

Chapter 110

The Role of Feedback in Software Process Assessment

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ABSTRACT

Processes encapsulate the way organizations are doing business. However, in many cases organization processes are not well defined, which leads to poor and unsystematic implementation. An organization that uses weak or misdirected processes will have weak products or services, and unpredictable outcomes of business activities. Process assessment can help software organizations to improve themselves through identification of critical problems and establishment of improvement priorities. Software process assessment includes feedback as a core activity that aims at feeding data back to relevant individuals or groups in an organization. Feedback is also used as a method for learning in software organizations based on the previous experience and identified issues in the assessment process. In addition, information included in the feedback can be used as the basis for decision making related to revealing the next activities in assessment and improvement project.

INTRODUCTION

Processes play a pivotal role in business success of enterprises because effective processes increase their adaptability, efficiency and competitiveness in a global market (Lam, 2014). Lepmets et al. (2012) argued that effective software organizations should align their processes to overall business goals and goals on the operational level, which assumes continuous process assessment and improvement. However, in many cases processes are not well defined, which lead to poor and unsystematic implementation. According to Persse (2006), an organization that uses weak or misdirected processes will have weak products and services, and unpredictable outcomes of business activities. For solving problems with poorly defined and implemented processes, a number of approaches have been proposed and shaped in software process improvement (SPI) frameworks. SPI is a set of activities aimed at achieving better process performance,

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leading to increased quality of software products and services. However, analysis of reported SPI studies revealed a great variability in success of SPI initiatives (Rainer & Hall, 2003; Montoni & da Rocha, 2014). In addition, Bannerman (2008) argued that implementation of SPI initiatives does not always lead to business benefits.

Process assessment helps software organizations to improve themselves through identification of critical problems and appropriate improvement opportunities. Process assessment is the first phase in SPI cycle, which means that assessment outcomes serve as input for process improvement action plans. Effective assessment requires commitment and involvement of management at all levels in an organization, as well as involvement of staff who implement processes (Mathiassen et al., 2005; Herranz et al., 2013). According to Baddoo et al. (2000), a variety of experiences and attitudes of different groups of people within an organization positively contribute to realization of process assessment and improvement activities. O'Connor & Basri (2012) stated that people involvement in assessment and improvement activities is necessary because employees are the best source of information for these activities and should implement improvements in practice.

Feedback is one of the most valuable tools for achieving continuous organizational development and improvement (Roebuck, 1996). Feedback is essential in assessing and improving organization performance since it is in the core of problem solving activities and it influences decision making while searching for solutions for identified problems (Greve, 2010). Understanding feedback and its effects requires looking at intrinsic sources of information relevant for increasing knowledge and improving performance of individuals and organizations (Greller & Herold, 1975). Considering people as the main sources of feedback information in an organization positively influences the success of improvement initiatives. However, it is necessary to consider and weight potential sources of information, which is usually the task of people within an organization.

Software process assessment includes feedback as a core activity aimed at feeding data back to relevant individuals or groups within an organization. Feedback is usually a part of a typical sequence of activities, which includes collecting, analyzing and interpreting data. Dyba et al. (2004) proposed a measurement and feedback process in the context of software process assessment with the following steps: planning to use data, collecting data, analyzing data, feeding back data, and follow up. Feedback is also used as a method for learning in software organizations based on previous experiences. Heikkilä (2009) suggested that SPI initiatives should be more concerned with organizational learning and change management, which helps in improving processes gradually and based on lessons learned during SPI implementation. In addition, information included in feedback can be used as a basis for decision making. According to Halloran (1999), software process assessment and improvement facilitate organizational learning if all relevant information and knowledge is communicated to organisation's members.

BACKGROUND

The concept of feedback has been researched and used in many different fields, including education, management, marketing, professional training, human resource development, medicine and engineering. Feedback is a complex concept originated in systems thinking and cybernetics. Due to the specificity of different fields, the term feedback has been used and interpreted in many ways, which causes that there is no universally accepted definition of feedback in theory and practice. Ramaprasad (1983) provided the most general definition of feedback: *Feedback is information about the gap between the actual level and*

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