Towards a New Approach For Combining The IT Frameworks

Samir BAHSANI[1], Alami SEMMA[2] and Noura SELLAM[3]

**[1] Department of Mathematics and Computer Science, Faculty of Science and Techniques,
Hassan 1 University
Settat, Morocco**

**[2] Department of Mathematics and Computer Science, Faculty of Science and Techniques,
Hassan 1 University
Settat, Morocco**

**[3] Department of Communication Systems, INPT
National Institute of Posts and Telecommunications
Rabat, Morocco**

Abstract

There are various IT frameworks and best practices supporting Information Systems. Each has its own strenghts but none of them satisfies all of the IS requirements independently. In this paper we are studying the possibilities of pooling of the most used frameworks: ITIL, Cobit, PMbok, CMMI, ISO 27001, Val IT and eTOM.

The result of this paper is meant to present a Unified Maturity Model combining IS standards and IT frameworks concurrently in order to get a greater insight on the information system' maturity and improve the enterprise's IT services.

Keywords: *Information systems, governance, frameworks, pooling, maturity of Information Systems.*

1. Introduction

It is within such a turbulent economic environment marked by a challenging growth [1] and perpetual change on different business aspects that a company seeks to increase its capacity to quickly change its strategies concerning management, resources and market [2]. These organizational and technological changes must be regarded as an opportunity because they allow the company to re-position itself effectively to ensure a continuous flow of market insights into their business or taking part of the competitive market by offering new products and services [3].

In this context, many frameworks, technical and IS management standards have emerged following these challenges. Some standards that are inspired from business good practices promote continuous improvement and help ensure the quality and continuity of IT services.

These standards can be mentioned among others: ITIL (Information Technology Infrastructure Library) for the production and life cycle management of IT, COBIT (Control Objectives for Information and related Technology) for governance, IS0 27001 (International Organization for Standardization) for security, PMP (project Management Professional) for project management, CMMI (Capability Maturity Model Integration) for the evaluation of the system development, hardware and/or software, Val IT (Value of Information Technology) that deals with the issue of creating value by the Information System Direction (ISD) projects that are offering an evaluation of IT investments [4].

Whatever the adopted framework is, its implementation should bring new management concepts regarding processes and contribute to the improvement of product and service development process, customer satisfaction and economy of time and that of resources [5].
In this article we study the possibilities of pooling of several IT standards.

2. Positioning of IT Frameworks in the Value Chain

The Value Chain is a set of the required steps to produce a company's added value. The Value Chain of an ISD is a set of functional blocks involved in the creation process of the IS value used in the business [6].
Therefore, every ISD should have its own Value Chain. For our part, we propose the following generic representation of the IT Value Chain.

IJCSI International Journal of Computer Science Issues, Volume 12, Issue 1, No 1, January 2015
ISSN (Print): 1694-0814 | ISSN (Online): 1694-0784
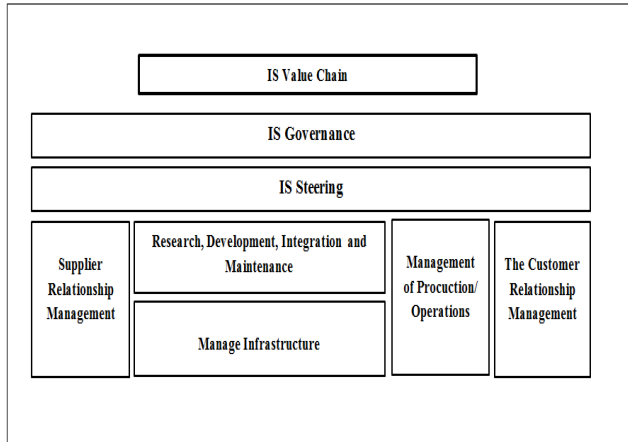www.IJCSI.org

119

Fig. 1 IS Value Chain.

