A Comparative Analysis between Maturity Models based on COBIT

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Abstract

IT Governance gains prominence in respect to the competitiveness of business, establishing a set of mechanisms that allow the idealization of objectives, control formulas, metrics for implementation of strategies and evaluation of results from the Information Technology and Communication. COBIT (Control Objectives for Information and Related Technology) is one of the frameworks of "good practices" that implements these strategies into practice and it is used by various organizations for service management of Information Technology (IT) to assist the implementation of frameworks maturity models exist that aim to identify at what level the organization is a matter of maturity. This article is a comparative analysis between three of these maturity models based on the COBIT in order to provide relevant guidance and easy its deployment.

1. Introduction

Currently, the increasingly present importance that IT has assumed in business strategies is easily identifiable, leaving increasingly obsolete the idea that IT is only intended to support the implementation of the activities. However, in the same dimension that the importance is given to companies in the IT field, the same happens for the responsibilities and requirements for the control and management of processes developed (EUROCOM, 2006).

To achieve increasingly refined and efficient performance standards that make possible a building performance with excellence for services developed within companies, the framework, COBIT helps IT governance with the primary objective of the union of best practices related to governance and IT control which, through its principles and rules, provides an improved verification of the processes and can be used both internally and by internal and external audits.

However, so that COBIT is implemented efficiently, According to the IT Governance Institute (ITGI, 2007), it is necessary that organizations understand the current situation of their own IT systems to define what level of management the company should possess. Thus, to decide what the right level at which processes should fit your organization, managers need to assess how far arriving and if the benefits justify the costs, increasing more and more the importance of maturity models to support the implementation of governance models.

2. Methodology

This work was based on a scientific literature review with the exploratory of indirect documentation. The direct documentation is based on interviews or questionnaires which was not our case. In this study we used the comparative and structuralist method (Marconi and Lakatos, 2004). This method was used to perform a comparative analysis between three maturity models to support IT governance based on COBIT, namely: the COBIT 4.1V, the ITOMAT (IT Organization Modeling Assessment Tool) and MMCBEES (Maturity Model in the E-learning Environment Teaching Adapted to the EHEA). Moreover, this work can be classified as an applied research, since the application is based on already developed theory, ie does not aim to discover new theories.

3. Maturity Models to Support Governance

Maturity models are increasingly used by IT managers to self-evaluation and may provide an approach for IT and control professionals understand and agree on priorities and areas that require more attention. Since the maturity models describe how processes are managed, an organization can figure out best practices for internal controls system of IT (PEDERIVA, 2003).

3.1. Generic maturity model of COBIT 4.1V

One of the tools available in COBIT for assistance and support in the maturity analysis is the generic maturity model. Referring COBIT processes and high level control objectives, the one responsible for a specific process must have the ability to improve it, reaching the level of control desired (ITGI, 2007). Table 1 illustrates the maturity levels of COBIT 4.1V with a description of each level.

Table 1: Maturity Model Generic COBIT. Source: Adapted from ITGI (2007).

LEVEL	DESCRIPTION
0 – Absent	1 There are no control. There is a complete lack of any identifiable process. Absent.
1 – Starter	⅄ Present evidence that the organization has recognized the need for process management and make use of standard procedures • *ad hoc* approaches are being applied in individual cases, so the management is disorganized.
2 – Repetitious	1. Processes already standardized. 2. There is no formal training or formalized procedures for communication thereby given responsibility individually, there are single knowledge dependency, as soon increasing the error rate.
3 – Defined	• The processes are formalized, there is documentation, training and defined communication

	• The procedures are not sophisticated but the formalization refers to existing ones.
4 – Managed	• Processes in improvement, already provide good practice. But lacking of automation tools • You can monitor and measure the agreement with procedures and take appropriate action when processes do not seem to be working effectively
5 – Optimized	1. The processes are already refined from the best practices identified 2. There is already institutionalization of best practices. 3. IT is used in an integrated way to automate the workflow, providing tools to improve quality and effectiveness, making quick adjustments the organization

The model of COBIT is focused on capabilities and not necessarily for performance, with its levels designed to promote in an understandable way a description for organizations to identify how they can fit into your processes. The correct level can be set through the organization type, its environment and its strategy. The performance is based on cost-benefit decisions. Thus, the higher the level of maturity, greater control over the process.

