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THE MAIN BENEFITS OF COBIT IN
A HIGH PUBLIC EDUCATIONAL
INSTITUTION - A CASE STUDY

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THE MAIN BENEFITS OF COBIT IN A HIGH PUBLIC EDUCATIONAL INSTITUTION – A CASE STUDY

Abstract

Currently, organizations move from the need to produce high rates of profitability, by the satisfaction of their customers, partners or employees, and by the maintenance of high levels of competitiveness to enable them to face competition and ensure their survival. With the evolution of Information Systems and the Information Technology, increasingly organizations based its activities on these systems and technologies. There are several guidelines oriented to the management and control certain sectors of Information Technology like ISO 9001 standard, ITIL (Information Technology Infrastructure Library), ISO 27001 standard, CMM (Capability Maturity Model), COSO (Committee of Sponsoring Organizations) but the COBIT – Control Objectives for Information and Technology is the framework that covers all activities related to Information Technologies for the IT Governance. Considering the stated advantages of COBIT we present in this study the main benefits of using it for IT Governance in a High Public Portuguese Educational Institution. As part of the applicability of a Quality Management System (ISO 9001 standard certification), it was implemented the COBIT guidelines first to ensure the certification and next to implement mechanisms to make the IT Governance especially to manage and control the IT and IS. The Institution has improved significantly the quality of services, reduced the execution time of tasks in about 25%, monitor and control more efficiency the technological infrastructure, reduced 30% in the number of incidents resolved and finalized by the various informatics departments and reduced 10% in the number of reopened incidents.

Keywords: COBIT, Information Technology Governance.

1 STANDARDS AND FRAMEWORKS TO MANAGE AND CONTROL THE INFORMATION TECHNOLOGY

The Information Technology Governance (Korac-Kakabadse and Kakabadse, 2001) corresponds to a set of structures and processes to ensure that Information Technology (IT) support and adequately maximize the business objectives and strategies of the organization, adding value to the services delivered, weigh the risks and getting a return on IT investment. Currently, it is impossible to imagine a company or institution without a strong Information System (IS) or with IT area, to manage operational information and provide management information to executives for decision making. For this reason and because of the dependence of IS and IT to ensure the operational and strategic management of organizations, the IS need to be managed and controlled efficiently and constantly monitored. There are several guidelines oriented to manage and control certain sectors of IT like ISO 9001 (Cianfrani et al., 2000) standard, ITIL (Information Technology Infrastructure Library) (OGC, 2007), ISO 27001 standard (Calder, A. and Bon, 2006), CMM (Capability Maturity Model) (Paulk et al., 1995) (Debraceny, 2006), COSO (Committee of Sponsoring Organizations) (Moeller, 2007). However, the COBIT – Control Objectives for Information and Technology) (Guldentops and Haes, 2002) (Hussain and Siddiqui, 2005) (COBIT, 2007) is the framework that covers all activities related to IT and it is specially oriented to IT Governance.

The COBIT was developed by the IT Governance Institute in 1996 (Weill and Ross, 2004) with the ISACA – Information Systems Audit and Control Association (ISACA, 2009) and provides a framework that covers all activities of IT in special in the: strategic planning for IT, deliver and support, acquire and maintenance and monitor and control the IT. It is structured (COBIT, 2007) in three parts: i) Criteria for Information (or business requirements): to meet the objectives of business,

information needs to be in accordance with the criteria required of the business requirements: requirements for quality (quality, cost, delivery), trust requirements (effectiveness and efficiency of operations, reliability of information, compliance with laws and regulations), security requirements (confidentiality, integrity, availability); ii) IT resources: resources are managed by the IT processes of IT to provide information that the organization needs to achieve its objectives. These resources include: applications, information, infrastructure and people; iii) Procedures for IT: these cases bring together the main activities of IT in a model of process, facilitating the management of IT to meet the business needs. The processes of IT are defined and classified (COBIT, 2007) (Hussain and Siddiqui 2005) into 4 domains, with 34 processes of IT. These processes will be presented and defined in activities and tasks in the organization. Domains of the COBIT are grouped into 4 areas: plan and organize, acquire and implement, deliver and support, monitor and evaluate. Additionally, the COBIT presents a set of indicators to be monitored effectively to ensure that the control and monitoring of IS and IT is effective.

