IT Governance using COBIT implemented in a High Public Educational Institution – A Case Study

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Abstract: - The organizations to be competitive have to provide services and delineate strategies to maintain high levels of profitability and efficiency to cope with changes in markets. Increasingly, organizations based their operational services through its Information Systems (IS) and Information Technology (IT) that need to be managed, controlled and monitored constantly. Although there are several guidelines oriented to the management and control of certain sectors of IT like COSO, ITIL, PMBok, CMM, ISO 27001 and Six Sigma. The COBIT – Control Objectives for Information and Technology is the framework that covers all activities related to IT for the IT Governance. Under the applicability of the quality services certification (ISO 9001 standard) in all IT and IS services of a High Public Portuguese Educational Institution, this paper presents a case study of the implementation and use of COBIT for IT Governance in that Institution. With the implementation of the framework the Institution could ensure the requirements for the quality services certification and manage and control efficiently there IS and IT and the results were very positive. 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.

Key-Words: - Information Technology Governance, COBIT, ISO 9001.

1 Introduction

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. The applicability of rules in order to guarantee the quality of services in the internal and external organizations become extremely important to ensure these objectives. Moreover, with the evolution of Information Systems (IS) and the Information Technology (TI), increasingly organizations based its activities on these systems technologies and these IS/IT become vital to guarantee a good performance and efficiency to the organization. Emerges clearly the importance of managing and control systems of the organization, but are also some issues to achieve those objectives: What guidelines we can follow for managing the Information Technology? What indicators we can specify to measure the management of Information Technology? What tools we can use to measure the maturity of IT Governance?. Many standards and frameworks [1] [2] [3] [4] [5] [6] have been developed in recent years to manage, control the IT as well as models [7] and tools [8] [9] to evaluate the maturity of IT Governance, especially applied in the organization to ensure the strategic objectives. In spite of these advantages of the various standards and frameworks, for the IT Governance the most recognized, publicly available framework for IT governance is COBIT – Control Objectives for Related Technology [6].

In the scope of the implementation of the Quality Management System (to obtain the services certification - ISO 9001 [10]) in a High Public Portuguese Educational Institution, this paper presents a case study for the use of COBIT to ensure in one hand the objectives of the services certification and to implement efficient mechanisms to control and manage the IT to ensure the IT Governance. To start the presentation of the implementation of this study we consider necessary before submitting the case study, make a brief presentation of the corporative governance concept especially in the IT Governance as well as the presentation of some standards and frameworks studied for achieving this work.

This document is organized as follows: first we introduce the IT Governance concept as an introduction to the need to govern the Information Technologies. After presenting a summary of the rules most relevant and likely to be applied in

Information Technology areas as well as provide a brief comparison between these standards. In chapter three we present the case study of COBIT implementation. Then we present the results and conclusions of the applicability of this study. In the last section presents the references to this study based.

2 Information Technology Governance

The Information Technology Governance [11] corresponds to a set of structures and processes to ensure that 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 investment in IT. The IT Governance is part of a Corporative Governance [12] and covers: Principles of Governance of IT: "Direction and Control", Accountability, Presentation of Results and Activities; Stakeholders of Governance and IT Governance framework of the IT. This last principle can be characterized by areas of intervention: Strategic Alignment, Value Delivery, Risk Management, Human Resource Management, and Performance Monitoring. The corporate governance is generally characterized by multiple levels (figure 1) operational (strategic, managerial and operational) and the lines strategies implemented by the Administration Council and Executive Management and implementation of these guidelines are out of the management of IT and business.

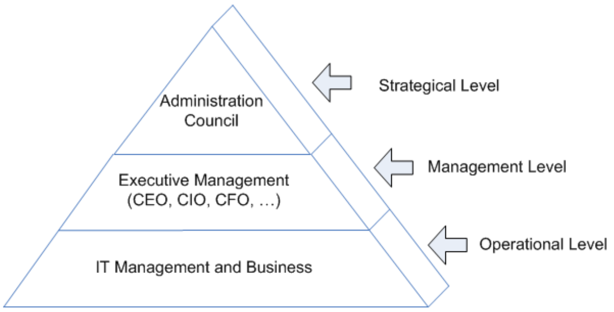


Fig. 1 – Operational levels of the Corporate Governance.

Currently, it is impossible to imagine a company or institution without a strong 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 [13] and constantly monitored

3 Standards and Frameworks to manage and control the Information Technology

As we mentioned, increasingly there is a need to develop mechanisms to ensure control and management of IT. This concern has been over the years materialized through the presentation of various standards and frameworks [1] [2] [3] [4] [5] [6] oriented to ensure the control and management in specific sectors associated with the IS and IT. The standard ISO 9000 [10] is a family of standards that specify the standards for the quality management systems of an organization. It is an extensive set of requirements, guidelines and other documents to support that together can provide a set of tools with which it can manage and improve the efficiency of organizations. In spite of cover all areas of an organization activity including the IS and IT field, this standard does not provide guidelines for the control and management of Information Systems being implemented in most cases in the IS area in particular delivery of services to customers and employees of an organization.

The ITIL (Information Technology Infrastructure Library) [3] [14] is a library that presents a set of best practices for managing IT services. It is focused on "how" must be services and processes of IT, or in other words, focuses on the delivery of services and support, considering the technical aspects of monitoring the process. This is a series of training manuals and books which expose and explain the practices that are more beneficial for IT services. The main objective of the ITIL is to provide managers means of managing high quality standards in order to obtain more value using the IT of their organizations. The advantages [15] of ITIL focus on the provision of guidelines for the use of best practices for IT, allows a greater speed in the analysis of the IT monitoring results by providing a clearer executive vision of the IT results. Has the peculiarity of being strong in cases of IT, but limited in security and systems development.

The standard ISO 17799 [16] – “Good practice for Information Security”, provides recommendations for information security management, directed to who is responsible for introducing, implementing or maintaining security organizations in particular the IS security. The standard ISO 27000 [17] aims at establishing procedures to make the security management of Information Systems. Previously ISO 17799 was originally prepared by the British Standards Institute [18] (BS7799) and adopted by the ISO/IEC (International Standards Organization/International Electrotechnic

Commission) [1]. The family of standards ISO 2700x is currently an accepted standard for management of information security, as regards the definition of implementation lines of the code of practice laid down in ISO 17799 standard.

