Frameworks Used for IT Governance at Universities:
An Exploratory Study

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Abstract

Frameworks are essential to assist the organizations with the implementation of effective IT governance. COBIT and ITIL, among other frameworks, can be considered for the implementation of IT governance. This work uncovers which frameworks and related standards have been adopted to implement the governance of IT at universities. Using a qualitative approach, interviews were carried out with IT directors at universities in three countries: Brazil, Portugal, and the Netherlands. Findings reveal that ITIL is the most used framework with Service Desk and Incident Management as the most implemented processes in the six universities under study. While the Brazilian and the Portuguese universities have adopted ITIL, the Dutch universities preferred to adopt BiSL. Something similar happens for IT project management with Brazilian and Portuguese universities adopting PMBOK while Dutch universities have adopted PRINCE2. Something that is common to all universities under study, it is the option for IS0:27001 regarding information security. Overall, it seems that IT at universities is still focused on operational and managerial issues. The case for the governance of IT is still to be made in order to make clear that IT can play a crucial role to deliver a winning strategy in the business of higher education.

Keywords: IT Governance, Frameworks, Universities

1. Introduction

Organizations have been using IT to perform business processes, integrating customers, distributors and suppliers in order to achieve competitive advantage. In fact, IT is essential to support the growth and sustainability of all types of organizations (De Haes et al., 2013, Wu et al., 2015) and its pervasive use has created a critical dependency on IT which highlights, in particular, the governance of IT (De Haes and Van Grembergen, 2015).

Three types of mechanisms, structure, process and, relational ones, can be considered for decision-making regarding the implementation of IT governance (Grama, 2015) which can impact organizations positively and enhance business/IT alignment (Wu et al., 2015, Juiz and Toomey, 2015). In other words, an adequate combination of these mechanisms is necessary to manage a variety of technologies as well as to support IT-related decisions (Pereira et al., 2014, Wiedenhöft et al., 2017). In addition, as claimed, formal mechanisms at the highest level of the organization for governing IT (Weill and Ross, 2004) (Lunardi et al., 2014), bring benefits and improve organizational performance.

Universities are complex organizations that require adequate information systems to fulfill their mission by running a variety of on premise and cloud applications, on different platforms, to what emerges as a rather heterogeneous technological environment (Wilmore, 2014). This environment should provide the right conditions for teaching and learning, research, and service activities as well as management activities (Coen and Kelly, 2007, Wilmore, 2014, Bianchi et al., 2017). Provided it is an heterogeneous technological environment, it requires appropriate IT governance (Bianchi and

Sousa, 2015, Bianchi and Sousa, 2016) with mechanisms at a high level of maturity (Yanosky and Caruso, 2008) for the effective and efficient use of IT.

The literature shows a variety of frameworks and models to assist the organizations in implementing the governance of IT. A survey carried out by IDC with 225 organizations identified the following adopted frameworks: ITIL (27,1%); Six Sigma (23,6%); ISO 20000 (14,7%); COBIT (12,9%); CMM/CMMI (8%); other (2.2%), None of the above (16%); Don't know (7,1%) where the developing of own models and frameworks accounts for a remarkable 43,6% (Broussard and Tero, 2007).

Another study by Lunardi et al. (2014) in 101 Brazilian organizations identified the following frameworks in use: COBIT (54%), ITIL (44%), SOX (36%), BS7799/ISO17799 (27%), PMI (23%), SLA/SLM (18%), BSC/IT BSC (10%), revealing also a high adoption of own frameworks (32%) and other mechanisms (27%) related to COSO (Committee of Sponsoring Organizations), IT service catalogue, shared domain knowledge, Six Sigma, SOA (Service Oriented Architecture), IT project-linked compensation practices, BPM (Business Process Management) and ISO 9000, among others.

