COBIT FRAMEWORK AS A GUIDELINE OF EFFECTIVE IT GOVERNANCE IN HIGHER EDUCATION: A REVIEW

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ABSTRACT

 With the advent of the increasing and complex pace of Information Technology (IT) innovation, coupled with maximized investments in IT as a strategy for businesses to stay competitive in a volatile market, and executive decision makers should possess effective IT governance. Effective IT governance is viewed as a great mechanism to use information and processes which in turn leads to greater profits and present future benefits. Therefore, good IT governance structures guide organizations in better leveraging their IT spending on crucial business areas. The significance of IT governance affects the ability of the organization to fulfill its goals and IT governance assists in the minimization of risks and maximization of value by focusing on performance and leveraging IT to satisfy the organization's and customer's long-term demands. Currently, organizations are showing interest in adopting the best practices and standards for IT governance. A framework offers the boundaries, the principles to follow and the guidelines through which a vision is provided as a philosophical base and the construction structure. It offers the basic structure that is flexible to apply in a certain environment. Such framework used in this study is COBIT. COBIT offers effective practices throughout a framework and lays down activities in an organized and flexible structure. These practices assist in optimizing IT-enabled investments, guarantee delivery of service and offers protection against who's accountable for the wrongs. This paper focuses on the COBIT framework and the importance of its adoption in academic institution, universities and organizations. Some case studies are selected and analyzed of adopting COBIT framework in higher education institutions. These case studies are Australian Higher Education Institutions, Curtin University of Technology, and Viana do Castelo Polytechnic Institute.

KEYWORDS

Information Technology, IT Governance, COBIT, Higher Education Institutions, Australian Higher Education Institutions, Curtin University of Technology, Viana do Castelo Polytechnic Institute.

1. INTRODUCTION

Information Technology (IT) is the technology that assists enterprises, organizations, and universities to achieve goals more efficiently and to propel the business into new heights right from the first day. IT governance is a process by which the objectives of the entity that give impact on Information technology are agreed, directed, and controlled [1]. IT governance facilitates an efficient organization and opens opportunities for the organization to achieve competitive advantage [2]. Effective IT governance is responsible for distributing the decision making to the individuals that are best qualified to be privy to the needs of the organization and the implications of these needs [3].

Nowadays, organizations and higher education institutions take advantage of technology in the development, management and transaction of intangible assets including knowledge and information [4][5].

For universities, IT has become critical in all aspects such as teaching, researching and administration. IT has become a strategic partner and an effective strategic instrument for most universities and educational institutions [6][7]. IT governance in these institutions acts as guide and control. It is noteworthy that the effective employment and execution of IT governance enables the universities to gain the following positive outcome: (i) higher degree of success in aligning IT and business goals, (ii) effectual utilization of IT resources, and (iii) IT risk management [8].

Presently, organizations and universities are showing interest in adopting the best practices and standards for IT governance because these frameworks consider as a guidelines and it provides the basic structure that is flexible to apply in a certain environment. One of these adopted frameworks is Control Objectives for Information and Related Technology (COBIT) [9].

2. IT GOVERNANCE

IT governance is basically concerned with the way IT delivers value and it's the management of the risks associated with it which can be brought about through the strategic alignment of business and IT, resource management and performance management [10][11]. Moreover, IT governance was acknowledged as significant, as evidenced by the statement, "An effective IT governance structure is the single most important predictor of getting value from IT" [12][13].

The necessity of IT governance lies in the investment of the average enterprise on IT. Since IT governance consumes time, work and attention, it requires motivation. Some of the reasons underlying the implementation of effective IT governance include; effective IT governance gives back as IT governance does not only impact the outcome but it also comes with good management and; effective IT governance requires expensive investments and hence, it is imperative to focus on strategic priorities. Currently, IT investments are conducted throughout the organization. [3][14].

In addition, there is an evident need of IT use in all levels of the organization. It is also clear that successful organizations govern their IT processes distinct from those that are less successful. This calls for a reevaluation of IT governance through the development of a vision; a process encapsulating making the right decisions, assessment and management of risks and encouraging accurate and transparent accountabilities and good behaviour [3].

Furthermore, IT governance keeps track of the organization's reliance of IT and the importance of IT in business strategies. In other words, businesses owe their successes to IT because IT supports and facilitates the achievement of organization objectives. It is a strategy for innovation and business development, and IT implications regarding mergers and acquisitions calls for due diligence [15].