There are various standards and frameworks oriented for certain sectors of activity in the IT field in order to implement the IT Governance. The ITIL (Information Technology Infrastructure Library) (OGC, 2007) (Taylor et al., 2007) is a library that presents a set of best practices for managing IT services. It is focused on "how" must be the IT services and processes, or in other words, focuses on the delivery of services and support considering the technical aspects of monitoring the process. Compared with the ITIL, COBIT provides the framework that covers all activities of IT while ITIL is more focused on services management (service delivery and support of COBIT). The ITIL is more detailed and oriented to processes while COBIT helps to bind the ITIL best practices to the requirements of business and the IT managers. The standard ISO 27000 (Calder and Bon, 2006) aims at establishing procedures to make the safety management of IS. The CMM (Capability Maturity Model) (Paulk et al., 1995) (Debraceny, 2006) corresponds to a set of models of maturity oriented for governance in the IS being used for the IT control (in particular the software processes), providing an efficient method to classify the stage of the IT organization. The framework COSO (Committee of Sponsoring Organizations) (Moeller, 2007) is an accepted standard for establishing internal controls in organizations and to determine their effectiveness and can be applied to the IT area as well as any other area of the organization. The biggest difference between COBIT and COSO is that COSO is generic, it can be used in any activity of the company, while COBIT is specially oriented to the IT field.

2 CASE STUDY

The Viana do Castelo Polytechnic Institute (IPVC) is a High Public Portuguese Educational Institution (IPVC, 2009) that implemented a Quality Management System (QMS) (QMS, 2009) that allowed to ensure the ISO 9000 certification (Cianfrani et al., 2000). The QMS covers the activities of the IPVC materialized in many processes (Academic, Environment, Health and Safety, Social Services, Courses Creation/Restructuration, Training, Economic-financial management, Management of works and Infrastructure, Information Management, Management and Improvement System, Project Management, Information Systems Management, Observatory, Promotion and Image, Human Resources and Technical and Educational Resources). In the context of this work the "Information Systems Management" Process (ISMP) was elaborated tends as base the COBIT as we present in this case study.

2.1 Research Method

Olesen and Myers (1999) employed action research in their investigation of the relationship between the introduction of groupware into an organization and the consequent changes in individuals' work habits and the structure of the organization. The reason they give for adopting action research is that "it enables a researcher to intervene in the organization while at the same time generate knowledge about the process." (p. 321). Their research perspective was interpretive which allowed them to concentrate their research on how individuals attempted to make sense of the specific situation. As Olesen and Meyers, we employ a five-stage action research cycle comprising the following stages:

- Diagnosing: identify the research question;
- Action Planning: determine the actions to be undertaken to address the research question;
- Action Taking: conduct and monitor the planned actions;
- Evaluation: determine if the actions have addressed the research question;
- Specifying Learning: document the knowledge obtained by conducting the project;

2.1.1 Diagnosis

The IPVC is a High Public Educational Institution and has an organizational structure that integrates six organic units or schools: Education High School, Agrarian High School, Technology and High School Administration, Management Sciences High School, Nursing High School, Central Services and Social Services. The high schools are oriented for teaching projects and the Social Services oriented for the social services rendered to the students. The central services assure the institutional coordination of the personnel administration activities and the coordination of many departments as: patrimonial, administrative, financial, global planning and technical. Each unit has an organic set of Information Systems controlled and managed by the Informatics Department (ID) of each one. With the development and implementation of an improved infrastructure (fiber optic), the interconnection between the various services of the Organic Units have been centralized (e.g. academics, human resources, accounting, etc.) but nevertheless there are a several IS managed by the six ID with different policies and methodologies.

The local management of IS was not being efficient and several gaps in terms of organization specially in the: network infrastructure, management of the access to systems, difficulty in monitoring the services provided, difficulty in control the backups, etc. Moreover, the Institute became the most frequently available Data Center (disaster recovery, backups storage and web services) to the community (e.g. local authorities, digital regions) services in the IT field.

Given the diverse range of IT and the various IS that support administrative services, the diagnosis before the implementation of COBIT had several limitations and difficulties:

- Various IS without registration or monitoring of their performance: each unit was responsible for various organic systems and there aren't efficient registration of the information related to the problems occurring in the technological components;
- Provision of services to users: although the service is performed there wasn't a defined methodology for processing requests and the ID followed different ways to perform the same task. In addition it is not profitable best practices for performing work or services;
- Record of effective tasks: the tasks were carried out in various digital documents (and paper) and are not centralized;
- Difficulty in carrying out the survey and consultation of the components (hardware and software) of the entire technological infrastructure;
- Difficulty in centralize, monitor and receive requests for the support in each ID and the difficult to expedite processing of applications;
- Monitoring the indicators of performance: because of the way of recording the tasks the monitoring indicators of the service was performed by approximation and are not based on real data;
- There were no plans for performance, contingency and disaster recovery;
- Scheduling of tasks for implementation of monitoring systems: there aren't a plan to make the scheduling and monitoring backups associated with the IT and IS;
- Monitoring the components of the technology infrastructure: despite some IS are monitored by an ad-hoc way, there wasn't record of effective monitoring;
- Configuration of the technological infrastructure: The settings of the technological infrastructure (data access, network architecture, etc.) were based on digital documents (or in paper format) dispersed by the organic units and should be centralized for better control and management the components of the technological infrastructure;