The CMM (Capability Maturity Model) [19] [2] corresponds to a set of models of maturity oriented for governance in the IS being used for the IT control (in particular the processes of software), providing an efficient method to classify the stage of the IT organization. Has the peculiarity of focus in the implementation of the software delivery and control of the process. It is an approach derived from the model of maturity for software development SW-CMM (Capability Maturity Model for Software) [20], proposed by the SEI (Software Engineering Institute) [21]. This model is characterized by allowing the help to organizations to improve their processes for software delivery and process control.

The framework COSO (Committee of Sponsoring Organizations) [22] is an accepted standard for establishing internal controls in organizations and to determine their effectiveness and can be applied to the IT field as well as any other area of the organization. The COSO shows that internal control is a process established by the Administration Council, managers and others - designed to provide reasonable assurance regarding the achievement of objectives. It is a framework for auditing procedures applied in organizations. As we will present the COBIT [6] provides a detailed guide for IT. The biggest difference to COSO is that the COSO is generic, it can be used in any activity of the company, while COBIT is devoted exclusively to the area of IT.

The PMBOK [23], maintained by the Project Management Institute, is a collection of processes and areas of knowledge with generally accepted best practices for the project management (including projects in the areas of IT).

The BSC (Balanced Scorecard) [24] is an acronym which means balanced indicators for the performance. This is the name of a methodology focused on the strategic management of the companies that was created by Robert Kaplan and David Norton in 1992. Balanced Scorecard is an approach that allows the operationalization of the strategy, facilitating communication and understanding the strategic objectives to various organizational levels. Through the Balanced Scorecard the direction of companies have an integrated vision of the business and a continuous process of monitoring the performance.

The "Six Sigma" [25] is an innovative methodology focused on eliminating the defects in processes within an organization that aims to offer its customers more than one service/product, close to perfection.

The COBIT (Control Objectives for Information and related Technology) [6] [26] developed by the IT Governance Institute in 1996 [27] with the ISACA – Information Systems Audit And Control Association [28] provides a framework that covers all activities of IT, such as control and security. The main focus of COBIT is the development of clear policies and good practices for IT security and control, or to both focuses on controlling the process and in strategic control of the organization. Its first aim is to develop the control objectives from the objectives and business needs. Is structured [6] 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 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 needs of the business. The processes of IT are defined and classified into 4 areas [6] [29], with 34 cases of IT. These processes will be presented and defined in activities and tasks in the organization. The structure of COBIT are grouped into 4 domains: plan and organise, 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.

Comparison between COBIT and other standards is especially focused and analyzed in comparison with the COSO and ITIL. The COSO shows that internal control is a process established by the Administration Council, managers and others - designed to provide reasonable assurance regarding the achievement of stated objectives. It is a framework for auditing procedures applied in large companies in any business. The COBIT controls IT and introduce special attention to the information in general - not just financial information, which is required to support the requirements of business and the resources but also processes associated with IT. Just as COSO identifies 5 of control components to achieve the objectives of financial reporting, but the COBIT provides a detailed guide for IT. Has we mentioned the biggest difference is that the COSO is generic, it can be used in any activity of the company, while COBIT is aimed only to the IT area.

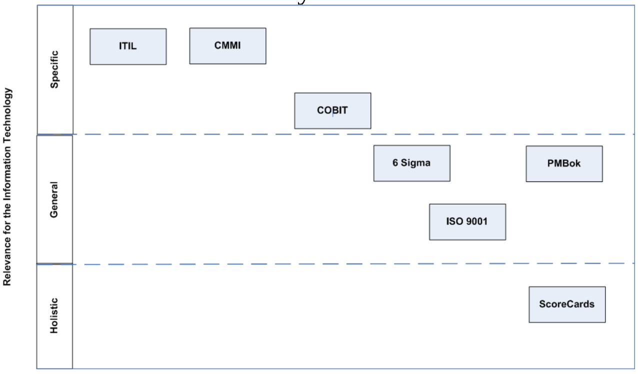


Fig. 2 –Standards relevance for Information Technology

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 COBIT and ITIL are not mutually exclusive and can be combined for a good IT Governance, control and best practices for IT management. The relevance of standards and practices (Figure 2) varies with the priorities and expectations of the companies. An organization may decide to adopt a standard in whole or only part of it to improve the performance of a business process or promote the transformation in the business. The COBIT is positioned in the centre (Figure 2) as a general level, helping to integrate the technical part, with the specific business practices in general. Its integration [30] with other standards it is a great asset to ensure greater efficiency in IT Governance.

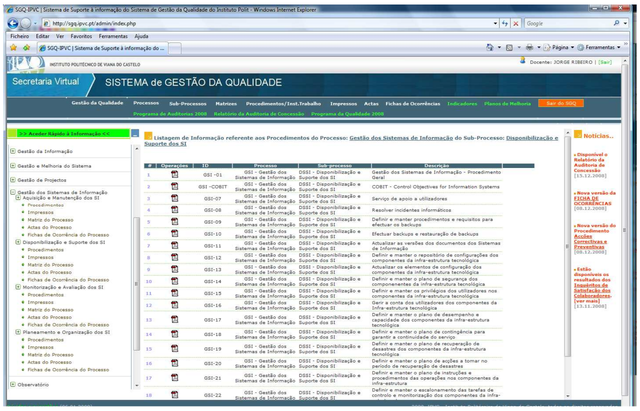
4 Case Study

This case study presents the implementation and use of COBIT for IT Governance in the Viana do Castelo Polytechnic Institute (IPVC) [31].

4.1 IPVC Context

The Viana do Castelo Polytechnic Institute is a High Public Educational Institution and has an organizational structure for integrated schools (or Organic Units) joined in the same mission. The geographical dispersion facilitates the commitment to sustainable development of the region whose size and the proximity allows teachers and students to create relationships to stimulate personal and professional training.