ITIL and COBIT frameworks are pointed out as the two main references used by an organization to implement the governance of IT. Ko and Fink (2010), Selig (2008) and Van Grembergen (2007) argue that ITIL is a framework with the necessary resources to assist the implementation of IT governance and according to Iden and Eikebrokk (2014), a popular driver for that purpose. De Haes et al. (2013) argue that COBIT as a good-practice framework for the enterprise governance of IT. We can find other proposals that, although in the public domain to be used anywhere, have been basically circumscribed to a particular context as it is the case of the Business Information Services Library (BiSL), a standard that is consistent with ITIL and mainly used in The Netherlands (Van der Pols et al., 2012)

There is a lack of studies on IT Governance for specific sectors as it is the case of universities. In fact, the number of universities using frameworks for IT governance is quite limited (Jairak et al., 2015). So, the question is: which of these frameworks and related standards have the universities adopted, if any, to implement IT Governance?

2. Research Background

The literature shows many IT governance frameworks also named as best practices or guidelines to assist the organization in the governance of its information technology. De Haes and Van Grembergen (2008) only cite COBIT. However, the literature shows that the most adopted are ITIL, COBIT and ISO/EIC 38500. ITIL and COBIT are the IT governance frameworks most frequently cited by the companies in the studies of Lunardi et al. (2014).

Frameworks such as COBIT and ITIL, among others, can help firms to monitor and control IT activities and IT services, improving the IT infrastructure and applications efficiency and the quality of internal, external and outsourced IT services. The organizations, that adopt IT governance mechanisms, become more efficient (Lunardi et al., 2014).

We performed a literature review following Creswell (2013)'s criteria to identify studies on IT governance at universities in publications written in English and available in full text from databases such as Web of Science, SCOPUS, AIS eLibrary and EDUCAUSE. Each one of these publications examined the IT governance frameworks implemented and adopted in universities but most of them failed in providing detailed information. Table 1 summarizes the frameworks that have been identified in those studies.

Table 1: Frameworks used in IT Governance at Universities

Frameworks	Studies									
	(Bhattacharjya and Chang, 2006)	(Zhen and Xin-yu, 2007)	(Wan and Chan, 2008)	(Fernández and Llorens, 2009)	(Ribeiro and Gomes, 2009)	(Ko and Fink, 2010)	(Saleh and Almsafir, 2013)	(Nugroho, 2014)	(Bichsel and Feehan, 2014)	(Jairak et al., 2015)
BS 7799/ISO 17799/ISO 27001	x					x			x	
COBIT	x				x	x		x	x	
HEISC (a)									x	
ISO/IEC 38500				x		x		x	x	x
ITIL	x	x	x			x	x		x	
MoR: Management of Risk (International)									x	
OCTAVE (b)									x	
P-CMM (c)	x									
Risk Management Framework (NIST)									x	

(a) HEISC: EDUCAUSE Higher Education Information Security Council Risk Management Framework
(b) OCTAVE: Operationally Critical Threat, Asset, and Vulnerability Evaluation
(c) P-CMM: People Capability Maturity Model

As one can see from the set of frameworks that universities have adopted to implement IT governance, ITIL is the most implemented one in the studies under analysis. Anyway, one can see the adoption of specific frameworks as it is the case of American universities that have adopted HEISC, particularly tailored to their reality (Bichsel and Feehan, 2014). Nevertheless, even if that particular framework is as significant as COBIT regarding the percentage of adoption, ITIL remains the most adopted as reported by the 246 respondents that participated in a survey sent to the members of the EDUCAUSE, the nonprofit association in the United States of IT leaders and professionals committed to advancing higher education.

3. Research Methodology

Few studies attempted to analyze and understand the IT Governance frameworks implemented in the context of universities. This is an exploratory study that adopts an inductive strategy using qualitative data from semi-structured interviews to collect data from different points of view (Myers, 2013) building upon the practical experiences from key stakeholders in the university context (Benbasat et al., 1987) as it is the case of IT Coordinators, Directors or CIOs.

