Software Development Improvement with SFIM

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Abstract. Most industries are challenging to increase productivity of software development. Often many process improvement activities are started with enthusiasm, unfortunately most of these are less successful than forecasted or improvements do not sustain for long. This paper presents the Seven Forces Improvement Method, SFIM, which claims to overcome unexpected disappointment in improvement results. SFIM is built upon different aspects that influence the success of software process improvements, such as culture, skills and organization. The method has been applied to improvement activities in a large software department for a number of years. The success of SFIM is compared with the compliance with the SFIM method. The paper shows that application of SFIM increases the success rate of software improvement activities in industry.

Keywords: Software Process Improvement, 7S model, Force Field Analysis, CMMI.

1 Introduction

Healthy organizations are continuously looking for ways to better serve the customer and improve their business in a never-ending cycle. Good is never good enough and what is good today may become unacceptable tomorrow because of the ever changing environment in which each organization operates. New technologies, merges with other companies, changing customer demands, employees with fresh ideas, there are numerous triggers for changing.

During more than a decade, most organizations use the Capability Maturity Model (CMM) [Hum89] to control and measure software improvements. CMM provides a framework consisting of Key Process Areas (KPA's) with a kind of recipe in which order the KPA's have to be developed. For some reason this model does not work properly in each organization. CMM mainly focuses on process, while other aspects play a role as well, e.g. the factors that play a role during realization. When changing an organization to establish an improvement, many more factors are influencing the success. In general, it takes a lot of effort and energy of many people to achieve a change.

A feeling of discomfort is rising in the software world. Only with great effort and difficulty organizations move towards higher maturity levels. Most of them never

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reach higher levels or when achieving a high level they have a large probability to fall back to a lower level. After 15 years of CMM only 18% of the organizations that report there CMM statuses to the SEI are at CMM level 4 or 5 [PMF05]. On the other hand, organizations at CMM level 5 still suffer problems that one might not expect at that maturity level such as projects that are still running late or providing unexpected results. The main objective of this paper is to provide means to realize sustainable software process improvements in an organization without restricting this to the domain of software process only. Here, we will answer the following questions:

- Why do software process improvements often not sustain in an organization?
- Why are these improvements slowly (or not at all) progressing in an organization?
- What are the influencing factors in software process improvements?

In section 2, we discuss various change management models to improve an organization. Two of the most influencing models, CMMI [CKS06] and 7S [PW82, PA81, WP80], are compared with each other in section 3. In section 4, we introduce the SFIM method, which encompasses good elements of multiple change management models. In section 5, we discuss SFIM in the context of an industrial case at Philips. In section 6, we discuss related work. Conclusions are drawn in section 7 including some suggestions for future work.

2 Change Management Models

In this section, we will discuss organizational models, which support a change in an organization. A lot of models have been published and still new models are developed in research and they are applied in industry [VBM06, SPI05, HHSE03]. Some models contain multiple viewpoints to address the organizational change. We will discuss a few of them: MOON [WW02] addresses cultural and human aspects, EFQM [HHH96] addresses quality in a full product lifecycle, CMMI [CKS06] identifies various process areas, the BAPO model [HKN+05] addresses four viewpoints, TOP is an integral development model [RHH06] and the 7S model [PW82] addresses seven points of view. The scope of operation of the above models ranges from culture to humans, from architecture to process and from skills to quality. We will shortly discuss these models.

Associates for corporate change developed the MOON-scan [WW02]. (MOON is a Dutch acronym, which means "Model Organizational Development Level"). MOON classifies the development of an organization into four increasing levels: *'reactive'*, *'active'*, *'proactive'* and *'top-performance'*. The model provides actions based upon human and cultural elements to move to a higher level. This model typically addresses the softer aspects of organizational improvement. MOON is applied in some (Dutch) industry, however not widely known. Interesting is that culture is one of the most important views in this model.

At the end of the eighties, the European Foundation for Quality Management developed the EFQM model as a joint activity of 14 European organizations [HHH96]. The EFQM model explicitly covers the 'soft' aspects of improvements such as leadership, strategy, policy and people management and sees them as important enablers for quality management in the whole product lifecycle. EFQM is