The IPVC 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.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Ferramentas
INSTITUTO POLITÉCNICO DE VIANA DO CASTELO
Docente: JORGE RIBEIRO | [Sair]
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Gestão da Qualidade
Processos
Sub-Processos
Matrizes
Procedimentos/Inst.Trabalho
Impressos
Actas
Fichas de Ocorrências
Indicadores
Planos de Melhoria
Sair do SGQ
Programa de Auditorias 2008
Relatório da Auditoria de Concessão
Programa da Qualidade 2008
>> Aceder Rápido à Informação <<
Gestão da Informação
Gestão e Melhoria do Sistema
Gestão de Projectos
Gestão dos Sistemas de Informação
Aquisição e Manutenção dos SI
Procedimentos
Impressos
Matriz do Processo
Actas do Processo
Fichas de Ocorrência do Processo
Disponibilização e Suporte dos SI
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Monitorização e Avaliação dos SI
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Planeamento e Organização dos SI
Procedimentos
Impressos
Matriz do Processo
Actas do Processo
Fichas de Ocorrência do Processo
Observatório
Notícias..

Listagem de Informação referente aos Procedimentos do Processo: Gestão dos Sistemas de Informação do Sub-Processo: Disponibilização e Suporte dos SI

#	Operações	ID	Processo	Sub-processo	Descrição
1		GSI -01	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Gestão dos Sistemas de Informação - Procedimento Geral
2		GSI -COBIT	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	COBIT - Control Objectives for Information Systems
3		GSI-07	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Serviço de apoio a utilizadores
4		GSI-08	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Resolver incidentes informáticos
5		GSI-09	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter procedimentos e requisitos para efectuar os backups
6		GSI-10	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Efectuar backups e restauração de backups
7		GSI-11	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Actualizar as versões dos documentos dos Sistemas de Informação
8		GSI-12	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter o repositório de configurações dos componentes da infra-estrutura tecnológica
9		GSI-13	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Actualizar os elementos de configuração dos componentes da infra-estrutura tecnológica
10		GSI-14	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter o plano de segurança dos componenentes da infra-estrutura tecnológica
11		GSI-15	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter os privilégios dos utilizadores nos componentes da infra-estrutura tecnológica
12		GSI-16	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Gerir a conta dos utilizadores dos componentes da Infra-estrutura tecnológica
13		GSI-17	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter o plano de desempenho e capacidade dos componentes da infra-estrutura tecnológica
14		GSI-18	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter o plano de contingência para garantir a continuidade do serviço
15		GSI-19	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter o plano de recuperação de desastres dos componentes da infra-estrutura tecnológica
16		GSI-20	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter o plano de acções a tomar no período de recuperação de desastres
17		GSI-21	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter o plano de instruções e procedimentos das operações nos componentes da infra-estrutura
18		GSI-22	GSI - Gestão dos Sistemas de Informação	DSSI - Disponibilização e Suporte dos SI	Definir e manter o escalonamento das tarefas de controlo e monitorização dos componentes da infra-

Disponível o Relatório da Auditoria de Concessão [15.12.2008]

Nova versão da FICHA DE OCORRÊNCIAS [08.12.2008]

Nova versão do Procedimento Acções Correctivas e Preventivas [08.12.2008]

Estão disponíveis os resultados dos Inquéritos de Satisfação dos Colaboradores. [ver mais] [13.11.2008]

Fig. 3 – Web Site to support the Quality Management System of the IPVC [33].

Considering the evolution of society and laws, the IPVC implemented a Quality Management System (QMS) that allowed to ensure the ISO 9000 certification. The QMS covers the activities of the IPVC Strategic Planning and Management, Education/Training and support. This QMS (according with the ISO 9001 standard specification) is composed by Academic, Environment, Health and Safety, Social Services, Courses Creation/Restructuration, Training, Economic-financial management (Supply, Accounting and Treasury and State Property), 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 (Library, Educational Spaces). The existing structure before the implementation of the QMS indicates differences in the way of some operational activities, especially those common to all schools. The knowledge of how each school does not always allow an overall management of the available information, requiring the increased use of resources and unnecessary loss of time. There was a clear need to provide a team of employees from various schools in line with the central departments of the Polytechnic Institute, to rethink the management model.

Several limitations and difficulties were encountered to implement and use the QMS as: improving the qualifications of the care of administrative services in a logical combination of proximity criteria with the rationalization of structures, the difficulty in integrating cross-administrative services and the provision information, the difficulty of distance processes, the requirement and need for completion and circulation of documents in paper format for monitoring the trend of administrative processes, the need for delivery of these documents in the presence of administrative services schools, the existence of several information systems dispersed (not integrated with each other), the difficulty of monitoring the services performance, the use of documents in paper format to make the assessment of quality of service, space management and equipment be made through printed on paper without effective control to access the same spaces and the need to incur high financial resources guarantee security personnel of these spaces.

Each school has an organic set of IS secured and managed by the Information Department (ID) of each Organic Unit. With the development and implementation of improved infrastructure (fiber optic), the interconnection between the various services have been centralized (e.g. academics, human resources, accounting, etc.) but nevertheless there are a several IS managed by the ID in each Organic Unit. The local management of IS until the applicability of COBIT 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 evolution of IS and IT, the study of the ISO 9001 implementation in the IT field (case Information Systems Management process in the IPVC QMS) was examined and discussed internally. The implementation of the ISO 9001 standard should follow two guidelines: in one hand ensure the ISO 9001 certification and the other, develop work to manage and control the IT and create mechanisms to ensure certification in other standards (e.g. security standard ISO 27000 [17]).

4.2 Information Systems Management Process Implementation

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 field was the "Information Systems Management" Process (ISMP) and it was elaborated tends as base the COBIT.

After the examination of the various standards and frameworks [1] [2] [3] [4] [5] [6] 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 [26] [32]. For this reason and considering the work analysis it was decided to implement it in the IPVC especially in the IS and IT field. 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: GSI-Number for the procedures and GSI/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. The COBIT is divided into four domains and each area 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 Management Information System process of the four COBIT domains, and for each sub-process consider the activities from the subset of control objectives of COBIT. Each activity of the COBIT control objectives was mapped in the procedures of each sub-process activity.

4.2.1 Structure of the ISO 9001 sub-processes and COBIT domains

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. As 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 output is 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 the objectives.