- The backup data and settings of the systems was carried out ad-hoc without any registration or methodology routine;
- The form of support user services, purchase components, installation and reconfiguration of components was carried out in a ad-hoc way, without being based on a common procedure to the various organic units and the registration of applications by users are made in the different types of documents (paper, digital format, by e-mail);
- Difficulties in proceed with the change process by the IPVC collaborators due to cultural issues;

Effectively, all these difficulties didn't manage and control efficiently the components of technology infrastructure and the services of the various IS of the Organic Units, hindering the services performance, the IT monitor and control and difficult in apply best practices to solve problems and improve the quality of services. Therefore, the research question has been how to implement the COBIT in a High Public Educational Institution with many structural difficulties and with collaborators not much receptive to change.

2.1.2 Action Planning

To plan an "action plan" it was established a team to work with those responsible for the informatics services of the Organic Units and it was defined some initial tasks: analysis of all the needs and difficulties in informatics services for the control and monitoring the IT and the IS; study and research of the standards and existing frameworks for monitoring and control IS and IT; select a standard or framework to be implemented; analysis of the difficulties to implement ISO 9001 and the standard and framework selected; and delineate the rules and practices to help in the implementation.

After the examination of the various standards and frameworks (ISO 9001, CMM, COBIT, COSO, ISO 27000) oriented to manage and control the IT field, the fact is that COBIT is a well—known framework and it is and it was implemented and adopted in many countries and enterprises (Guldentops and Haes, 2002) (Ridley et al., 2004) (Sahibudin et al., 2008). For this reason and considering the work analysis it was decided to implement in the IPVC especially in the IS and IT field (Information Systems Management Process of the QMS) the guidelines of COBIT. One of the diagnosis analysis phase is that an organization and specially in the high public education field and according to the context, it should be selected a sub set of the COBIT objectives, activities and indicators to implement the framework. According to the ISO 9001 documentation (process matrix, procedures, forms, etc.) and the documentation specified with the IPVC QMS the identification of the procedures and requests has a specific representation: ISM-Number for the procedures and ISM/Number for the forms. This representation is mentioned and presented in the next figures of the procedures in order to clarify the usage of the QMS documentation. The COBIT covers all areas of IT and its application to the reality of IPVC were selected some activities. As we mentioned in the first section the COBIT is divided into four domains and each one is characterized by a set of processes. To do the mapping of COBIT, and considering that the IPVC QMS contained several cases, it was decided to consider sub-processes of the Information System Management Process of the four COBIT domains, and for each sub-process consider the activities from the subset of control objectives of COBIT. In addition each activity of the COBIT control objectives was mapped in the procedures of each sub-process activity.

Thus, the actions to be undertaken to address the research question were:

- Analyze and specify the needs and difficulties of diagnosis in existing information services for the control and monitoring of Information Systems as well as the difficulty of implementation and use of the documentation of ISO 9001;
- Study and investigate the existing standards and frameworks for monitoring and control the IT/IS;
- Analyze and specify the difficulties of implementation in the field of ISO 9001;
- Undertake the work of the team through the distribution of tasks and meetings with periodicity of 15 days within two months and one month in the months following;
- Select the standard (or framework) to implement (in this case the COBIT) and evaluate the impact of their applicability and use;
- Elaborate procedures for the different activities (control objectives of COBIT) of the QMS;

- Select Indicators to evaluate the performance of the IT and to improve quality of service;
- Set priorities for implementation of COBIT and begin the use of its documentation for a period of six months and evaluate necessary corrections;
- Monitor the implementation of procedures on each system in each Organic Unit;
- Consistently support the collaborators in each Organic Unit in order to encourage the use of COBIT documentation and practices.

2.1.3 Action Taking

The QMS implemented at the Viana do Castelo Polytechnic Institute as well as the processes that represent it seek the implementation of the Quality Policy. As we mentioned many process was implemented and the unique process related to the IS and IT area was the ISMP. It was needed to proceed with the action analysis and specification of all the needs and difficulties of diagnosis in existing information services for the IS control and monitoring as well as the difficulty of implementation and use of the ISO 9001 documentation. These steps were made in the first two months of the development (from January 2008 to February 2008). The most important needs and problems are described in section 2.1.1. The study and investigation of existing standards and frameworks for monitoring and control of IS and IT is briefly described in first section of this study. For the successful implementation of the project it was necessary to undertake the work of the team through the distribution of tasks. To monitor this action it was necessary to encourage the members of the team and schedule meetings with intervals of 15 days within two months and 30 days in the next months. The selection of an framework to implement the standard (in this case the COBIT) and the evaluation of the impact of their applicability and use was conducted and presented by all the team. Following the COBIT guidelines we structured this process (ISMP) dividing it in four sub-processes corresponding to the four COBIT domains: plan and organize the IS, acquire and implement IS, deliver and support the IS and monitor and evaluate the IS. These sub-processes are described bellow.

