

Maturity of information systems through CMMI and ITIL

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SUMMARY

There are many quality standards and maturity models that can help an organization improve its processes. However most of these standards are specialized in a single field of activity. So, in order to cover all of their activities, companies must adopt more than one standard.

In this article, we present two standards that are most used in the software development industry: CMMI and ITIL by specifying the specificities of each one, the common points and how they can live together in the information system of an organization. These standards have been initially designed by state agencies, the first in the United States by the DoD and the second in Britain by the CCTA.

Key words: CMMI, ITIL, SCAMPI, IS Management, quality, process, maturity model

1. EVALUATE THE MATURITY: INTERNAL QUALITY SYSTEM VERSUS QUALITY STANDARDS

Currently, there is a wide choice of maturity models, standards, methodologies, and guidelines that can help an organization improve the way it does business. The most of these standards derived from the anglo-saxon world, have flourished since the mid-1990s: CMMI, ITIL, COBIT, Six Sigma, ISO and ScoreCard to name only the best known [1]. The question then is "what standard adopt?", otherwise "should we use a standard or develop internally our own process model". According to Gartner the answer is decided: *the best way to move forward is to use models that exist on the market* [2].

The internal development of a model has many disadvantages and risks. First developing in-house model is expensive and requires ongoing maintenance and it can quickly become obsolete. Also a specific model of the company is more difficult to sell to customers.

However, most available improvement approaches focus on a specific part of the business and do not take a systemic approach to the problems that most organizations are facing. By focusing on improving one area of a business, these models have unfortunately perpetuated the stovepipes and barriers that exist in organizations [3]. It is therefore appropriate to choose among models and standards in the market according to their strengths, weaknesses and complementarity, and combine them to achieve optimal and meaningful synergy to the perimeter of improvement determined.

This paper presents an analysis of the maturity models CMMI and ITIL that cover the largest parts of information systems by specifying the specificities of each one, the common points and how they can coexist together. We adopt the following organization of the article: section 2 presents the architecture of the CMMI model and the scale of maturity proposed by this model, section 3 is dedicated to ITIL and we conclude with a summary and perspectives of research that can respond to our work.

2. CMMI MODEL

CMMI, *Capability Maturity Model Integration*, is a process improvement approach that contains the essential elements of effective processes for one or more areas of interest and describes an evolutionary improvement path from ad hoc, immature processes to disciplined, mature processes with improved quality and effectiveness. It provides a comprehensive integrated set of guidelines for developing products and services [3].

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CMMI contains practices that cover project management, process management, systems engineering, hardware engineering, software engineering and other supporting processes used in development and maintenance [3].

2.1 Architecture

The fundamental component of the CMMI model is “Process Area” (PA). It is defined in the CMMI Glossary as “A cluster of related practices in an area that, when implemented collectively, satisfies a set of goals considered important for making improvement in that area” (Figure 1).

The CMMI model defines five levels of maturity (*Maturity Level*) ranging from 1 to 5 (*initial, managed, defined, quantitatively managed and optimizing*) (Figure 2). A maturity level consists of related specific and generic practices for a predefined set of process areas that improve the organization’s overall performance (Figure 1).

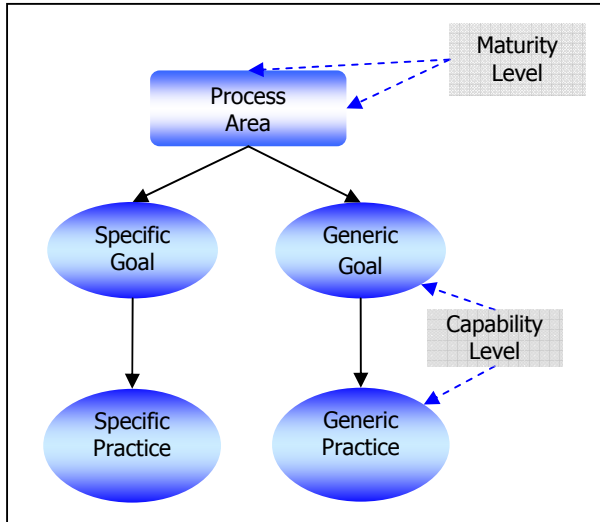


Figure 1. Process Area components

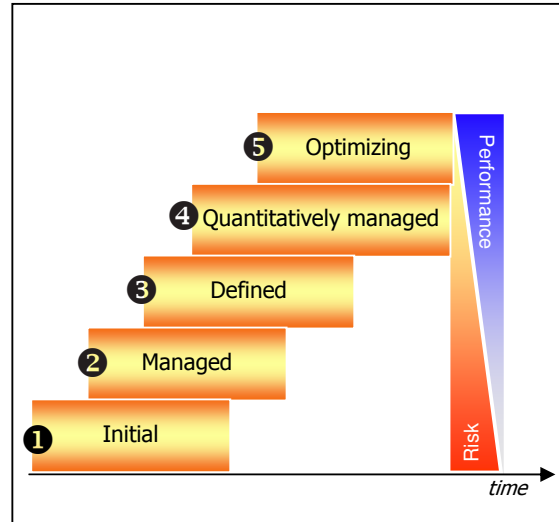


Figure 2. CMMI Maturity levels

2.2 Assessment and improvement

CMMI supports two improvement paths using levels. One path enables organizations to incrementally improve processes corresponding to an individual process area (or group of process areas) selected by the organization. The other path enables organizations to improve a set of related processes by incrementally addressing successive sets of process areas [3].