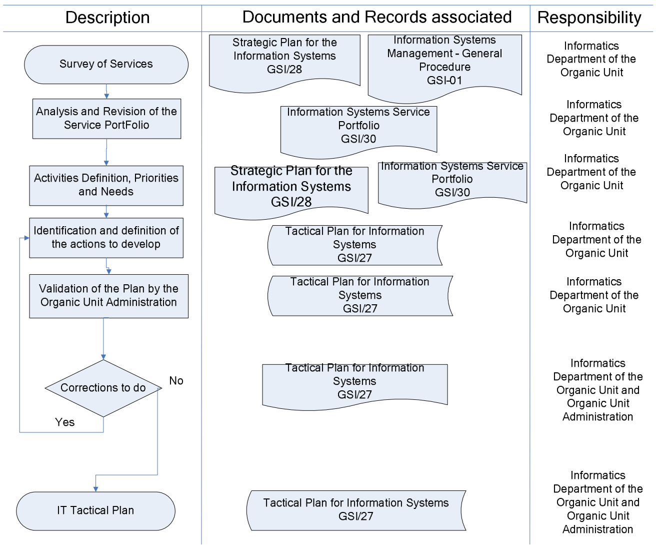

Description
Documents and Records associated
Responsibility
Survey of Services
Strategic Plan for the Information Systems GSI/28
Information Systems Management - General Procedure GSI-01
Informatics Department of the Organic Unit
Analysis and Revision of the Service PortFolio
Information Systems Service Portfolio GSI/30
Informatics Department of the Organic Unit
Activities Definition, Priorities and Needs
Strategic Plan for the Information Systems GSI/28
Information Systems Service Portfolio GSI/30
Informatics Department of the Organic Unit
Identification and definition of the actions to develop
Tactical Plan for Information Systems GSI/27
Informatics Department of the Organic Unit
Validation of the Plan by the Organic Unit Administration
Tactical Plan for Information Systems GSI/27
Informatics Department of the Organic Unit
Corrections to do
No
Yes
Tactical Plan for Information Systems GSI/27
Informatics Department of the Organic Unit and Organic Unit Administration
IT Tactical Plan
Tactical Plan for Information Systems GSI/27
Informatics Department of the Organic Unit and Organic Unit Administration

Figure 4 – Procedure to elaborate a tactical plan for Information Technology.

According to the specification of the ISO 9000 standard 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 4 presents a procedure for drawing up a tactical plan for IT. Based on the strategic plan for IT in the services portfolio it will be drawn up the annual IT tactical plan. Based on this tactical plan it will the made the IT portfolio services. The start of this procedure is the survey of services based with the strategic plan for IS with the responsibility of the ID of the IPVC Organic Unit. With this strategic plan for IS the ID will analyze and review the IS services portfolio document. With the strategic for IS and the IS services portfolio the ID will record the activities and the definition of IT priorities. With this information and with the identification and definition of the actions to develop it will be made the tactical plan. This tactical plan will be evaluated and approved by the ID and by the Organic Unit Administration. If it will be approved the IT tactical plan will be published and prepared to be used. If not it will be analyzed the corrections to be done and follow the identification and definition of the actions to develop. 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.

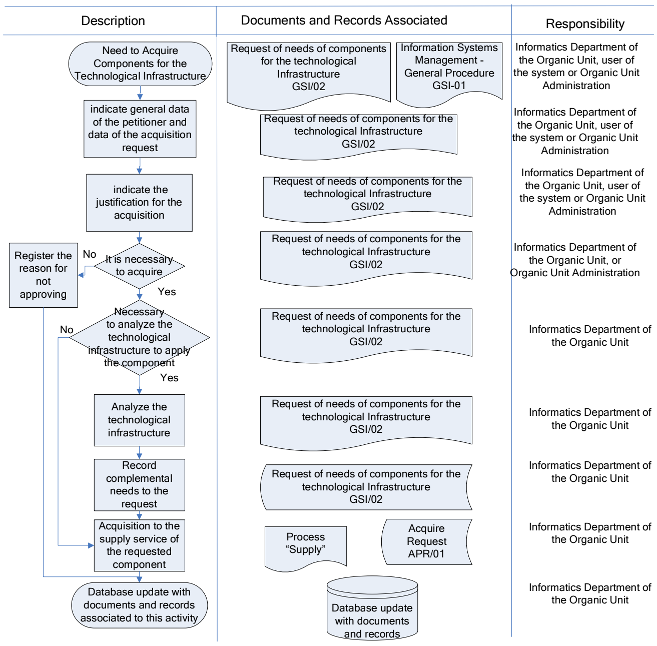

Description
Documents and Records Associated
Responsibility
Need to Acquire Components for the Technological Infrastructure
Request of needs of components for the technological Infrastructure GSI/02
Information Systems Management - General Procedure GSI-01
Informatics Department of the Organic Unit, user of the system or Organic Unit Administration
indicate general data of the petitioner and data of the acquisition request
Request of needs of components for the technological Infrastructure GSI/02
Informatics Department of the Organic Unit, user of the system or Organic Unit Administration
indicate the justification for the acquisition
Request of needs of components for the technological Infrastructure GSI/02
Informatics Department of the Organic Unit, user of the system or Organic Unit Administration
Register the reason for not approving
No
It is necessary to acquire
Yes
Request of needs of components for the technological Infrastructure GSI/02
Informatics Department of the Organic Unit, or Organic Unit Administration
No
Necessary to analyze the technological Infrastructure to apply the component
Yes
Request of needs of components for the technological Infrastructure GSI/02
Informatics Department of the Organic Unit
Analyze the technological infrastructure
Request of needs of components for the technological Infrastructure GSI/02
Informatics Department of the Organic Unit
Record complemental needs to the request
Request of needs of components for the technological Infrastructure GSI/02
Informatics Department of the Organic Unit
Acquisition to the supply service of the requested component
Process "Supply"
Acquire Request APR/01
Informatics Department of the Organic Unit
Database update with documents and records associated to this activity
Database update with documents and records
Informatics Department of the Organic Unit

Fig. 5 – Procedure to acquire components for the technological infrastructure

The objective of the procedure presented in the figure 5 is to define the steps in order to acquire components for the technological infrastructure. The procedure begins with the application to request the needs of components for the technological infrastructure where the Organic Unit ID, or the user of the system. One of these entities indicates the acquisition date request and indicates the justification for the acquisition. Next the ID or the Organic Unit Administration will analyze if it real necessary to acquire the component. If not they will register the reason for not approving the request and the database is updated with documents and records associated to this activity (in this step in the request form). If it is necessary, they will analyze if it is necessary to analyze the technological infrastructure to apply the component. If it is not necessary the ID will proceed with the acquisition to the supply service (IPVC QMS sub-process) of the requested component. If it is necessary they will analyze the technological infrastructure, record complementally needs to the request and proceed with the acquisition to the supply service of the requested component (and the additional needs). For this step the ID will record the form “Acquire Request” of the sub-process “Supply”. After this, the Organic Unit ID will update the database with the documents and records associated to this activity.

c) Deliver and Support of the Information Systems

This sub-process (domain of COBIT) defines procedures to make available for the IS for the 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 stagger of the operations associated to the technological infrastructure components, as for instance, to define the stagger to realize backups, backup restoring, test and evaluate the security, the continuity and the performance of the IT components.