a) Plan and Organize the Information Systems

The main objective is covering the strategic domains of the IT in the organization in way that the IT contributes to the strategic objectives of the organization. Also contemplates the plan definition to evaluate the IT quality to reach these objectives. The input of this domain is the need to define a strategic plan for the IT and strategic documents (plans) to evaluate the quality of the system. The outputs are the IT strategic plan, the IT quality plan, and procedures to manage projects. The four activities of this domain are: align the business objectives with the IT objectives, elaborate an IS strategic plan, elaborate a tactical plan for the IT, implementation of IT Projects. For each activity it was implemented a procedure to achieve these objectives.

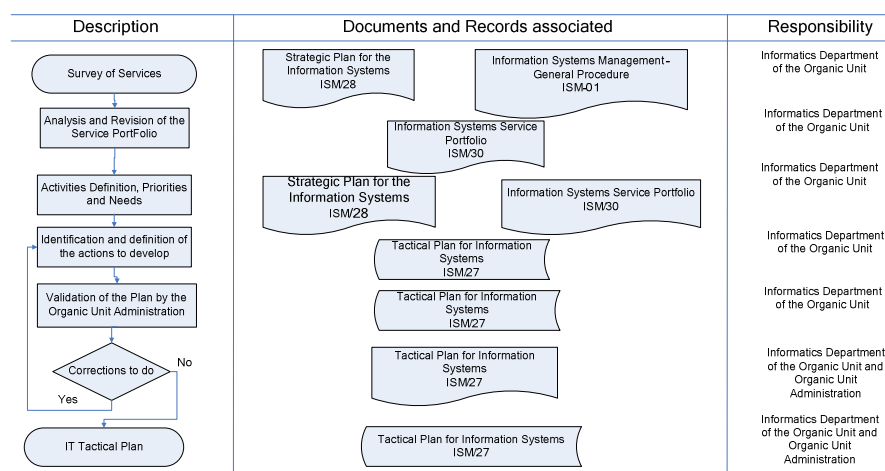


Figure 1 – Procedure to elaborate a tactical plan for Information Technology.

According to the ISO 9000 standard specification each procedure document must contemplate three columns: a flow (general description of the procedure), a column with the used documents and records in each step of the procedure and finally a column with the responsible of each step of the items flow. As a simple example of a procedure, the figure 1 presents a procedure for drawing up a tactical plan for IT. The other activities of this sub-process are: elaborate an IS strategic plan, elaborate a tactical plan for the IT and implementation of IT projects.

b) Acquire and Implement Information Systems

This sub-process (domain of COBIT) is centered in the definition of procedures to accomplish the strategy of the IT defined in the IT strategic plan of the sub-process "Plan and Organize the Information Systems". It defines procedures to proceed to the acquisition, installation and maintenance of the components of the IPVC technological infrastructure. As input of this domain it was defined the need to establish procedures to acquire, install and maintain the components of the technological infrastructure, strategic plan and documents of foreign origin. The output result is the procedures to make the purchase, installation and maintenance components of the technological infrastructure. As activities of this domain we have: acquire components for the technological infrastructure, install, reinstall and configure components in the technological infrastructure and maintenance of the technological infrastructure components.

