Learning and Organizational Change in SPI Initiatives

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Abstract. Explaining how organizations change has been a central and enduring quest of management scholars and many other disciplines. In order to be successful change requires not only a new process or technology but also the engagement and participation of the people involved. In this vein the change process results in new behavior and is routinized in practical daily business life of the company. Change management provides a framework for managing the human side of these changes. In this article we present a literature review on the change management in the context of Software Process Improvement. The traditional view of learning, as a “lessons learned” or post-mortem reporting activity is often apparent in SPI literature. However, learning can also be viewed as a continuous change process where specific learning cycle starts with creative conflict and ends up in formal norms and systems. Since this perspective has almost no visibility in SPI literature of past it could show a new direction to the future development of change management in SPI.

Keywords: Organizational change, learning, SPI.

1 Introduction

Many software firms see Software Process Improvement (SPI) as a strategic matter and are involved in organizational change initiatives to improve their software development practices. The fundamental goal of the SPI is improvement - for instance in software quality and reliability, employee and customer satisfaction, and profitability - by changing the organizational practices of firms [1]. Various maturity models can steer SPI initiatives since they offer different options for assessment and improvement, but successful SPI requires effective change management irrespective of the model adopted [2]. The challenge is that software developers must continue working productively while process changes are being implemented. Process improvement requires organizational and behavioral changes - changes in the way people communicate and collaborate as they do their work. Bringing about such changes requires management: a proven strategy, careful planning, flexibility and creativity in executing plans, and insight into issues surrounding organizational change. Thus organizational change management can be described as a process where structured approaches and tools are applied within organizations to enable its transition from a current state to a desired future state.

The literature on the change management field comes from psychology and organizational science. There are a multitude of approaches on change management and it
is rather difficult to point out a common denominator. But obviously there is a tight connection with the concept of learning organizations [3,1]. In the context of SPI, change is the result from an organizational learning process that centers on the topic of SPI initiatives. Only if organizations and individuals within organizations learn, they will be able to master a positive change.

In this paper we combine literature on organizational learning and management to understand learning and change in organizational settings. We then apply these theories in analysis of SPI models, particularly CMM(I), SPICE and IDEAL. Thus we aim at better understanding of organizational learning in SPI context. Our contributions are consequently twofold. First, we review different theoretical perspectives on learning. Second, we utilize the literature to analyze SPI models to make suggestions how learning can be supported, encouraged and facilitated.

The paper is organized as follows. First, as theoretical background, literature on learning in organizations and change management is reviewed. Second, the recommendations and findings from the above mentioned literature are applied in the analysis of SPI models. The article ends with conclusions suggesting some amendments to current SPI models promoting, in a coordinated manner, the innovativeness and capabilities of the personnel.

2 Learning Organizations

Argyris and Schön [4] introduced a conceptualization of organizational learning. They identified three levels of ‘learning loop’ within an organization: single-loop learning is a simple behaviour adjustment in a mismatch or error situation, respecting the organization’s current principles and rules. At a higher level, i.e. double-loop learning, the organization questions and modifies existing rules and procedures in response to mismatch or error. In other words, the organization tries to make sense of what is going on and what assumptions should be changed in order to achieve better results. The highest organizational learning loop is deutero-learning. This loop refers to the organizational problem solving capacity and capability to redesign policies, structures and techniques in the situation of constantly changing assumptions about the self and the environment. Deutero learning means understanding single-loop and double-loop learning in order to increment them. Thus the challenge for an organization – or network of organizations – is to provide its members with the necessary conditions for developing its capacity to assimilate knowledge and to solve problems [5] between the network partners [6,7].

Gattermann & Hoffmann [8] suggest that the success of deutero learning and the restructuring of values and rules can be assessed by the level of acceptance of change within organizations. Evidently, in order for that to take place, not only individuals but also organizations and networks must be provided with the conditions necessary for learning. Indeed, knowledge management literature suggests a variety of models and methods for knowledge creation and sharing through interaction (tacit knowledge) or through documents and information systems (explicit knowledge).

In line with the view of the firm as a ‘sense-making system’ [9,10] Nooteboom [11] explains the need for shared insights and models by pointing out that information