In the figure 6 we present the procedure to solve informatics incidents. The start of this activity is dispoleted by the request for Informatics incidents where the user complete the “Occurrence of Informatics Incident” form. This action is responsible by the IT user, or by the procedure that request the resolution of incidents. When the request is received the IPVC Organic Unit ID send an e-mail for the user with the receipt of the information. After that the ID proceeds with the identification of the problem. If the ID can resolve the problem it will be analyze if it is necessary to involve another components to resolve the problem. If the ID can’t resolve the problem, then they will record the justification in the request, send an e-mail to the entity that requests the incident and the QMS database is updated with documents and records associated to this activity. If it is necessary to acquire components the ID will follow the procedure “Acquire components for the technological infrastructure” in order to acquire the necessary material to resolve the incident. If it not involves the application of material (or the material is yet available) they will check if it is necessary to install or configure the components of the technological infra-structure. If not they will proceed with the resolution and act in concordance. If it is necessary they will follow the guidelines defined by the procedure “Install, reinstall and configure components in the technological infrastructure”. If the problem was resolved the QMS database is updated with documents and records associated to this activity. If not it will be record the justification in the request form and it will analyzed if the he ID can resolve the problem and follow the same steps of this procedure.

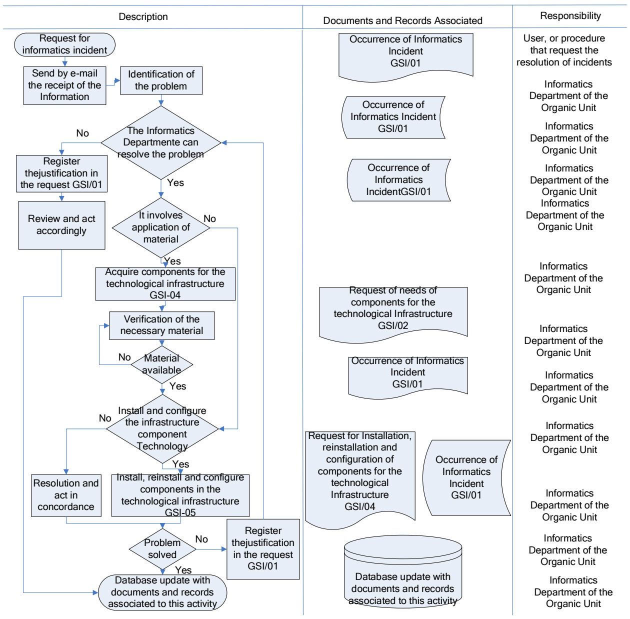

Description
Documents and Records Associated
Responsibility
Request for informatics incident
Send by e-mail the receipt of the Information
Identification of the problem
No
The Informatics Department can resolve the problem
Register thejustification in the request GSI/01
Yes
Review and act accordingly
It involves application of material
No
Yes
Acquire components for the technological infrastructure GSI-04
Verification of the necessary material
No
Material available
Yes
No
Install and configure the infrastructure component Technology
Yes
Resolution and act in concordance
Install, reinstall and configure components in the technological infrastructure GSI-05
Problem solved
No
Register thejustification in the request GSI/01
Yes
Database update with documents and records associated to this activity
Occurrence of Informatics Incident GSI/01
Occurrence of Informatics Incident GSI/01
Occurrence of Informatics IncidentGSI/01
Request of needs of components for the technological Infrastructure GSI/02
Occurrence of Informatics Incident GSI/01
Request for Installation, reinstallation and configuration of components for the technological Infrastructure GSI/04
Occurrence of Informatics Incident GSI/01
Database update with documents and records associated to this activity
User, or procedure that request the resolution of incidents
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit

Fig. 6 – Procedure to Solve Informatics Incidents

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 safety and the readiness 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.

In the figure 7 we present the procedure to monitor and control the components of the technological infraestructure. The start of this procedure is made by the ID or by the Organic Unit Administration or by the schedule of the document “Task Scheduler Plan to monitor and control the technological Infrastructure components”. With the request or by the schedule the ID will analyze the document of the software listing and components susceptible to be controlled and monitored, will analyze the task scheduler and analyze instructions and procedures to act (document “Intervention plan in the technological infrastructure components”). With this examination they will execute the procedures: “Monitor and evaluate the performance and capacity of the technological infrastructure components” and “Test and monitor the security of the technological infrastructure components”. Each procedure has its own pattern and record of monitoring reports. In the end of the execution of the procedures the database is updated with the documents and records associated to this activity.

