In Pursuit of Continuous Improvement:  
The Case of a Software Company

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ABSTRACT

Companies focus on software development in order to survive in a highly competitive world. They not only need to keep up to date with the changes that are occurring in their environment, but they also need to assure the effectiveness of their processes. One way to do that is pursuing high quality standards by continuously improving the development processes. This article describes the decision of a software company specialized in information technology services for banking to pursue the improvement of its software development processes through CMMI ML3 certification and LEAN implementation. Throughout the article is shown the reasons why it was decided to take this enhancement step, the tools used to support the implementation, and the obtained results. The intent is to show that continuous improvement is not an immediate result of a certification or best practices implementation but the decision to make improvement as company’s DNA.

KEYWORDS

Case Study, CMMI, Continuous Improvement, Implementation, LEAN, Maturity Model, Productivity, Software Development, Software Engineering

INTRODUCTION

The current need for productivity and quality improvement leads to constant search for continuous improvement and effectiveness of how these continuous improvement methodologies are implemented makes up the key to the success of an organization (Salah et al., 2010).

Taking as starting point the fact that companies have prioritized productivity gains / efficiency in its operations, resulting from the intensification of competitiveness, it is seen that continuous improvement takes up significant space in business management.

Continuous improvement is characterized by promoting, through group activities, small improvements in products and processes, which may, at that time, not be enough to face the new challenges by companies. As an evolving concept, the improvement tends to continuous innovation, which proposes more radical changes by introducing new technologies and the incorporation of new procedures, methods, administrative structures and processes to current standards companies (Prajogo & Sohal, 2001; Nilsson-Witell et al., 2005; Upton, 1998).

Performance measurement can help the process of continuous improvement of the organization and can help detect: what is happening with the company’s performance; which likely reasons that makes up the current situation; and which may prove to be the actions to be taken (Ghalayini & Noble, 1996; Kaplan & Norton, 1996; Hronec, 1994; Neely, 1998; Bond, 1999).
They tell people what they are doing, how they are doing and if they are acting as part of the whole. They communicate what is important to the entire organization: the first echelon of management’s strategy to other levels, results of processes, and control and improvement within the process (Hronec 1994).

With this thought of continuous improvement in mind, NBSI (Novo Banco Sistemas de Informação), a software company specialized in information technology services for banking, after implementing CMMI ML2 (Capability Maturity Model Integration Maturity Level 2) processes (Liberato et al., 2015), decided to continue pursuing the improvement of its software development processes through CMMI ML3 implementation and to expunge the efficiency and productivity issues found through LEAN implementation.

This chapter aims to describe the approaches taken in both continuous improvement implementation projects and tools to support them and also the mechanisms to manage and measure it. Besides that is also analyzed and discussed the results of this dual implementation, by analyzing not only the official compiled data results analysis provided by the organization, but also the response of 22 (twenty two) team managers to a survey where it was asked their opinions on the added value of those initiatives for the day by day work and management of their teams and projects.

SOFTWARE ENGINEERING CONTINUOUS IMPROVEMENT

Software Process Improvement (SPI) is the modification of current software process methods in many software development organizations. Its aim is to improve the organization’s ability to produce better software products (Humphrey, 1990).

Competition has become more and more fierce, customers are demanding higher quality at lower prices and profit margins seem to be falling especially in times of crisis. An efficient and effective strategy to become more competitive is to adopt continuous improvement methodologies. Quality is more than making things without errors. It is about making a product or service meet the individual perception of a customer about the quality or value. (Dumitrescu & Dumitrache, 2011)

The measure of performance is a question in which all companies are involved. The performance monitoring has the goal to improve the ability for the control process of the results of a company. There must be clear objectives, indicators, operational plans, and then the measure of the performance achieved. Often, the common meaning of performance is confused with the efficiency of direct labor, which tends to take marginal importance compared with the other inputs, such as non-quality costs, productivity, material, indirect labour and capital invested in stocks and assets. A monitoring system is necessary to measure the achievement of targets and the deviation from the objectives; the instrument will be more effective and accurate if it can track the individual contributors that affect directly and indirectly these objectives. The difficulties of setting up a system of performance measurement are not few. For example, an initial problem is to determine the period of controlling and planning. If the time periods are too long, the connection between goals and daily actions may be lost. If the time periods are too short, the necessary freedom of action may be lost. The main characteristics of the system to pursue what planned are the following: a dynamic and flexible system; to be able to monitor in real-time the performance; to detect the contributors which adversely affect performance; to show the trend of the individual contributors; furthermore, based on these elements, the system has the possibility to trigger a system of continuous improvement (Romaniello et al, 2011).

The understanding and development of continuous improvement can be achieved through a gradual process of Organizational Learning, which can be summarized in the following steps:
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