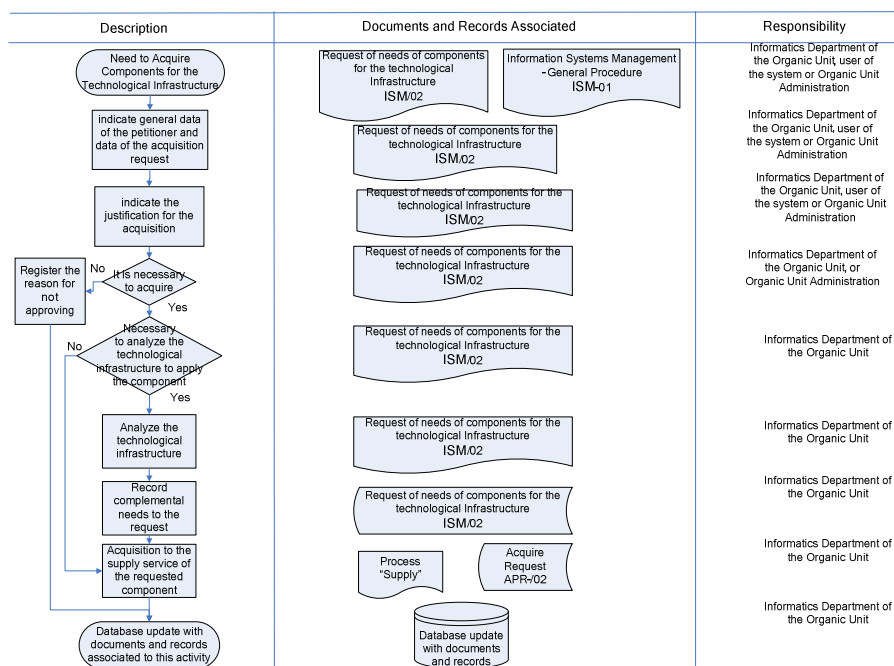


Figure 2 – Procedure to acquire components for the technological infrastructure

The objective of the procedure presented in the figure 2 is to define the steps in order to acquire components for the technological infrastructure. The other activities of this sub-process are: the acquire components for the technological infrastructure and the maintenance of the technological infrastructure components.

c) Deliver and Support of the Information Systems

This sub-process defines procedures to make available the IS for users. As input of this domain it was defined the need to establish procedures to ensure the availability and IT support, strategic plan and documents of foreign origin. The output results are the procedures to ensure the IT availability and support. In this sub-process there are defined procedures to characterize the following defined activities for COBIT:

- Manage Incidents in the technological infrastructure: the objective of this activity is to make available procedures to give effective and quickly answers to the questions and problems of IT submitted by the different users.
- Manage the Data of the technological infrastructure: this activity is centered in the management of the data and it includes procedures to manage the digital library, backups and recovery in order to guarantee the quality, answer in useful time and readiness of the necessary data for the activities of the Institution.
- Manage the configuration of the technological infrastructure: an effective configuration system management contributes to fiability of the system, minimizing the number of occurrences and contributing to a larger velocity in the solutions. In this context, this activity includes the collection of the information of the components configurations in the technological infrastructure.
- Ensure Systems Security of the technological infrastructure: the objective of this activity is centered in the need to maintain the integrity of the information and to protect the IT requesting security management processes. These processes include procedures to establish and maintain rules and security responsibilities, politics, standards and procedures to act in the IT field.
- Manage Performance and Capacity of the technological infrastructure: in order to guarantee the quality of the services available by the IT, there is the need to manage the acting and capacity of the resources of the technological infrastructure components. This activity defines an acting plan and capacity of the technological infrastructure components in way to be tested, monitored and appraised (in the sub-process "Monitor and Evaluate the Information Systems" in order to guarantee the quality of the services available by the IT).
- Ensure Continuous Service of the components of the technological infrastructure: the need to make available the continuity of the IT services request the development, maintenance and test the continuity plans, added with data storage procedures and periodic test to the continuity plan. This activity defines a plan to guarantee the continuity of the services to minimize the probability and the impact of the services interruption in the processes and functions key in the use of IT.

Manage Operations of the technological infrastructure components: this activity includes the definition of procedures to define the procedures of the operations associated to the technological infrastructure components, as for instance, to define the procedures to realize backups, backup restoring, test and evaluate the security, the continuity and the performance of the IT components. The rest of the activities of this sub-process are: user service desk, develop and maintain policy and requirements to perform the backups, make backups and restore backups, update the versions of the IS documents, develop and maintain a repository of settings for the technological infrastructure components, update configuration elements of the technological infrastructure components, define and maintain the security plan of the technological infrastructure components, define and maintain the users privileges in the technological infrastructure components, manage the users accounts of the technological Infrastructure, define and maintain the performance and capacity plan of the technological infrastructure components, define and maintain the contingency plan to guarantee the service continuity, define and maintain the disaster recovery plan of the technological infrastructure, define and maintain the action plan to accomplish in the disaster recovery's period, define and maintain the intervention plan in the technological infrastructure components, and define and maintain the task scheduler plan to control and monitor the technological infrastructure components.

d) Monitor and Evaluate the Information Systems

All the IT processes have to be made available in opportune time in way to guarantee the IS quality and to guarantee the IT strategic plan in the organization. In this context, this sub-process is centered in the definition of procedures to test, monitor and evaluate the acting, the security and the availability of the IT. As input of this domain it was defined the need to establish procedures to test, monitor and evaluate the services quality provided by the IT. As output we have procedures and reports for monitoring the components of the technological infra-structure in order to guarantee the service quality of the IPVC Information Systems.