3.2. ITOMAT

ITOMAT is a governance support model based on COBIT framework, and as say Mårten Simonsson (2006), COBIT does not completely met all requirements regarding the evaluation of IT governance.

The ITOMAT is composed by the language model, which promotes a descriptive representation of how IT is governed within the company evaluated. The framework of analysis provides support for the evaluation of whether the given structure of IT governance is good or bad. The structure of COBIT in which the ITOMAT was based allowed the identification of entities and relationships as follows:

- **Entities -** The notion of processes to describe the IT organization is commonly used and was inherited directly from COBIT. The contents of 34 processes relevant to management control and operation of IT is detailed. No less than 19 different stakeholders for IT governance are presented in COBIT since few IT organizations employ them all. The role of the entity ITOMAT presents a coarser representation with only five stakeholder groups.

- **Relations -** The relations provided by COBIT claim that every IT related activity may be associated with a role (role) so the role is a responsible consulted or informed regarding the activity. However, in ITOMAT, the relationships connect papers processes instead of activities. This decision was made to minimize the number of relationships to be modeled in which COBIT originally said that four relations must be mapped to 19 functions and about 200 activities.

Table 2 illustrates the rules between roles in ITOMAT and COBIT.

Table 2: between ITOMAT and COBIT. Source: Mårten Simonsson (2008).

ITOMAT role	COBIT role
Executivos	Board of Directors
	Executive Director

	Finance Director
Business	Executive
	Business Processes
	Senior Business Management
IT Management	Head of Information
	Chief Architect
	Head Development
	Director of Program Management
IT Operations	Head Operations
	Implementation Team
	Head of IT Administration
	Department of Formation
	Services Manager
	Service Desk/Incident Manager
	Configuration Manager
	Problem Manager
Compliance Audit and Security Risks	Compliance Audit and Security Risks Team

The ITOMAT suggests the mapping of these relationships for only five roles (roles) and 34 processes. As mentioned previously the interfaces between COBIT processes contain mostly documents. For this model relations to denote inputs (inputs) and outputs (outputs) were created. A relation of measurements connects a metric to a process. Finally, part of the relationship denotes that the file contains one or more activities.

3.3. MMCbEEES

Over time were created different maturity models targeted to different contexts, focusing on a model for the European Area of Higher Education provided by (cocon; FERNÁNDEZ 2011) has been created a new model that aims as field the evaluation of online courses involved in the qualification of graduation, this model possesses levels of maturity evaluation criteria and process definition for the purposes of this evaluation.

The MMCbEES model proposes an approach concerning the assessment of the maturity of the contents that are passed by the teachers, both online and in activities in their classrooms so that they can seek greater process excellence.

The maturity levels of MMCbEEES were created to compose the evaluation of the Maturity Model basis of Higher Education Committee. There are 5 levels: Basic, Planning, Standardized, Controlled, Optimized.

a) **Nível 1 – Basic:** the results depend solely on teachers regarding the preparation of lessons and tools that will be used for the passage of the content. The final result will be on their hands, which used their creativity, rather than well-defined processes. Teachers will only use your intelligence to try to get the best use of research tools in the making of educational material.
b) **Nível 2 – Planning:** the courses must possess the attributes and characteristics in reference to the main criteria of the level of maturity, which are arranged in the table below, where these attributes and features that aim to develop plans and programs of various classes and courses does not only need the excessive use of information technology but a better and more appropriate use of learning methodologies. At this level, teachers possess a better preparation on the methodological and technological resources that may use in developing their courses modules among others.

c) **Nível 3 – Standardized:** This level will focus on quality and design regarding to units of content. In other words, it will focus on the evaluation of the quality on learning and on the creation of activities as modules, among others, thus having a vision of how to meet the educational objectives having total capacity to analyze and develop training in order to have a better quality of teaching.

