

# Chapter 10

## Thinking in Terms of Design Decisions When Developing Maturity Models

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### ABSTRACT

*To measure dedicated aspects of “maturity”, a range of maturity models have been developed in the field of information systems by practitioners and academics over the past years. Despite its broad proliferation, the concept has not escaped criticism. Unnecessary bureaucracy, poor theoretical foundation, and the impression of a falsified certainty to achieve success are a few examples. As there is a significant lack of knowledge on how to design theoretically sound and widely accepted maturity models, in this paper, the author opens the discussion on design decisions when developing these models. Based on analogy and informed arguments, the author synthesizes a generic but adjuvant framework that consists of five common design steps and eighteen decision parameters that help practitioners as well as researchers in the development of maturity models.*

### INTRODUCTION

As the complexity of business and information systems engineering is constantly growing, the development and use of reusable models that capture concepts common to many enterprises is enjoy-

ing great popularity. These models – commonly referred to as reference models (IFIP–IFAC Task Force on Architectures for Enterprise Integration, 1999) – claim to include reusable efficient state-of-the-art practices, thus constituting a reference for a certain domain (Rosemann, 2003; vom Brocke, 2007). The ‘reference’ character of a model can either emerge from common practice (e.g. implicit

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and explicit rules and habits within an industry) or from best practice (e.g. innovation stimuli of the industry leader) (Becker et al., 2002).

Although today the discussion of reference models mostly is focused on the standardization of business processes, reference models can cover other fields like for example software engineering, customizing, knowledge management or change management (Winter & Schelp, 2006). Reference models that especially focus on the evolution of systems (including processes, people and IT) are denominated maturity or assessment models. In accordance with Bush and Dunaway (2005) purpose of such a model is to “analyze how an organization really works, they help motivate it toward positive change, their procedures establish precedents that help organizations begin to transform themselves even before the assessment is finished, and they educate organizations by exposing them to best (or common) practices worldwide.”

Since the 1970s a multiplicity of different maturity models have been developed in science and practice. The popularity of maturity models was especially intensified by the introduction of the Capability Maturity Model (CMM) in the early 1990s and the deployment of other prevalent models such as ISO/IEC 15504 commonly referred to as SPICE (Software Process Improvement and Capability determination) or BOOTSTRAP. According to Mettler and Rohner (2009) more than 135 different models have been developed for the information systems (IS) domain. However, this makes it all the more surprising that no common accepted design methodology for maturity models exists. With this paper we therefore seek to address this issue by systematizing the few available design knowledge to a comprehensive development framework for maturity models. In doing so, the paper is organized as follows: After this introduction, we first provide a discussion on the foundation and critique on maturity models. Then, based on analogy of existing maturity model design methodologies, the common elements of a typical design process are delineated.

The high-level design process is particularized by discussing the most important decision parameters that must be answered in the course of the development of a maturity model. Finally, we present a brief synthesis of our findings and close with some concluding remarks and future research suggestions.

## **FOUNDATION AND CRITICISM ON MATURITY MODELS**

As described above, the purpose of maturity models is to give guidance through an evolutionary process by incorporating formality into the promising improvement activities. According to Fraser et al., all maturity models share the common property of defining a number of dimensions at several stages of maturity, with a description of characteristic performance at various levels of granularity (Fraser et al., 2002). Basic elements of maturity models are a number of levels (typically three to six), a descriptor for each level (such as the CMM's differentiation between initial, repeatable, defined, managed, and optimizing processes), a generic description or summary of the characteristics of each level as a whole, a number of dimensions (such as the ‘process areas’ in CMM), a number of elements or activities for each dimension, and a description of each element or activity as it might be performed at each level of maturity.

Depending on the structure and complexity of a maturity model, three different model types can be distinguished: Maturity grids represent the simplest form of a maturity model. According to Fraser et al. (2002) they typically are made up of a “text description for each activity at each level and is of moderate complexity, requiring at most a few pages of text.” Examples of maturity grids are found in Niazi et al. (2008), Aggestam (2006), and White (2007).

The most sophisticated maturity models, according to Fraser et al. commonly referred to as

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