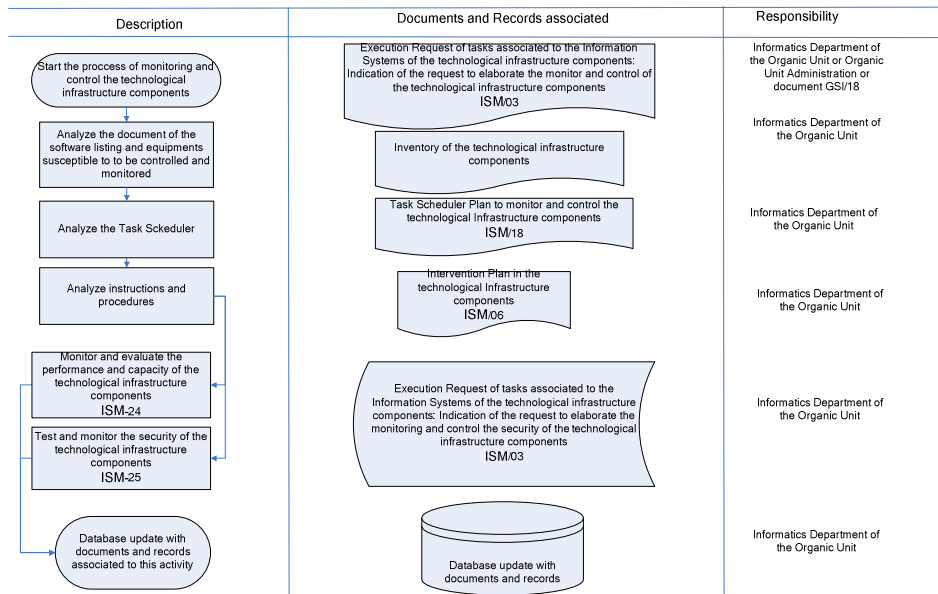


Figure 3 – Procedure to monitor and control the components of the infra-structure

In the figure 3 we present the procedure to monitor and control the components of the technological infrastructure. The other activities of this sub-process are: monitor and evaluate the performance and capacity of the technological infrastructure components, test and monitor the security of the technological infrastructure components, test the contingency plan to guarantee the services continuity and test the disaster recovery plan.

2.1.4 Evaluation

To evaluate the usage and implementation of COBIT it was defined two set of indicators. The first one (table 1) has the objective to analyse the first use of COBIT and the second one will be added gradually over time such as: average time to configure infrastructure components, # of infrastructure components that are no longer supportable, # of hours lost per user per month due to insufficient capacity planning, % of services meeting service levels, % of errors found during quality assurance review of installation and accreditation functions and application down time or data fixes caused by inadequate testing). We also monitored the satisfaction levels and formation associated with the clients/users of this process but are processed and analyzed in the IPVC QMS "observatory" process. The same treatment was done for the IS and IT suppliers.

Indicator/ Metric	Calculus Formula	Goal	Measure Time
1	Number of requests for support from its users caused by inadequate training	< 100	Year
2	Number of occurrences of application software for servers that caused losses of operation	< 150	Year
3	Average between the date of the occurrence of fault information and the date of resolution of computer incident	< until 4 days	Year
4	$(\text{Total incidents that require local support} / \text{Total of Incidents}) * 100$	< 50%	Year
5	$(\text{Events resolved and finalized} / \text{Total incidents finalized}) * 100$	> 60%	Year
6	$(\text{Total incidents reopened} / \text{Total of incidents}) * 100$	< 20%	Year
7	$(\text{Number of critical data backups} / \text{Total of critical data}) * 100$	> 90 %	Month
8	$(\text{Number of tests performed backups} / \text{Total number of backups performed}) * 100$	> 90 %	Month

Table 1 – List of the available indicators in compliceance with COBIT.

For this study, the monitoring of indicators was held from May 2008 till December. The eight months of analysis of the indicators presented in this study were compared with the same period recorded in 2007 (without using COBIT) and with no implementation of a monitoring system for the performance indicators. The values for 2007 were estimated based on records kept manually and recorded on paper

by each Organic Unit ID. To show more clearly the results presented in figure 4 we divided the indicators and each one will be compared with the same periods of the year 2007.