The information system is divided into series of activities which are linked by several standards and frameworks. The position of each framework in the IS Value Chain is based on their nature and purpose.
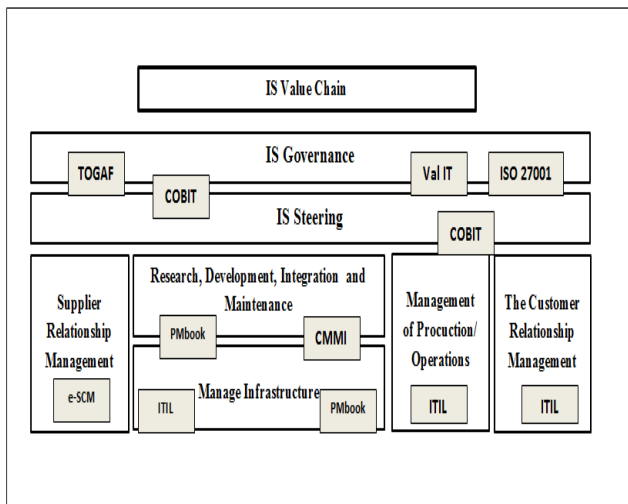

Fig. 2: Position of standards in the IS Value Chain.

The frameworks used across the Value Chain give a clear vision about the area of intervention of each standard and the kind of contribution expected for the IS.

3. Comparative Study of IT Frameworks

In order to address the challenges of the ISD, the implementation of good practice and governance standards is considered as one of the most optimized processes, the choice of adopting a specific standard depends on the desired objective and requirements.

For a complete overview on the large covered areas of the ISD and deeply on a particular concern of the Direction, a

detailed mapping is necessary to identify both the selection criteria benchmarks and the links between them, and the positioning of standards in the ISD value chain.

The table below provides a wide view of the coverage of ISD concerns by the most used standards in the governance of Information Systems.

The selected classification criteria are:

- **Concern:** We designate the types of activities that concern all of the Information System Direction. Such as the control and audit of information systems, management of the service's production, project management and security management etc.
- **The associated standards:** Some standards are a continuation of the other, such as the case of Val IT with Cobit and ISO 27001 with 27000.
- **Compatibility with other standards:** Some standards are used jointly and compatibility between some standards is more obvious than others.
- **Approach:** The standards usually have a main purpose: Either a process approach, a maturity model or a set of good practices.

In fact, however that an IS concern is addressed by several frameworks at a time, each one has its own vocation and specialty, e.g. ITIL is known for its strength in the treatment of the IS operations and services' management, PMP is made primarily to manage projects. To select the areas of crosscutting concern, it is important to classify them as generic categories in order to cover several themes.

The map above allows having a global view on the links between standards and their opportunities for synergy and mutual use. However, positioning in the value chain is still needed to link the reference to the categories of IS activities.

Our study compared the IT standards 'processes and best practices and maps them. As a result of the comparison, all standards considered have some similarities. Each standard supports the IS concerns partially, moderately or fully which can help companies to implement these standards together to improve their IT services and their business productivity.

Table 1: IS concerns' area of coverage by IT Frameworks

IS Concerns /Framework	Manage Budget	Manage Competences	Manage quality and intern control	Manage risks	Manage services	Manage changes	Manage needs	Manage incidents	Manage problems	Manage put into production	Manage configurations	Assist client	Manage projects	Develop IT solutions	Manage supplier relationship	Manage billing	Manage security and continuity	Manage communication	Manage legal compliance	Manage quality	Manage capacity	Manage availability	Approach adopted	Associated standards	Compatible standards
ITIL					+++	+++		+++	+++	+++	+++	+++		+	++		++	++			+++	+++	Process based on client satisfaction	ISO 20000	ISO 20000 ISO27001 CMMI COBIT
COBIT	+	+	++	+	++	++		+		+	+	++	+			+	+	++	++	+	++	+	Indicators and metrics. Process		ITIL, ISO 17799, COSO
PMBOK	++	+		+	+	+					+		+++					+		+			Model of « best practices » organized on 44 process		CMMI ISO 9001
CMMI							+++		+		+		++	+++	++				++				Approach by process and « maturity » Models	Six Sigma	ITIL COBIT
ISO 27001																	+++		++				Best practices and action plans to ensure a good level of security	ISO 27000, ISO 27002, ISO 27003, ISO 27004, ISO 27005, ISO 27006/7	COBIT ITIL CMMI
Val IT	+	+	+				+						+										Best practices	COBIT	COBIT ITIL CMMI
eTOM	+	+	++	+	+	+	+	+	+	+	++	++	++	++	++	+++	+++	++	++	+++	+++	+++	By process	The following Tm-forum to be considered: E-tom, TAM, SID and TNA	COBIT ITIL 27001

+   Partially supported.

++   Moderately supported.