3. IT GOVERNANCE in HIGHER EDUCATION

Throughout the world, most of the universities have employed Information Technology (IT) for managing their educational and administrative activities. Nevertheless, these universities have to focus on encapsulating IT as part of their strategy. Furthermore, for the purpose of achieving the objectives of the universities, to improve their competitiveness and effectiveness, it is crucial to establish strategic objectives and to make the appropriate decisions in terms of investing on IT.

As mentioned above, IT significantly supports all main services of universities; moreover, IT will become a strategic tool for all universities [6].

The institutional processes are very imperative for any university to effectively execute its research, administration, and teaching activities. In terms of IT governance in universities, it guides at the planning and the functional levels of these institutional processes.

Educause Center for Applied Research (ECAR) claims that, despite the development of ideology and procedures in terms of IT governance for business organizations, many higher education institutes have shown huge interest in implementing these ideologies to the management of IT. ECAR has published a complete survey report of IT governance practices at universities. The aim of the survey was regarding "information about the state of higher education IT governance and to identify practices associated with good IT governance outcomes" [16].

ECAR has concluded that "effectively harnessing the creative power of the campus community though an enlightened combination of process and politics may be higher education's best chance to advance a proud tradition of innovation and service" [16].

4. COBIT FRAMEWORK

The Model of Control Objectives for Information and Related Technology (COBIT) offers effective practices throughout a framework and lays down activities in an organized and flexible structure [2].

COBIT enables managers to fill the gap for control of the technical issues, business risks and requirements, and shift the control level to stakeholders. This framework allows the creation of IT control policies and best practice across business levels. It constantly updates and harmonizes other standards and guidance. Therefore, it is known to integrate these good practices and framework encapsulating IT governance and to help in comprehending and controlling the risks and benefits related with IT. COBIT framework assists firms in tackling the current challenges in the business arena by: relating to the requirements of business, IT activities are organized in an acceptable process form, determining the main IT resources to be utilized, and identifying the objectives of management control to be considered [2][17].

COBIT framework focuses on helping to achieve the organization requirements to present the information, it assist to manage and control the resources of IT by a structured set of processes to provide information technology services that deliver the required information for the organization. Figure 1 illustrates the COBIT framework principle [2].
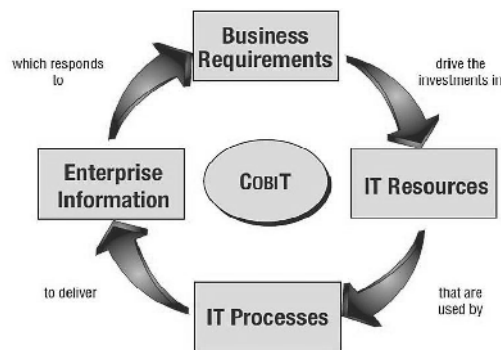

Figure1. COBIT framework principle [2]

On the basis of COBIT 4.1, the framework's orientation is to relate business goals to IT goals, offering metrics and maturity models for the measurement of achievement and for the identification of the related responsibilities of business and owners of IT process. COBIT categorizes IT into four domains; namely Plan and Organize (PO), Acquire and Implement Automated Solutions (AI), Deliver and Support (DS), and Monitor and Evaluate (ME), 34 high-level processes and encapsulates many control objectives. Figure 2, presents the four domains along with the 34 high-level processes with each process subdividing into many varying activities and the connection between the processes is brought about through documents and relations [1][2].
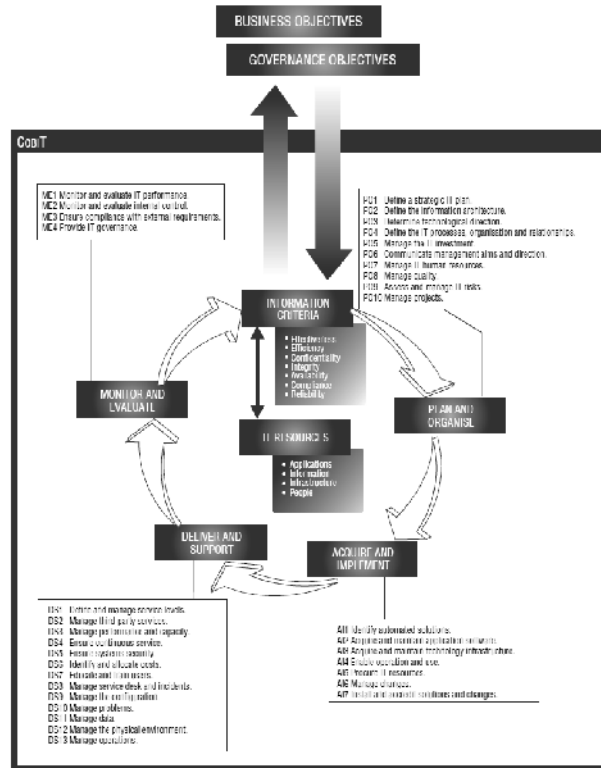