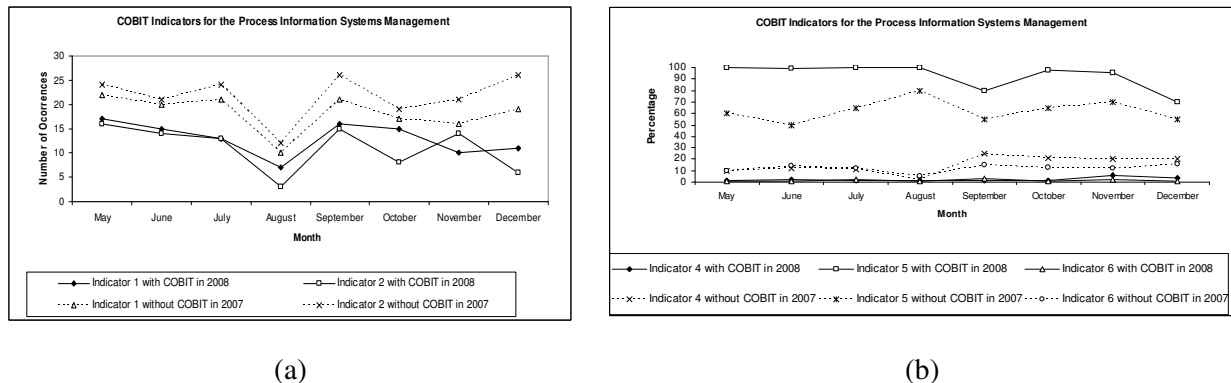


Figure 4 – (a) Comparison of Indicators 1 and 2 in 2008 and 2007 without using COBIT and (b) Comparison of Indicators 4, 5 and 6 in 2008 using COBIT and 2007 without using COBIT.

How can we analyze in the figure 4 (a) the number of requests for support from its users caused by inadequate training (Indicator 1) and annual number of occurrences of application software for servers that caused losses of operation (indicator 2) are higher in 2007 than in 2008 . There is an improvement in these indicators in about 15% for 2007 to 2008. The fact is that with the implementation of COBIT guidelines various strategic mechanisms were made by one side to ensure a better level of users training, and in order hand to define more efficient control mechanisms to monitor and control the components of the technological infrastructure. The number of days to reply (Indicator 3 of the table 2) of 2008 compared to 2007 fell by about 25%, effectively reducing it by more than a day and a half. This was due to the internal structure of the several ID services and the strategic guidance and implementation of the processing of applications based on the COBIT guidelines. The rate of incidents that require support (outside of the ID services) of the occurrence (Indicator 4) in 2007 compared to 2008 fell by about 7.4%. The reason for the improvement focuses on the improved efficiency of the installation type, configuration and maintenance of the components in its first use and by the regular maintenance. The rate of incidents resolved and finalized by the responsibility of ID services (indicator 5) improved compared to 2007 in about 70% focusing on 2008 at 92%. This was due to the definition of domestic priorities and the definition of planning and maintenance more efficient compared to 2007. The rate of incidents reopened (indicator 6) decreased by around 10% from about 10.7% in 2007 and 1.3% in 2008. This is justified by the increased efficiency of ID in the processing of requests from users as well as equipment maintenance.

	Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
I3	2007	0,2	0,23	0,21	0,18	1,2	1,3	0,61	0,38
	2008	2,1	1,9	1,6	1,1	2,4	2,2	2,6	1,8
	AVG	1,15	1,065	0,905	0,64	1,8	1,75	1,605	1,09
I7	2007	96	97	95	90	92	95	94	98
	2008	100	100	100	100	100	100	100	100
I8	2007	97	96	95	90	91	94	93	97
	2008	100	100	100	100	100	100	100	100

Table 2 – Comparison (in Percentage) of Indicators 3, 7 and 8 in 2008 using COBIT and 2007 without using COBIT.

With the implementation of COBIT several plans were drawn up (security, contingency, escalation, intervention) as well as the policy to make backups. With the implementation of the backups, the rate of backups of critical data (defined by the policy of backups) - Indicator 7 (I7 in the table 2) and the rate of successful tests of the data from the backups Information Systems - Indicator (I8 those mentioned in the table 2) is 100%. This is due by the implementation (and validation) of robust

mechanisms to make the backups as well as the number of backups of various generations IPVC IS. In 2007, the mechanisms for making backups were limited compared to 2008 and achieved an improvement of about 10% over the previous year mainly because the conditions of equipment oriented to this task.

2.2 Specifying Learning

With the use of COBIT for IT Governance the learning obtained was as follows:

- Improve the quality of care by the administrative services;
- Control and manage the IS more efficiently, defining processes and indicators to do it;
- Reduced the tasks execution time;
- The reduction by about 90% of the number of failures in communication between services and user;
- Helped to define specially indicators to evaluate the performance of the services in IT field;
- It was able to set policies and plans for managing the IT;
- The need for continuous training on the COBIT especially for those collaborators with less receptive to the change process;
- The need to exist an IS to support the COBIT documentation (and other standards ex. ISO 9001), and to allow the automatic achievement of indicators.
- The COBIT is a suitable framework for the implementation of the ISO 9001 certification standard and for IT Governance in Public Educational Institutions in the IS and IT field.