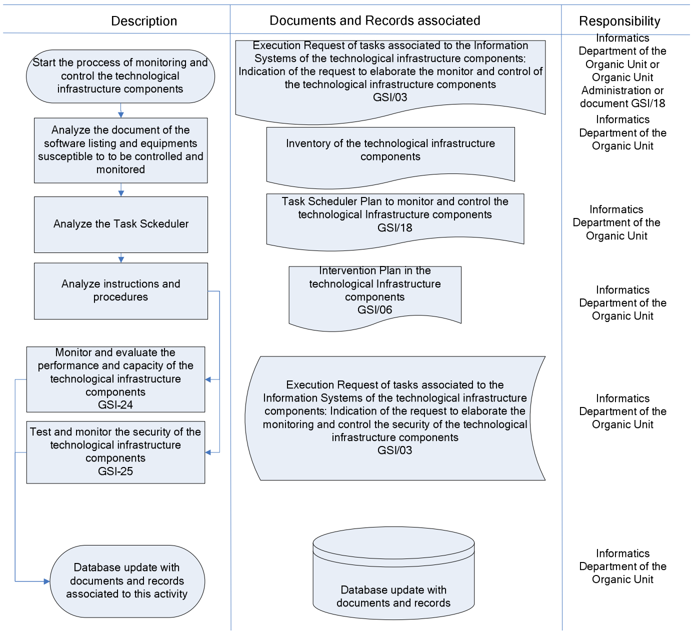
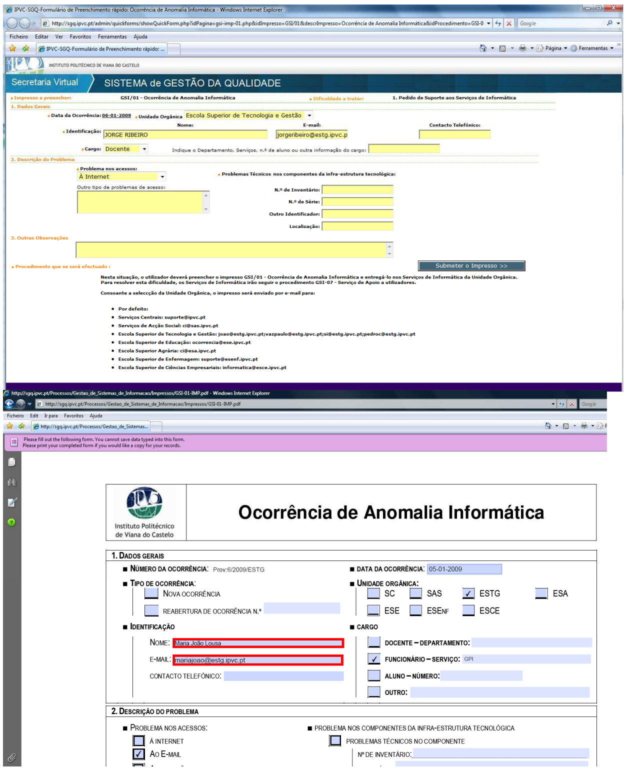

Description
Documents and Records associated
Responsibility
Start the proccess of monitoring and control the technological infrastructure components
Analyze the document of the software listing and equipments susceptible to be controlled and monitored
Analyze the Task Sckeduler
Analyze instructions and procedures
Monitor and evaluate the performance and capacity of the technological infrastructure components GSI-24
Test and monitor the security of the technological infrastructure components GSI-25
Database update with documents and records associated to this activity
Execution Request of tasks associated to the Information Systems of the technological infrastructure components: Indication of the request to elaborate the monitor and control of the technological infrastructure components GSI/03
Inventory of the technological infrastructure components
Task Scheduler Plan to monitor and control the technological Infrastructure components GSI/18
Intervention Plan in the technological Infrastructure components GSI/06
Execution Request of tasks associated to the Information Systems of the technological infrastructure components: Indication of the request to elaborate the monitoring and control the security of the technological infrastructure components GSI/03
Database update with documents and records
Informatics Department of the Organic Unit or Organic Unit Administration or document GSI/18
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit
Informatics Department of the Organic Unit

Fig. 7 – Procedure to monitor and control the components of the infra-struture

As we mentioned the existing structure before the implementation of the IPVC Quality Management System, indicates differences in the way of some operational activities, especially those common to all schools. Many difficulties were encountered: a lot of time to access to the correct forms and procedures to perform a task; registration of forms in paper format, difficulty in monitoring the services and difficulty in completing the forms. To try to bridge some of the difficulties the IPVC developed an information system (called the Virtual Secretariat to support the QMS) that provides a quick and easy way to access to all the documentation, automatic generation of forms, scheduling of requests to be processed and monitoring the service performance.

However, despite the advantages of using this tool there is many limitations that are not yet implemented. The operation of request support to the ID and the automatic generation of the form bases on QAS are presented in figure 8. This tool helps in one hand to access quickly to the QMS documentation and in other and helps the administration to monitor the service performance of the ID quality of services. This is achieved through the provision of forms in digital format that allows the automatic generation of documents (facilitating the completion of forms by users) and other permit the storage of the records in a database.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2. Descrição do Problema

Problema nos acessos: À Internet
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Problemas Técnicos nos componentes da infra-estrutura tecnológica:
N.º de Inventário:
N.º de Série:
Outro Identificador:
Localização:

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■ Tipo de ocorrência: □ Nova ocorrência □ Reabertura de ocorrência n.º
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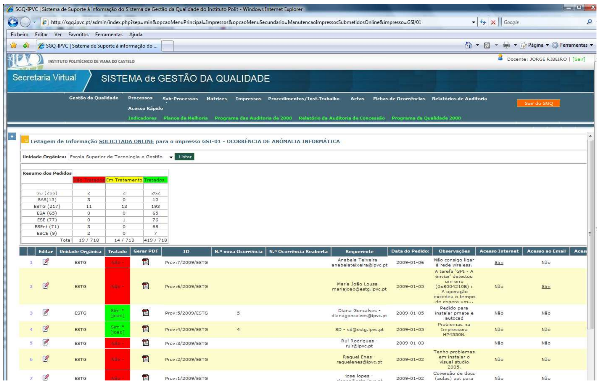
■ Cargo: □ Docente – Departamento: ☑ Funcionário – Serviço: GPI □ Aluno – Número: □ Outro:

2. Descrição do problema

■ Problema nos acessos: □ À Internet ☑ Ao E-mail
■ Problema nos componentes da infra-estrutura tecnológica: □ Problemas técnicos no componente Nº de inventário:

Fig. 8 – Web form and based Quality System form generated automatically

For the analysis of efficiency and control of IT it is necessary records. The QMS of the scheme provides a set of operations (figure 8 and 9) for improving the feasibility of trigger procedures. Some examples are the generation of applications for execution of tasks, support requests, and request for installation and application installation, configuration and reconfiguration of software in laboratories or in the Organic Units of computer services.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Programa da Qualidade 2008

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	Não Tratados	Em Tratamento	Tratados
SC (266)	2	2	262
SAS(13)	3	0	10
ESTG (217)	11	13	193
ESA (65)	0	0	65
ESE (77)	0	1	76
ESEnf (71)	3	0	68
ESCE (9)	2	0	7
Total	19 / 718	14 / 718	419 / 718