Figure2. Overall COBIT framework [2]

5. INFORMATION CRITERIA OF COBIT

In order to achieve business objectives, certain conditions have to be adhered to known as business requirements for information. On the basis of a generic quality, fiduciary and security needs, the seven specific, co-ordinating information conditions are explained as follows [2]:

Effectiveness "deals with information being relevant and pertinent to the business process as well as being delivered in a timely, correct, consistent and usable manner".

Efficiency "concerns the provision of information through the optimal (most productive and economical) use of resources".

Confidentiality "concerns the protection of sensitive information from unauthorized disclosure".

Integrity "relates to the accuracy and completeness of information as well as to its validity in accordance with business values and expectations".

Availability "relates to information being available when required by the business process now and in the future. It also concerns the safeguarding of necessary resources and associated capabilities".

Compliance "deals with complying with the laws, regulations and contractual arrangements to which the business process is subject, i.e., externally imposed business criteria as well as internal policies".

Reliability "relates to the provision of appropriate information for management to operate the entity and exercise its fiduciary and governance responsibilities".

In order to achieve the objectives of the enterprise, it needs to gather the necessary information to organize and manage IT resources through an organized group of processes, which in turn will presents the services to deliver the information for the enterprise. The COBIT framework's goal is to manage and control information and to assist in aligning them to business needs [2].

6. IT RESOURCES

For an effective response to IT business requirements, the organization has to invest in resources. COBIT contains four IT related resources that are suitable within the IT processes as shown in Figure 3 [1][2]:

Applications "are the automated user systems and manual procedures that process the information".

Information "is the data, in all their forms, input, processed and output by the information systems in whatever form is used by the business".

Infrastructure "is the technology and facilities (i.e., hardware, operating systems, database management systems, networking, multimedia, and the environment that houses and supports them) that enable the processing of the applications".

People "are the personnel required to plan, organize, acquire, implement, deliver, support, monitor and evaluate the information systems and services. They may be internal, outsourced or contracted as required".
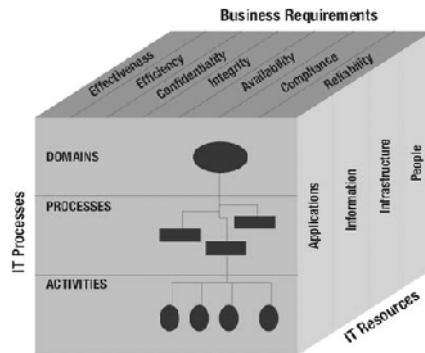

Figure3. The COBIT cube [2]

7. COBIT CONTROL OBJECTIVES

According to COBIT, control objectives are referred as "The policies, procedures, practices, and organizational structures designed to provide reasonable assurance that business objectives will be achieved, and that undesired events will be prevented or detected and corrected" [2].

Control objectives exist to assist in building a suitable management and control system into the IT environment and to make sure that a continuous service is provided which can be established through the implementation of several control procedures such writing or testing continuity plans. COBIT has 34 IT process with control objectives listed for each process. Also, COBIT 4.1 management guidelines provide information to measure, control and organize particular IT processes [1][2].

Every process within COBIT has a particular RACI diagram presenting roles related to important process activities. These activities are obtained from the control objectives and have detailed structures. Based on COBIT the RACI charts are specific to organizations and they depend on the firm's hierarchical structure of accountabilities and responsibilities [1][2].

8. COBIT AUDIENCE

There are three main audiences which have use of COBIT and they are depicted in Figure 4[2][18].

Executive and Boards: They need to better understand the importance of IT governance and the issues related to it and their responsibility of its management.

Business and IT management: These are tools that assist in assigning responsibility, measuring performance, benchmarking and addressing capability gaps. With COBIT, answers to the extent of its financial support to govern IT are provided.