3 CONCLUSION

In this paper we described a case study of the implementation of COBIT - Control Objectives for Information and Technology in a High Public Educational Institution of Portugal. This institution is characterized by a number of schools scattered throughout the region north of Portugal and has several Information Systems (IS). With the dispersive of the IS and the support of the organization activities being supported by IS, there was the need to create mechanisms to guarantee the management and control of IS in particular to IT Governance. Several standards and frameworks exist to manage and monitor specific sectors in the Information Technology area, but the COBIT is a framework that covers all activities related to information technologies for the governance of IT. As part of the applicability of the IPVC Quality Management System the implementation of the ISO 9001 standard certification, was implemented the COBIT guidelines first to ensure the certification and next to implement mechanisms to make the IT Governance especially to manage and control the IT and IS. We concluded that the COBIT is a suitable framework for the implementation of the ISO 9001 certification standard and for IT Governance in Public Educational Institutions in the IS and IT field. With this implementation the Institution has improved significantly the quality of services, reduced the number of anomalies and provided more efficiently mechanisms to manage and control their various Information Systems. It was able to improve the quality of attendance, reduced the execution time of tasks in about 25%, more efficiency in monitoring and control the technological infrastructure components, reduced about 30% in the number of incidents resolved and finalized by the various departments of IT and reduced more than 10% the number of incidents reopened.

References

- COBIT (2007), "Information Systems Audit and Control Association, Control Objectives for Information and Related Technology, 4.1:th Edition, IT Governance Institute, 2007
- Calder, A. and Bon, J., (2006). "Information Security Based on ISO 27001/ISO 17799: A Management Guide", Van Haren Publishing.
- Cianfrani, C., Tsiakals, J., West, J., West, J. (2000). "Iso 9001: 2000 Explained". ASQC/Quality Press.
- Debraceny, R. (2006), "Re-engineering IT Internal Controls - Applying capability Maturity Models to the Evaluation of IT Controls", Proceedings of the 39th Hawaii International Conference on System Sciences.

- Guldentops, E., and Haes, S., (2002) "COBIT 3rd Edition Usage Survey: Growing Acceptance of COBIT", *Information Systems Control Journal*, Vol. 6, pp.25-31.
- Hussain, S. and Siddiqui, M. (2005). "Quantified Model of COBIT for Corporate IT Governance". In *Proceedings of the First International Conference on Information and Communication Technologies*.
- IPVC, (2009), "Official Site of the Viana do Castelo Polytechnic Institute (IPVC)". Available from: http://portal.ipvc.pt/portal/page/portal/ipvc_en
- ISACA, 2009. "The Official Site of Information Systems Audit and Control Association" – ISACA: <http://www.isaca.org/>
- Kaplan R., and Norton D., (2004), "Balanced Scorecard: Translating Strategy Into Action (Hardcover)", Boston: Harvard Business School Press.
- Korac-Kakabadse, K. and Kakabadse, A. (2001). "IS/IT Governance: Need For an Integrated Model". *Corporate Governance Journal*, volume 1, pages:9-11.
- Moeller, R., (2007), "COSO Enterprise Risk Management: Understanding the New Integrated ERM Framework", John Wiley and Son.
- Olesen, K. and Myers, D., (1999), "Trying To Improve Communication And Collaboration With Information Technology: An Action Research Project Which Failed", *Information Technology & People*, 12, (4), pages: 317-332.
- OGC, (2007). "Official Introduction to the Itil Service Lifecycle", Stationery Office, Office of Government Commerce.
- Pande, P. and Holpp, L., "What Is Six Sigma?", McGraw-Hill, 2001.
- Paulk, M., Weber, C., Curtis, B., Chrissis, M. (1995). "The Capability Maturity Model: Guidelines for Improving the Software Process (SEI Series in Software Engineering), Addison-Wesley Professional.
- PMI, (2008), "A Guide to the Project Management Body of Knowledge", Project Management Institute.
- QMS (2009), "Web site that supports the Quality Management System of the Viana do Castelo Polytechnic Institute. Available from: <http://www.sqg.ipvc.pt/publico.html>
- Ridley G., Young, J., and Carroll, P., (2004) "COBIT and its utilization - A framework from the literature", *Proceedings of the 37th Hawaii International Conference on System Sciences*, Hawaii.
- Sahibudin, S.; Sharifi, M.; Ayat, M., (2008). "Combining ITIL, COBIT and ISO/IEC 27002 in Order to Design a Comprehensive IT Framework in Organizations", *Proceedings of the 2008 Second Asia International Conference on Modelling & Simulation (AMS)*, Pages:749-753.
- Taylor, S., Iqbal, M., Nieves, M., (2007) "ITIL:Service Strategy", TSO publications.Norwith, UK.
- Weill, P. and J.W. Ross, (2004). "IT governance – How Top Performers Manage IT Decision Rights for Superior Results". Harvard Business School Press.