	Editar	Unidade Orgânica	Tratado	Gerar PDF	ID	N.º nova Ocorrência	N.º Ocorrência Reaberta	Requerente	Data do Pedido:	Observações	Acesso Internet	Acesso ao Email	Aces
1		ESTG	Não -		Prov:7/2009/ESTG			Anabela Teixeira - anabelateixeira@ipvc.pt	2009-01-06	Não consigo ligar à rede wireless.	Sim	Não	
2		ESTG	Não -		Prov:6/2009/ESTG			Maria João Lousa - mariajoao@estg.ipvc.pt	2009-01-05	A tarefa 'GPI - A enviar' detectou um erro (0x8004210B) : 'A operação excedeu o tempo de espera um...	Não	Sim	
3		ESTG	Sim * [joao]		Prov:5/2009/ESTG	5		Diana Goncalves - dianagoncalves@ipvc.pt	2009-01-05	Pedido para instalar pmate e autocad	Não	Não	
4		ESTG	Sim * [joao]		Prov:4/2009/ESTG	4		SD - sd@estg.ipvc.pt	2009-01-05	Problemas na Impressora HP4550N.	Não	Não	
5		ESTG	Não -		Prov:3/2009/ESTG			Rui Rodrigues - ruir@ipvc.pt	2009-01-03		Não	Não	
6		ESTG	Não -		Prov:2/2009/ESTG			Raquel Enes - raquelenes@ipvc.pt	2009-01-02	Tenho problemas em instalar o visual studio 2005.	Não	Não	
7		ESTG	Não -		Prov:1/2009/ESTG			jose lopes -	2009-01-02	Coversão de docs (aulas) ppt para	Não	Não	

Fig. 9 – Support system for receiving and processing requests from users of the Information Technologies field

Currently the IPVC does not have yet a procedural workflow system to support the QMS (it is in development). However, it was developed with this Virtual Secretariat some operations and features that allows automatic analysis of the indicators defined for the process of Management Information Systems (as defined by COBIT).

4.2.2 IT Governance of Information System Management Process

The COBIT presents a set of indicators that cover all areas of IT for IT Governance. As is easy to understand, these indicators can be used in various types of organizations.

a) Indicators

An organization and specially in the high public education field and according to the reality on the context the indicators of COBIT were selected in detail and used a subset. The indicators are: Indicator 1 - Number of requests for support from its users caused by inadequate training; Indicator 2 - Number of annual events by the application of software for servers that caused losses of operation; Indicator 3 - Average time (days) in response to the recovery of the component of the technological infrastructure without purchasing components; Indicator 4 - Rate of incidents that require support in place (outside the Information Technology Services) of the occurrence; Indicator 5 - Rate of incidents resolved and finalized the responsibility of Information Technology Services; Indicator 6 - Rate of incidents reopened; Indicator 7 - Rate of backups of critical data (defined by the policy of backups) and Indicator 8 - Rate of successful tests of the backups of the data from Information Systems. The frequency of monitoring (or mesaure Time) and the objective to be achieved for each objectives is shown in table 1. Despite being a small number of indicators another set of indicators 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 functionsand application down time or data fixes caused by inadequate testing).

We also monitored the satisfaction levels and formation associated associated with the clients/users of this process (ex: % of users satisfied with functionality delivered, training days per IT employee per year related to compliance, % of board members trained in or having experience with IT governance, level of training attendance of users and operators for each application, % of stakeholders satisfied with data integrity of new systems, etc) but are processed and analyzed in the IPVC QMS "observatory" process. The same treatment is done for the IT suppliers (ex: % of major suppliers subject to monitoring, Level of business satisfaction with effectiveness of communication from the supplier, # of formal disputes with suppliers, etc).

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	< util 4 days	Year
4	(Total incidents that require local support/Total of Incidents)*100	< 50%	Year
5	(Events resolved and finalized / Total incidents finalized)*100	> 60%	Year
6	(Total incidents reopened /Total of incidents)*100	< 20%	Year
7	(Number of critical data backups / Total of critical data)*100	> 90 %	Month
8	(Number of tests performed backups / Total number of backups performed)*100	> 90 %	Month

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

b) Monitoring Indicators

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. In 2007 there wasn't still no implemented 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 the charts (figure 9 and 10) we divided the indicators and each one will be compared with the same periods of the year 2007.

In Figure 9 we present the results of comparative indicators 1 and 2 in 2007 without using the COBIT and in 2008 using the COBIT. How can we check 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 . The fact is that with the implementation of COBIT guidelines and various strategic mechanisms were made by one side to ensure a better level of users training, and define more efficient control mechanisms to monitor and control the components of the technological infrastructure. There is an improvement in these indicators of about 15% for 2007 (without using COBIT) to 2008 (using the COBIT).

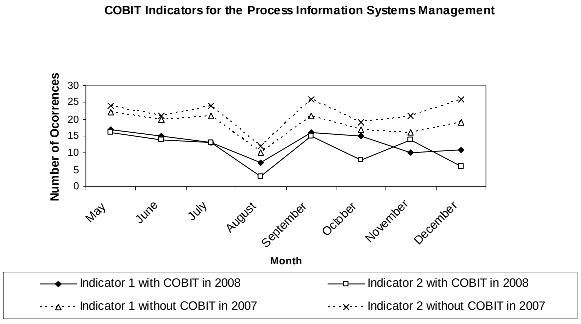

Figure 9 – Comparison of Indicators 1 and 2 in 2008 and 2007 without using COBIT using COBIT.

For the indicator of the average time (days) in response to the recovery of the technological infrastructure component without purchasing of components in 2007 (with COBIT implementation) and 2008 (with COBIT implementation) the values are found in Table 2.

Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	0,2	0,23	0,21	0,18	1,2	1,3	0,61	0,38
2007	2,1	1,9	1,6	1,1	2,4	2,2	2,6	1,8
Avg	1,15	1,065	0,90	0,64	1,8	1,75	1,6	1,09

Table 2 – Comparison (in days) of Indicator 3 in 2008 using COBIT and 2007 without using COBIT.

The number of days to reply, 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 guidelines of COBIT. In figure 10 we show the results of indicators 4, 5 and 6. The rate of incidents that require support in place (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 improved efficiency of the installation type, configuration and maintenance of the components in its first use and regular maintenance.

