

Square model is better than Spiral Model to improve the process of IVR Software

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Abstract. Software process improvement (SPI) has emerged as the dominant approach for improving quality and productivity in software development organizations. It is an important activity which starts when an organization plans to enhance/purify the capabilities of its on-going processes. When improvement or change is planned or initiated, there are a number of process-improvement-factors which originate and affect the effectiveness of software process improvement. Therefore the biggest challenge is to find a route for appropriate SPI technologies to realize their company's improvement goals. A software Industry focused on two different research fields work on the issues of software process: first - software process modeling and second - software process evaluation and improvement. In this paper, the most relevant results of second approaches are presented to evaluate the process improvement for development of IVR software using Square Model. This paper also suggests to IVR application software companies that require collaboration and strengthening to transform their current perspective into inseparable global IT scenario.

Keywords: Interactive Voice Response (IVR), Voice Response Software (VRS), Line of code (LOC), Computer Telephony Integration (CTI), Business Process Outsourcing (BPO).

1. Introduction

Currently Process Improvement is widely used in software industry. This activity starts when the deficiencies are identified in the current processes and finished when a certain satisfactory or defined level is attained. It is being used in order to improve the quality, productivity and organizational on-going processes [1]. Currently, most of the organizations have limited resources everywhere in the world. If full resources and complete process may use then quality of the product can better improved in order to exist in the market with the passage of time [2]. SPI involves the understanding of the software processes as they are used within an organization and suggests areas for improvements in achieving specific goals such as increasing product quality, operation efficiency and cost reduction [3, 8]. A process is known to be mature if they pass at least five levels. These five levels of process maturity are [5]: 1. Initial - until the process is under statistical control, no orderly progress in process improvement is possible. 2. Repeatable - a stable process with a repeatable level of statistical control is achieved by initiating rigorous project management of commitments, cost, schedule, and change. 3. Defined - definition of the process is necessary to assure consistent implementation and to provide a basis for better understanding of the process. At this point, it is probable that advanced technology can be usefully introduced. 4. Managed - following the defined process, it is possible to initiate process measurements. This is where the most significant quality improvements begin to appear. 5. Optimized - with a measured process, the foundation is in place for continuing improvement and optimization of the process. The most popular reasons for introducing SPI are - improving software quality due to best-practices; reducing costs; and reducing timescales. It is fact that the use of best-practices in a software project development improves productivity in organizations, projects planning and the quality of the software products. Currently, they are deployed because of the broad usability of project management tools. However they present several constraints to manage and transfer the knowledge of these best practices. The knowledge is obtained through the software engineering experts' experiences. Based on the use of best - practices and knowledge management with the help of square model the process of IVR software may be improved better than use of spiral model. Currently the IVR software is in huge demand by BPO industries to make inbound -outbound calls among the customers and product information. This is based on Gensys technology and IVR technology. In this paper we use the square process model for better improvement of IVR software [7]. The main capabilities of this square model are: to reuse and manage of process assets; to

improve the efficiency of use of the processes; to reduce costs in software process improvement programs; to work collaboratively in the phases of software projects. It has been observed that while developing the IVR software the iterative and prototype software model are being followed with risk management. The components are being tested through manual testing and testing by tools but the interactive voice testing are not tested at each component level. Therefore it is advisable to test the interactive voice testing at each component level to avoid the fault and failures during development of IVR application by square model.

2. Existing Models

The purpose of this research work is to give a very brief introduction to some of the most commonly recognized SPI models like SPICE, SW-CMM, CMMI, ISO 9000 - 9001, Trillium, BOOTSTRAP and Six Sigma. Based on the results of preliminary study on the literature, several studies related to frameworks for measurement and evaluations of SPI were identified. The studies are briefly discussed in the paragraphs below.

A. Capability Maturity Model

The process was developed by the Software Engineering Institute at Carnegie Mellon University in 1986. The Capability Maturity Model for Software is a model for judging the maturity of the software processes of an organization and for identifying the key practices that are required to increase the maturity of these processes. Problems typically reported with the CCM when used by these organizations were: Documentation overload, Unrelated management structure, High resource requirements, High training costs, Lack of need guidance, Unrelated practices. The SW-CMM has been developed by the software community with stewardship by the SEI [14].

B. Capability Maturity Model Integrated CMMI-SW

Capability Maturity Model Integrated for Software builds on and extends the best practices of the Capability Maturity Model for Software [5]. CMMI is based on the SW-CMM and could be considered as version 2.0 of the SW-CMM. While some new information has been added in this version of the CMM, most of the old information have been reused -simplified and extended.

C. SPICE

SPICE stands for Software Process Improvement and Capability Determination. It provides a reference model for focused self-assessments and includes a capability scale that is simple to understand. The main objective of SPICE is to provide a framework for the assessment of software processes and to decide if the performance of the process/processes is satisfying and if the processes are effective in achieving their goals, and to distinguish and determine the capability of the process [29]. The result of the assessment is analyzed to determine the weaknesses, strengths and risks of the process. This can be used as a base for process improvement. The definition of the term "process assessment" is "A disciplined evaluation of an organization's software processes against the process model or variant model described in this International Standard.

D. Bootstrap

Bootstrap is a methodology that originated in a European Community project that took place between 1991 and 1993. The project consisted of developing the Bootstrap model and stage 60 trials in the industry. Since the projects ended Bootstrap has been further developed. The main goal with the project was to speed up the application of software engineering technology in the European software industry. In a related article, Stienen described the main characteristics of the BOOTSTRAP method [30]. These included the reference framework, the assessment procedure, the structure of the questionnaires, and the rating and scoring mechanisms employed. The BOOTSTRAP method adopted a process model which addresses processes and practices for both the software producing unit and the project. Process areas were divided into organization, methodology, and technology.

E. Six Sigma

"ó" (sigma) is a Greek letter that stands for standards deviation – a measure of dispersion, variation or spread [6]. Six Sigma is a methodology for eliminating defects, waste, or quality control