Governance, Assurance, Control and Security Professionals: These are the individuals in control of security risks and quality.
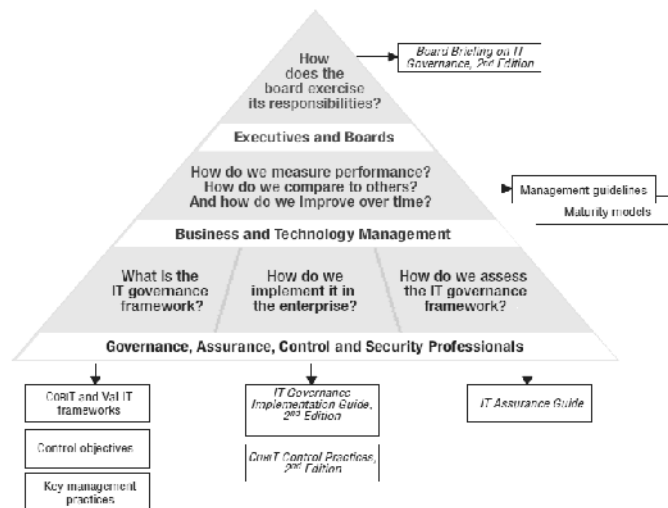
Figure4. COBIT three main audiences [2]

9. CORPORATE ANALYSES of WORKS DONE at UNIVERSITIES

In the present study, some case studies are selected and analyzed of adopting COBIT framework, which is utilized in improving the tasks of information technology at institutions and universities. Three case studies are employed based on the framework from Australian Higher Education Institutions, Curtin University of Technology, and Viana do Castelo Polytechnic Institute[19][20][21]. Table 1, below contains a summary of these case studies that are selected for the present study.

Table1. Summary of three case studies

	Case 1	Case 2	Case 3
	Australian Higher Education Institutions	**Curtin University of Technology**	**Viana do Castelo Polytechnic Institute (IPVC)**
Goals	The main goals are to attain excellence in teaching, learning, research, and development	Reduce the time required for the implementation of its IT governance program, success in achieving its fundamental goals of IT governance-transform organizational practices.	In order to make sure IT governance through effective mechanisms, it is necessary to manage and monitor the information technology.
Framework	The COBIT 3.0 & 4.0 frameworks are implemented for the evaluation of IT processes in the institution. IT governance has also been implemented by both institutions through a combination of structures, processes and relational mechanisms.	The COBIT 4.1 framework is implemented to clarify the confusion existing in the practices that have evolved through the years. It assists employees in understanding and acknowledging that there are enhanced methods of carrying out their missions and responsibilities.	The COBIT4.1 framework is implemented at the institution to guarantee positive outcome of quality services certification and management and control of IS and IT. Consequently, the results were effective.
Findings	• Institution A proceeded with the implementation of COBIT 3.0 to improve individual processes for tackling the requirement for a centralized decision making. Institution B preceded with the implementation of COBIT 4.0 framework to improve process throughout the university as opposed to	• The Information Management Services (IMS) claims that COBIT provides a framework characterized as facilitating economical continuous improvement. • From COBIT, staff can acquire global-standard methods, self-auditing standards, best practices and almost every requirement	• Through the implementation of COBIT at IPVC, the quality care of the administrative services has improved and the IS is efficiently controlled and managed. • COBIT minimized to about 90% the number of communication failures between services and users, and assisted in defining indicators to assess the performance

confining it to central IT.	guiding the university's attempts for process improvement.	of the services in information technology.
• The COBIT implementation in both institutions provided experiences for institutions of the same caliber in the domain of Information Technology.	• COBIT Audit Guidelines allowed the staff to create initial strategies to enhance the audit objectives maturity.	• COBIT enabled the setting of plans and policies to manage IT and reduced the time of task execution by about 25%. Controls and monitoring technological infrastructure components were more efficient.
• In both institutions, the communication enhancement between IT and business has resulted in the increasing acceptance of IT.		• COBIT minimized by 30% the number of incidents resolved and finalized by several IT departments and minimized by over 10% the number of recurring incidents.
• The COBIT framework needs the utilization of an effective project management methodology.		

10. CONCLUSION

This study provides an overview on IT governance, the necessity of IT governance in organizations and Higher Education, COBIT framework and the concepts related to the framework implementation. The study also explains how the COBIT implementations facilitate the reduction of cost in Higher Education. By examining previous studies, the awareness between business and IT is important because it is possible that an organization has all IT governance structures and processes in place. In order to reach effective IT governance, the business and IT should be understand each other. Therefore this research study focuses on the importance of implementing IT governance framework at universities; how alignment between IT units and business strategy will bridge the gap between business management and IT management.

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