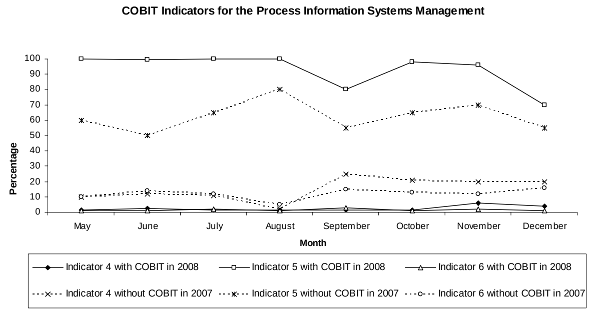

Figure 10 – Comparison of the indicators 4, 5 and 6.

The rate of incidents resolved and finalized the responsibility of ID services (indicator 5) improved compared to 2007 by 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 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
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 3 – Comparison (in Percentage) of Indicators 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 (the I7 mentioned in the table 3) and the rate of successful tests of the data from the backups Information Systems - Indicator (I8 those mentioned in the table 3) is 100%. This is due to the implementation 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 and were limited compared to 2008 (with the implementation of COBIT) achieved an improvement of about 10% over the previous year mainly because the conditions of equipment geared to that end.

5 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. 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, 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. With the implementation of COBIT the institution has improved the quality of care by the administrative services, controlled and managed the IS more efficiently, defining processes and indicators to do it, reduced the tasks execution time, reduced in 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, 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. However some issues must be guaranteed like: the need for continuous training on the COBIT especially for those collaborators with less receptive to the change process and 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. In summary we conclude that 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.

References:

[1] International Organization for Standardization, ISO/IEC 20000-1 & ISO/IEC 20000-2, 2005- http:// www.iso.org/

[2] R.S. Debraceny, “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, 2006.

[3] OGC, "Official Introduction to the Itil Service Lifecycle", Stationery Office, Office of Government Commerce, 2007.

[4] Official Site of COSO- Committee of Sponsoring Organizations: http://www.coso.org/

[5] Official Site of Project Management Institute that define the PMBok Guide: http://www.pmi.org

[6] COBIT, “Information Systems Audit and Control Association, Control Objectives for Information and Related Technology, 4.1:th Edition, IT Governance Institute, 2007

[7] M. Simonsson and P. Johnson, “Model-based IT governance maturity assessments with COBIT”, In proceedings of the European Conference on Information Systems, St. Gallen, Switzerland, 2007

[8] M. Holm Larsen, M. Kühn Pedersen and K. Viborg Andersen, “IT Governance – Reviewing 17 IT Governance Tools and Analyzing the Case of Novozymes A/S”, Proceedings of the 39th Hawaii International Conference on System Sciences, 2006

[9] Simonsson, Johnson, P. “The IT organization modeling and assessment tool: Correlating IT governance maturity with the effect of IT”. In Proceedings of the 41st Hawaii International Conference on System Sciences, 2008.

[10] C., Tsiakals, J., West, J., West, J. "Iso 9001: 2000 Explained". ASQC/Quality Press, 2000.

[11] N. Korac-Kakabadse and A. Kakabadse, ”IS/IT Governance: Need For an Integrated Model”. Corporate Governance Journal, volume 1, pages:9-11, 2001.

[12] Weill, P. and J.W. Ross, IT governance – How Top Performers Manage IT Decision Rights for Superior Results. Harvard Business School Press, 2004.

[13] van Grembergen, W., S. De Haes and E. Guldentops “Structures, Processes and Relational Mechanisms for IT Governance”, In: Van Grembergen, W. (ed.): Strategies for Information Technology Governance. Idea Group Publishing, 2004.

[14] Official Site of ITIL - Information Technology Infrastructure Library: http://www.itil-officialsite.com

[15] Sharon Taylor, M.Iqbal, M.Nieves, “ITIL:Service Strategy”, TSO publications.Norwith,UK,2007

[16] ISO 17799 - http://www.iso.org/iso/support/faqs/faqs_widely_used_standards/widely_used_standards_other/information_security.htm

[17] Accessed in 12-01-2009.

[18] Calder, A., Bon, J. "Information Security Based on ISO 27001/ISO 17799: A Management Guide", Van Haren Publishing, 2006.

[19] British Standards Institution - http://www.bsi-global.com/

[20] Paulk, M., Weber, C., Curtis, B., Chrissis, M. "The Capability Maturity Model: Guidelines for Improving the Software Process (SEI Series in Software Engineering), Addison-Wesley Professional, 1995.

[21] SW-CMM - http://www.sei.cmu.edu/appraisal-program/profile/sw-cmm.html

Accessed in 12-01-2009

[22] SEI (Software Engineering Institute) – http:// www.sei.cmu.edu/

Accessed in 12-01.2009

[23] Moeller, R., “COSO Enterprise Risk Management: Understanding the New Integrated ERM Framework”, John Wiley and Son, 2007.

[24] PMI, (2008), "A Guide to the Project Management Body of Knowledge", Project Management Institute.

[25] Kaplan R., and Norton D., Balanced Scorecard: Translating Strategy Into Action (Hardcover), Boston: Harvard Business School Press, 2004.

[26] Pande, P., Holpp, L., "What Is Six Sigma?", McGraw-Hill, 2001.

[27] G. Ridley, J. Young and P. Carroll, “COBIT and its utilization - A framework from the literature”, Proceedings of the 37th Hawaii International Conference on System Sciences, Hawaii, 2004

[28] Official site of the IT Governance Institute: http:// www.itgi.org/

[29] The Official Site of Information Systems Audit and Control Association – ISACA: hpp:// www.isaca.org/

[30] Hussain, S., Siddiqui, M. Quantified Model of COBIT for Corporate IT Governance. In Proccedings of the First International Conference on Information and Communication Technologies, 2005.

[31] Sahibudin, S., Sharifi, M and Ayat, M. Conbining ITIL, COBIT and ISO/IEC 27002 in Order to Design a Comprehensive IT Framework in Organizations. In Proccedings of the Second Asia International Conference on Modelling & Simulation, 2008.

[32] The Viana do Castelo Polytechnic Institute (IPVC): http://portal.ipvc.pt/portal/page/portal/ipvc_en

[33] E. Guldentops and S. De Haes, “COBIT 3rd Edition Usage Survey: Growing Acceptance of COBIT”, Information Systems Control Journal, Vol. 6, pp.25-31, 2002.

[34] Web site that supports the Quality Management System of the Politechnic Institute of Viana do Castelo: http://www.sgq.ipvc.pt/publico.html