How to Improve Process Models for Better ISO/IEC 15504 Process Assessment

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Abstract. Since the evolution of SPICE towards a generic standard for process assessment in 2003, there have been an increasing number of initiatives aiming to propose Process Reference Models (PRM) and Process Assessment Models (PAM) in various fields of activity. Although these process models are the basis of any process assessment, the related ISO/IEC 15504-2:2003 requirements are not very strict and can be variously interpreted. Enhancing these requirements would improve both the intrinsic quality of process models and their added-value from the user standpoint. The current revision of the standard is an opportunity to bring an answer to issues that were raised by the experienced developers and users of ISO/IEC 15504 compliant process models. This paper proposes parts of an answer to some of these issues and motivates them through their direct impact on the process model relevance from the beneficiaries’ point of view.

Keywords: process model, ISO/IEC 15504, process assessment, assessment indicators, goal tree, user’s standpoint.

1 Introduction

The activities related to process assessment are described in the ISO/IEC 15504 standard where the normative requirements have been grouped in the part 2 of this standard. Originally designed to support the assessment of software development processes, the 2003 version of the standard has opened up the way to other sectors of the industry as well as new horizons to process assessment. The most popular projects to extend the use of ISO/IEC 15504 to other sectors are probably Automotive SPICE, SPICE for Space and Enterprise SPICE. More recently, a new ISO initiative have been launch to develop process models for ISO/IEC 20000 standard [14].

Other projects, initiated locally, have studied the opportunity to develop or implement new PRMs and PAMs for IT security [1], IT service management [6] [21] [22], knowledge management [4], internal control [20] and even to industrial processes [3] and public university research laboratories [5].

Those projects were mainly aiming at building PRMs and PAMs (for later process assessment) based on various types of descriptions of processes, as it was for example
the case with the IT Service Management processes as documented by the British Office of Government Commerce (OGC).

Process assessment models (PAMs) are the foundation of any process assessment and their quality directly impacts the relevance of the process assessment results. Nevertheless few requirements are defined in ISO/IEC 15504-2 about the process models and no one can assure the accuracy of a process model according to the specificities and constraints of the expected context of use (domain, type of organization…). The ISO/IEC 15504 standard has recently entered a revision cycle. It will be replaced by a new series of standards: the ISO/IEC 33000 series. This revision is the opportunity to bring an answer to known issues.

After reminding what process models are and the related requirements from ISO/IEC 15504 standard, this paper presents the main issues with process models when used in assessment. Then, based on practical experience, some improvements are proposed to enhance the quality of process models and finally the impact on their use is discussed to motivate their integration into the new ISO/IEC 33000 series.

2 The Current State of Process Models

As the saying goes, “you can’t improve what you can’t measure”. It is particularly true when speaking about process. Whatever the field of activity (software development, incident management, or apple pie cooking …) the first step when trying to improve a process is to measure precisely its current effectiveness and its efficiency. A process assessment contributes to get this essential information through the determination of process capabilities.

In the field of process assessment, ISO/IEC 15504 [12] is the reference standard. It describes the concepts of assessment process, measurement framework for process capability, and process models. Even if they can have various purposes (capability determination, process improvement, benchmarking, or supplier selection) all process assessment projects have a common feature: they are founded on process models.

2.1 Definitions

To avoid any misunderstanding, some assessment-related terms have to be clarified. The ISO/IEC 15504 standard [11][13] defines these terms as following:

*Process Reference Model (PRM):* A model comprising definitions of processes in a life cycle described in terms of process purpose and outcomes, together with an architecture describing the relationship between the processes.

*Process Assessment Model (PAM):* A model suitable for the purpose of assessing process capability, based on one or more Process Reference Models.

*(Assessment) Indicator:* Sources of objective evidence used to support the assessors’ judgement in rating process attributes. Indicators explicitly address the purposes and outcomes, of all the processes within the scope of the Process Assessment Model, and demonstrate the achievement of the process attributes.