+++ Fully supported

IJCSI International Journal of Computer Science Issues, Volume 12, Issue 1, No 1, January 2015
ISSN (Print): 1694-0814 | ISSN (Online): 1694-0784
www.IJCSI.org

121

4. Areas of coverage

Our approach provides a pooling of the most used standards i.e. ITIL, COBIT, PMBOOK, CMMI, IS0 27001 and provides also a set of process areas derived from a study of the IS concerns and proposals of existing standards. The table below summarizes a comparative study of the process areas covered by each standard.

Table 2: IS support by existing frameworks

IS Concerns/ Standards	ITIL	COBIT	PMBOOK	CMMI	ISO 27001
Manage budget		x	x		
Manage Competences		x	x		
Manage quality and intern		x			
Manage risks		x	x		
Manage services	x	x	x		
Manage changes	x	x	x		
Manage requirements				x	
Manage incidents	x	x			
Manage problems	x			x	
Manage put into production	x	x			
Manage configurations	x	x	x	x	
Assist client	x	x			
Manage projects		x	x	x	
Develop IT solutions	x			x	
Manage supplier Relationship				x	
Manage billing		x			
Manage security and continuity	x	x			x
Manage communication	x	x	x		
Manage legal compliance		x			x
Ensure the quality		x	x	x	
Manage capacity	x	x			
Manage availability	x	x			

The figure below shows the intersections between standards, each standard is considered as a set of components which are considered as concerns. As it is shown below, several concerns are addressed by one or more standard.
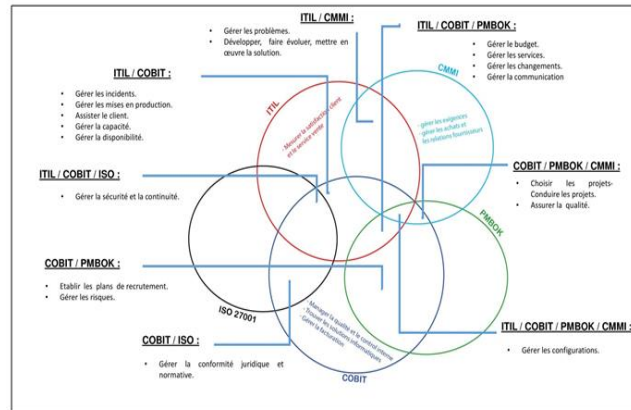

Fig. 3: Common concerns between standards.

After drawing up a detailed study of the IS areas of concern, we opted to unify processes around eleven process areas. For each process area we proposed processes emanating from different existing standards as well as the authors' experience.

The highlight of the model we propose is that it allows using the strengths of each standard into a single unified model that can be implemented easily.

The proposed Maturity Unified Model defines 11 processes that can be covered with a given percentage for measuring and evaluating the IS maturity.

Hence, an Information System is classified over 4 levels of maturity defining the degree and level of maturity of the concerned Information System. These levels are:

- Level 1: An IS with this level is assumed to have an Elementary level.
- Level 2: An IS with this level is assumed to have a Medium level.
- Level 3: An IS with this level is assumed to be developed.
- Level 4: An IS with this level is assumed to have an Advanced level.