In order to understand the IT governance frameworks implemented in universities, even having adopted a convenience sampling, we selected universities from different contexts with a variation in IT governance structure (federal, centralized), type of control (public, private) and size (extra-large,

medium) to reduce contextual bias (Dubé and Paré, 2003). The QS World University Rankings (QS, 2017) were used, based on Carnegie Classification of Institutions of Higher Education, to classify the universities' size: extra-large for more than 30.000 students; large for more than 12.000 students; medium for more than 5.000 students; and small for less than 5.000 students.

Interviews were conducted with the universities' IT decision-makers at the top and medium management levels (CIO, IT Coordinator and IT Director) usually responsible for all decisions concerning IT (ITGI, 2003). We performed semi-structured interviews in six universities across three countries: Brazil, Portugal and the Netherlands. Table 2 provides some information regarding the interviewees and their institutions.

Table 2: Interviewees

	Country	Struct.	ToC	Position	ExpIT (years)	ExpPos (years)	Interv. (hours)	Size
	(a)	(b)	(c)		(d)	(e)	(f)	(g)
1	BR	F	Pub	IT Coordinator	14-20	4-6	3.0	EL
2	BR	F	Prv	IT Director	14-19	≤ 3	2.5	EL
3	PT	C	Pub	IT Director	20-24	≤ 3	2.0	M
4	PT	C	Pub	IT Director	14-19	≤ 3	1.5	M
5	NL	F	Pub	CIO	≥ 25	≤ 3	1.5	EL
6	NL	C	Pub	CIO	≥ 25	≥ 10	1.5	M

(a) Country: BR (Brazil), PT (Portugal), NL (Netherlands)
(b) IT Governance Structure: F (Federal), C (Centralized)
(c) Type of Control: Pub (Public); Prv (Private)
(d) Experience in IT: years
(e) Experience in the Position: years
(f) Duration of the Interview: hours
(g) Size: E-L (Extra Large, >30.000 students), M (Medium, ≥5.000 students)

Face-to-face interviews were performed in Portugal and in the Netherlands. Skype interviews were performed in Brazil. Interviews were conducted in English in the Netherlands, and in Portuguese in Brazil and Portugal, and were later translated to English. "ECAM call recorder" was used to record the interviews on Skype and "Quick Time player" for the face-to-face interviews. We attempted to follow some recommendations to make the interview process more effective (Myers and Newman, 2007). The NVIVO software was used to analyze a verbatim transcription of all the interviews.

<Which IT governance frameworks and standards are used in your institution?> was the question that triggered the interview. Details concerning the frameworks were also asked as well as processes implemented and the perceived difficulty for their implementation.

Table 3 shows relevant quotes from the interviews regarding the frameworks used on IT governance at each of the six universities.

Table 3: Quotes from the interviews on Frameworks for IT Governance

University	Quotes
1	"We have implemented the framework **ITIL,** particularly in **Incident Management, Help Desk** and **Configuration Management Database (CMDB).** We do not have COBIT implemented. However, COBIT is important for development. Unfortunately, we do not have many processes implemented internally. Regarding security framework, we do not have any institutionalised."
2	"We use **ITIL** here. We have implemented help desk and incident management. We are working to implement the other ITIL processes. Also, we try to follow the **PMBOK** for project management. We have people certified in PMBOK**.** We use PMBOK as a reference for project management. We try to get pieces of each methodology, not just following one."
3	"We use the **ITIL** process. We conduct the management demand with a tool (…) in the Help Desk. I would like to be certified in security, **ISO 27001.**"
4	"We try following **ITIL,** we have implemented **Incident Management**. We use a **service desk** tool for management demands. We follow the best practices and process on **PMBOK** for project management."
5	"Most frameworks implemented are **ITIL, and ISO 27001** for security, and COBIT is not implemented. COBIT is hard to use. **ITIL is better and easy to implement. ITIL is more practical**, I would not say better but more practical. However, it is not easy because it is necessary to compile the processes. The framework SOX is not implemented. It is typical in America. We use mostly the framework **BiSL**, it is typical in the Netherlands (…) We use **PRINCE2, it** is the effective **standard in the Netherlands**."
6	"We use **ITIL** for IT **service management**. Some processes are implemented (problem **management, incidents management, configuration, service desk). ITIL is more practical than COBIT and easier to implement.** We have **the service desk well-structured on all the levels**. For the security of the framework **ISO 27001** is adopted**.** However, the reference framework followed is **BiSL**. BiSL is a framework developed to the Dutch reality. We follow all recommendations of this framework and methodology in the institution. **PRINCE2** is the project management methodology used."