These two improvement paths are associated with the two types of levels: capability levels and maturity levels. These levels correspond to two approaches to process improvement called “representations.” The two representations are called “continuous” and “staged” (Figure 2). Using the continuous representation enables you to achieve “capability levels.” Using the staged representation enables you to achieve “maturity levels.” [3].

3. ITIL LIBRARY

ITIL (*Information Technology Infrastructure library*) is a set of best practice guidance for IT service management. It consists of a series of publications giving guidance on the provision of Quality IT Services, and on the processes and facilities needed to support them [7].

The current version (version 3) of the ITIL Library consists of six books key [5]:

- Introduction to ITIL Service Management Practices
- Service Strategy
- Service Design
- Service Transition
- Service Operation
- Continual Service Improvement

3.1 Service management lifecycle

ITIL V3 has introduced a new concept which is the life cycle of services (*Service Lifecycle*). At each phase of the life cycle are processes that define the associated activities.

The lifecycle of service includes 5 phases [6]:

- Strategy: defines how to view and implement service management.
- Design: provides guidance for the design and development of services and service management.
- Transition: development and implementation of new services and changes to service operation.
- Operation: maintenance of the effectiveness and efficiency in the delivery of services.
- Continuous improvement: evaluation of the process and implementation of improvement actions.

3.2 Assessment and improvement

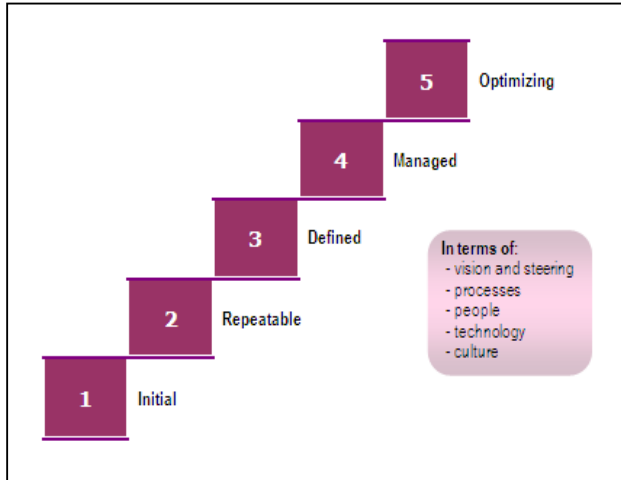


Figure 3. ITIL Process Maturity Framework

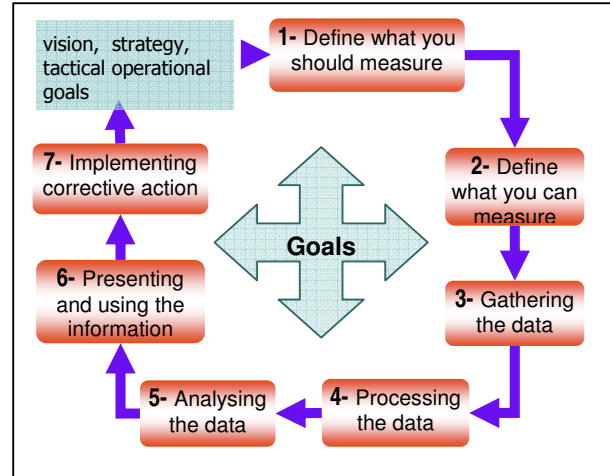


Figure 1. The 7-Step Improvement Process

The process improvement approach proposed by ITIL is based on the Deming model: PDCA (*Plan, Do, Check and Act*). It is a process in 7 steps (Figure 4), which is oriented objectives and strategy business and driven by performance indicators.

ITIL has defined a process maturity model called "*Process Maturity Framework*" (PMF). It can be used to individually assess the maturity of each process or to measure the maturity of the overall processes [8].

This model defines the maturity of the process on a scale of five levels of 1 to 5 (Figure 3): *initial, repeatable, defined, managed and optimizing*. Each level requires the development of a combination of elements to be effective. The evaluation of the process is then carried out to five areas: vision and leadership, processes, people, technology and culture.

4. CONCLUSION

Each standard or model describes a sector of activity of the company with a level of accuracy and specificity which is clean. George Box said "*all models are false! Some are useful*". A model cannot represent integral way the reality of the company.

CMMI is a standard for the development and maintenance of software and systems. Many companies adopted it and expressed their satisfaction in terms of effectiveness and return on investment. It is used for the management of the activities in "*project mode*" [4].

ITIL is recognized as a standard in Europe for service and operation management. It provides a framework for execution of these services and improved so that they are always in line with the expectations of customers. ITIL is adopted for the management of activities in the "*recurrent mode*". These are ongoing and repetitive operations.

However these two models share common characteristics:

- they are a set of best practices from experts and approved reflections;
- they are based on the process approach and seek continuous improvement;
- they inherit from the famous Deming PDCA model
- they allow the assessment of the maturity on a scale of 1 to 5 levels
- they are complementary and not exclusive
- are voluntary use and each company can adjust them according to its context
- do not provide use mode (provide the " what " and not the " how")

As a perspective of this study, we propose to formalize these standards and their implementation and to reflect on the process of alignment with the quality of an existing information system.

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