Process and IS value \Levels	Level 1	Level 2	Level 3	Level 4
Management of Operations	• Intervention on cal. • Unregistered interventions	• service requests management. • Incident Management	• service requests management. • Incident and Problem Management.	• Gestion de la mise en production
Research, Development and Maintenance	• Lack of Acquisition Procès. • Acquisition by heterogeneous modes	• Processus Acquisition. • Lack of procedures' Acquisition	• Acquisition Process. • Procédures' Acquisition. • IS agility following a minor change	• IS agility following a minor change • Application Maintenance
Manage infrastructure	• No inventory or inventory not updated. • Lack of Acquisition processes • Acquisition by heterogeneous modes	• Inventory of soft and hard updated. • Processus Acquisition. • Lack of procedure aquisition.	• Change Management • Acquisition Process • Acquisition Procedures	• Infrastructure Maintenance
Manage IS investments	• unplanned Investments • Investments to the need and demand	• Investment and operating budget for year n	• Investment budget and operating for years n, n + 1, n + 2. • Descriptions of investment projects.	• Investment budget and operating for years n, n + 1, n + 2. • Study of technical and financial pre profitability of investment projects
Manage IS Human Resources	• post profile suitability. • Low. • training Lack	• Recruitment in demand. • low training rate	• sheet positions. • Planning recruitment. • IS Staff training necessary	• sheet positions. • Planning recruitment. • Training Plan. • Jobs and career management GPEC
Master of IS risks	• Unidentified risks	• Identified risk but without elimination	• Risk Assessment Matrix with elimination. • Without security manager. • Rights Matrix	• Risk Assessment Matrix with elimination. • designated safety responsible
IS Logistics	• Internal Information	• Internal IT contracts with suppliers	• Study of profitability of existing modes: Internalizing / Outsourcing	• existing modes profitability study: Internalizing / Outsourcing • well defined outsourcing strategy
Supplier Relationship Management	• classical relationship (Quotation Management)	• standard contract	• Suppliers Service Agreement. • Repository providers. • Extranet. • Definition of service levels	• Suppliers Service Agreement. • Repository providers. • Extranet. • Definition of service levels. • Continuous Assessment Suppliers. • Installing SRM
The Customer Relationship Management	• Lack of customer relationship	• existing customer relationship. • Lack of customer-oriented strategy	• customer oriented strategy. • Customer Service Contract with ALS	• Customer oriented strategy. • Client Service Agreement with ALS. • CRM management tool customer relationship
IS Governance	• Lack of IT Action Plan	• Existence of action plan. • IT road Leaves	• Existence of action plan. • IT road leaves. • Existence of an IT Strategic Plan and • Oriented ISD Organization Project	• Existence of action plan. • IT road leaves. • Existence of IT and Strategic Plan. • Organization DSI oriented Project. • Define the architecture of the IS, choices and technological orientation. • DG Committee Decision Guidance and Information
The Steering IS	• Lack of project management	• classical Project Management. • Lack of performance indicators and monitoring of IS	• project management. • Periodic Table IF board. • Controlling	• project management. • Periodic IS board Table. • Controlling. • Monitor and evaluate the performance of IS. • Monitor and evaluate internal control: Intrusions, access, backups, .. • Process shared Cartography. • Shared procedures Cartography.

Table 3: Process maturity level according to the Maturity Unified Model proposed

IJCSI International Journal of Computer Science Issues, Volume 12, Issue 1, No 1, January 2015
ISSN (Print): 1694-0814 | ISSN (Online): 1694-0784
www.IJCSI.org

123

4. Conclusions

Standards of good practices have been designed to meet the needs of structuring information systems management processes. The diversity of standards vocations and wealth makes their use tedious and expensive. IS Managers are confronted to multiple standards having each own terminology, proper processes and a separate implementation methodology. Articles about this are increasing, and each initiative attempts to focus on the possibilities of "mapping" two or more standards [7] [8]. At the end of this article a model of unified standards is proposed to solve the redundancy problem of standards.

Moreover, the effectiveness of a standard implementation depends on the level of maturity of the various IS management processes. It would be then necessary to include such reference in a unified process of evaluating capacities and global maturity of the IS.

References

[1] Kamprath, N. and Röglinger, M. (2011), Ökonomische Planung von Prozessverbesserungsmaßnahmen – Ein modelltheoretischer Ansatz auf Grundlage CMMI-basierter Prozessreifegradmodelle. Internationale Tagung Wirtschaftsinformatik (WI2011). Zürich, Switzerland.

[2] P. B. Nassar, Y. Badr, F. Biennier, K. Barbar ―Securing Collaborative Business Processes: A Methodology for Security Management in Service-Based Infrastructure", IFIP International Federation for Information Processing, Ifip Aict 384, 2012, pp. 480–487.

[3] D. Botta, K. Muldner, K. Hawkey, K. Beznosov, "Toward understanding distributed cognition in IT security management: the role of cues and norms", Cognition, Technology & Work, Volume 13, Issue 2, June 2011,

[4] Hill P. and Turbitt K,"Combine ITIL and COBIT to MeetBusiness Challenges", BMC Software, 2007, BMC_BPWP_ITIL_COBIT_06.pdf Companies by type, (n.d.). In Wikipedia, Retrieved July 2008

[5] Tanguy Crusson. Business process management : De la modélisation à l'exécution, positionnement par rapport aux architectures orientées services. Intalio, 2003.

[6] Michael Porter, "Competitive Advantage: Creating and Sustaining superior Performance" (1985)

[7] S. Bahsani, A. Himi, H. Moubtakir, A. Semma: Towards a pooling of ITIL V3 and COBIT, IJCSI International Journal of Computer Science Issues, Vol. 8, Issue 4, No 2, 2011.

[8] IT Governance Institute: Aligning CobiT® 4.1, ITIL® V3 and ISO/IEC 27002 for Business Benefit, 2008