innovation in an open innovation environment.

TEAMWORK

Tidd and Bessant (2009) state that the growing complexity of tasks in organizations is surpassing the cognitive capabilities of individuals and, consequently, asking for a team approach. In Teamwork, people are interdependent and interact with each other, teaming up to share information and to achieve common goals.

IT professionals usually use ICT to interact. Nowadays, ICT progress creates an environment in which even when IT Teamwork shares the same physical space, team members use technology to interact with each other. When an IT department has professionals that belong to the Digital Age generation – the generation that was born and grew up using computers, and is fascinated by new technologies – the use of ICT reaches levels of greater significance.

People interaction mediated by ICT brings challenges to the management of SD, especially because the technologies that are currently available do not recreate human work experience as it occurs in physical spaces, which encourage cooperative work, and also because there are open issues about privacy (Bencivenga 1998; Birnholtz, Gutwin, & Hawkey, 2007). However, ICT is useful and necessary when there are Teamwork members that are not in the same physical space at the same time, or in SD processes in which there are people who will never meet other members of the Team in person.

Every SD methodology–be it Agile, Prototyping, Unified Process, or any other method–has activities that are always present, such as Teamwork management and the management of the knowledge that is acquired through the interaction among IT Teamwork members, and between these