d) **Nível 4 – Controlled:** At this level, will be addressed the strategic management of the key elements or the development of the curricula tree. It will show a set of best practices so that they will have better control in the administration and development of the units in the matrix of teaching techniques such as peer review of old arrays (per review), which will analyze and identify the deficiencies to be corrected in each module and can ensure that the teaching quality is.

e) **Nível 5 – Optimized:** This level will display the continuous improvement of the teaching processes through plans, quality metrics and procedures that will maintain the evolution of maturity and quality of the processes, that will contribute to the quality assurance and teaching and online learning. The processes at level 5 already possess a high cohesion and a much improved quality, from content creation to reuse in other units of instruction through content management systems and learning.

The evaluation process begins with the completion of the survey in order to understand the problems that are happening in the development process of the Subject Units (classes). One of the crucial parts of this process will be the definition and development of the procedures and actions that will address and correct the problems identified in the previous step. Subsequently should be fulfilled all actions and procedures created characterizing the most difficult step and very important, just as logically, plan and does not put into practice will not lead anywhere.

4. Comparative Analysis

To analyze the related maturity models in this study a comparison was structured in macroscopic view, which sought to present general data of these models were considered more important in this research and are presented in Table 3.

Table 3: General data investigated models - Source: Author's Own.

CRITERIA	COBIT 4.1V	ITOMAT	MMCBEEES.
Authorship	ITGI (*IT Governance Institute*), ISACA.	Marten Simonsson. KTH, *Royal Institute of Technology*.	Felipe Cocón e Eugenio Fernández.
Year of Publication	2007	2008	2011.
Base Model	COBIT	COBIT	COBIT
Delimitation, Scope and Focus.	Applies to various branches of organizations, has focus on the IT area.	Generic to the object of the organization, with a focus on micro and small enterprises.	College Institutions in Europe.

Evaluation Instrument.	Evaluation questionnaires.	Evaluation questionnaires and Automated tools.	Investigative Method.
Representations.	staged	staged	staged
Number of Levels.	6	6	5
Overlapping of levels.	None	None	None

All models compared are based on COBIT, having MMCbEEES as the latest, and other common points that will be mentioned, so it is possible to compare them. most relevant to Criteria identify the positive and negative aspects about the models studied were: the extent of their improvement processes, as well as evaluation tools provided and their forms of representation.

The definition, scope and focus of each model was identified from the practices of each model, and as COBIT v4.1 the most comprehensive, applying to various models of organization. The ITOMAT focuses on small and micro enterprises as its practices are simpler to implement and fulfill the same standards of governance. The MMCbEEES was created to measure the maturity of higher education institutions in Europe, and will be considered very specific for this analysis to companies in general.

The ITOMAT has an efficient evaluation tool to assess their practices because it has the support of fully automated evaluation tools based on questionnaires. COBIT 4.1V is also based on questionnaires however lacks automated tools. At this point we can say that MMCbEEES perform a more subjective and highly dependent of the assessor.

Since the degree of competence of an organization is measured based only on a single value on the representation by stages, we conclude that it allows a better comparison between competitors and found that all the models analyzed have that kind of representation in common.

5. Conclusion

The paper presented shows the results of a comparative analysis of three models for the evaluation of processes constructed from the best practices of COBIT to define maturity. It was stressed that all models are analyzed your specifications, and COBIT 4.1V is the most suitable for a small company that has growth ambitions, the ITOMAT being directed toward a larger the organization that aims the deploy efficiently and governance and due to their specialization MMCbEEES is the most suitable for educational institutions who also want to set its levels of maturity in order to implement COBIT or other governance model.

We seek through a comparative analysis to present specifications for each model presented so as to easy the implementation of the model COBIT in a variety of organizations. We believe that these results serve as an incentive for the implementation of such models to optimize the management of both IT and other services and organizations in which they identify the effort and the return of the implementation of such models.

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