Table 4 identifies the frameworks adopted and implemented for IT governance at the universities in our study.

Table 4: Frameworks Used at Universities in our Study

	Brazil		Portugal		Netherlands	
Frameworks	**1**	**2**	**3**	**4**	**5**	**6**
BiSL					x	x
COBIT						
ISO 27001			x		x	x
ITIL	x	x	x	x	x	x
PMBOK		x		x		
PRINCE2					x	x

After transcribing the interviews, we performed a content analysis to inform the discussion that follows in the next section.

Discussion

Understand the reasons why certain choices have been made for IT governance at universities, what works or does not work, what has adopted or has not been adopted, can be important to make recommendations for a cost-effective approach to IT governance at universities. A first step is to uncover which frameworks and standards the universities have been using for the governance of IT and that was the objective of this study. Six universities across three countries were involved in this study.

From the findings in this study, it is interesting to note that COBIT and ISO/IEC 38500, well known, mostly cited and recommended frameworks for the governance of IT, have not been used in the universities under study. For example, COBIT, although acknowledged as important, is pointed out as hard to use. One framework that is used is the Business Information Service Management Library (BiSL). However, although it is in the public domain, it is not easy to find documentation in English and its use seems to be restricted to one country, The Netherlands.

ITIL is the framework that has been used in all the six universities. One of the reasons is because is pointed out as something more practical to enable IT services. Service desk and incident management are the most common processes implemented in all universities following detailed advice from ITIL.

This use of ITIL is particularly relevant for IT management, more in line with an internal focus, with IT still concerned with operational services to assure the adequate quality of service to students, faculty and staff. However, from the management to the governance of IT, there is still a long way to go. Anyway, these findings from this exploratory study are in line with the literature where it is argued that the level of maturity in the use of IT governance frameworks is still low.

Other findings, regarding related best practices for IT, reveal a difference on the adopted standard for IT project management. While PRINCE2 is the standard for IT project management in the Dutch universities, the universities in Brazil and Portugal prefer to adopt PMBOK. Where there is a consensus is on the need to work the culture of project management, essential to structure and help to implement the best practices in IT project management. On what concerns IT security, while the Brazilian, Portuguese and Dutch universities have adopted ISO 27001, American universities tend to use frameworks from the National Institute of Standards and Technology (NIST).

Conclusions

This work was particularly focused on establishing the current state of affairs on the use of frameworks for the governance of IT at universities. So far, it seems that universities

- try not to invent, but rather base their efforts on existing frameworks and standards;
- implement mainly basic stuff, such as incident management and help desk;
- tend to adopt frameworks that are regionally more relevant;
- devote a much more concrete treatment to management than governance.

IT at universities is still concerned with basic issues regarding the quality of service that is provided to students, professors and staff. A way of addressing them in a quick and effective way is to adopt known best practices. Among several ones, the ITIL framework seems the most practical and easy to adopt, providing detailed guidance on many processes, some of them, on operational management, are of particular concern at universities like service desk and incident management. Before moving to IT governance, universities find an easy way to address first management issues starting with ITIL.

This research is exploratory and has some limitations. Even if the reality across three countries has been under study, it is a rather small fraction of that reality and just from the perspective of IT professionals.

Knowing how universities deal with IT governance is interesting, but even more interesting will be to know to what extent universities experience significant limitations in the way they govern IT, something that we intend to pursue in future work.

It seems that IT at universities is still quite focused on operational and managerial issues. The case for IT governance is still to be made in order to make clear that IT is becoming increasingly crucial for delivering strategy in the business of higher education.

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