ABSTRACT

IT governance (ITG) calls for the definition and implementation of formal mechanisms at the highest level in the organization taking into account structures, processes and relational mechanisms for the creation of business value from IT investments. Several factors can influence ITG implementation success. Culture is one of these factors and the one this research will focus on. Seen as probably the most difficult factor to change since it is grounded on practices performed over time, it should receive special attention. This paper aims to analyze how can culture influence on ITG implementation of structure, processes and relational mechanisms in the context of higher education. Ten case studies in universities from three different countries: Brazil, Portugal and Netherlands were carried out. The purpose is the identification of relevant differences in ITG implementation among organizations from the following cultures: Uncertainty Avoidance and Individualism. This article concludes by presenting key contributions, limitations and future work.

KEYWORDS

IT governance, Culture, Universities, Case study

1. INTRODUCTION

IT has become essential in supporting the growth and sustainability of all types of organizations (De Haes, Van Grembergen, & Debreceny, 2013; Williams & Karahanna, 2013; Wu, Straub, & Liang, 2015). Moreover, the pervasive use of technology has created a critical dependency on IT that demands considerable attention to IT Governance (ITG) (De Haes & Van Grembergen, 2008a).

ITG includes processes, people, and structures to guide decision-making around technological issues (Grama, 2015). When properly implemented, ITG can impact the organization positively and enhance business/IT alignment (Wu et al., 2015). To manage the variety of technologies, ITG mechanisms are necessary to support IT-related decisions, actions and assets and to make sure they are tightly aligned with an organization's strategical and tactical intentions (Pereira, Silva, & Lapão, 2014).

In the past years some studies have pointed that ITG implementation lead to higher performance in terms of profitability, efficiency and cost savings (Ali & Green, 2012; Lunardi, Becker, Maçada, & Dolci, 2014; Pang, 2014; Weill & Ross, 2004). Thus, there is evidence that effective ITG mechanisms and frameworks maximize the creation of business value in organizations.

Despite the denoted importance of ITG for organizations, the process of identifying the right ITG mechanisms to apply to a specific context is a complex endeavor which may depend on the organization's size, country, industry, culture, control (public or private) along with other factors (Marrone, Gacenga, Cater-Steel, & Kolbe, 2014; R. Pereira & M. M. Silva, 2012; Sambamurthy & Zmud, 1999)

Corporate culture plays an invaluable role in the enterprise development. Management of culture is to make employees care about enterprise (Jiandong & Hongjun, 2010) and its context refers to managing IT workers and workplaces in such a way that the social processes, which reflect the interactions among groups of people with differing worldviews, are considered (Weisinger & Trauth, 2003).

Surveys of CEOs have identified organizational culture as one of the largest inhibitors to change and related business performance improvements (Gerrard, 2009), which means corporate culture can influence the success of ITG implementation (Fink & Ploder, 2008).
It is essential that organizations with complex IT have ITG in place to operate. Different organizations need different solutions for ITG (Jairak, Prasong, & Pilastpongs, 2015). A mechanism that may be suitable for an organization in the financial industry may not be suitable for an organization in another industry (Brown & Grant, 2005; De Haes & Van Grembergen, 2008a; Van Grembergen, De Haes, & Guldentops, 2004). De Haes and Van Grembergen (2009) have identified a baseline of ITG mechanisms for Belgium's financial industry. Pereira et al. provided ITG mechanisms for the Portuguese financial industry (2014) and healthcare industry (2014). These outcomes show that baseline mechanisms differ across industry sectors.
Universities are complex organizations that require adequate IT and information systems (IS) to fulfil their mission. Their IT consists of a variety of applications, different platforms, academic systems, cloud applications, i.e. a heterogeneous set of technologies (Svensson & Hvolby, 2012; Wilmore, 2014). Different systems, structures, processes and technologies can be found at universities leading to considerable complexity in managing IT.
The effective and efficient use of IT at universities to support research, teaching and management requires appropriate ITG (Bajgoric, 2014; Conger, Winniford, & Erickson-Harris, 2008; Hicks, Pervan, & Perrin, 2012; Jairak et al., 2015; Wu et al., 2015).
As pointed out in several journals, research on ITG culture is still scarce but has gained greater attention recently (Khouja, Rodriguez, Ben Halima, & Moalla, 2018; Schlosser, Beimborn, Weitzel, & Wagner, 2015; Wu et al., 2015).A possible challenge may be to understand how universities (industry) are implementing ITG mechanisms having into consideration their specific context and practices (culture). Given the relevance that ITG and contingency factors have gained in IS, building upon the work of Ko and Fink (2010), Schlosser et al., (2015), Wu et al. (Wu et al., 2015) Pereira et al., (Pereira, Almeida, et al., 2014) (Marrone et al., 2014; R. Pereira & M. Silva, 2012; Sambamurthy & Zmud, 1999). Previous researchers request for more empirical research on IT governance and organizational culture (P Aasi, Rusu, Leidner, Perjons, & Estrada, 2018; P. Aasi, Rusu, & Vieru, 2017; Brown & Grant, 2005; Jairak et al., 2015), specifically, in the context of IT governance in higher education, there is scarce research on the influence of culture on IT governance performance. This study intends to contribute to the body of knowledge on ITG, answering the following research question: **How national culture influences the choice of IT governance mechanisms in universities?**
This article is structured as follows: Section 2 introduces the theoretical background of ITG, ITG mechanisms, ITG in universities, and ITG and the cultural differences. Section 3 presents a research methodology and case study interviews. The findings and results of this study are illustrated afterwards in Section 4. Finally, the conclusion and future research proposals are discussed in Section 5.

2. THEORETICAL BACKGROUND

2.1. IT Governance

ITG first appeared in the 1990s in the IS literature (Henderson & Venkatraman, 1993). Many authors define ITG under different meanings. We use the following definition provided by De Haes and Van Grembergen (2009, p. 123): "ITG consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategy and objectives". Corporate Governance of IT is the system in which the current and future use of IT is directed and controlled to support the organization according to ISO/IEC 38500 (2008) and has been recognized by a number of studies (P. Aasi, Rusu, & Shengnan, 2014; Nfuka & Rusu, 2011; Qassimi & Rusu, 2015).

2.2. IT Governance Mechanisms

ITG involves a set of high-level definitions, such as principles, values and goals, operationalized through mechanisms (Wiedenhöft, Luciano, & Macadar, 2016). Thus, ITG mechanisms are a practical manifestation of these high-level definitions and contain day-by-day activities as a way to execute ITG in practice. An ITG framework may be deployed using a set of mechanisms including structure, processes, and relational mechanisms (De Haes & Van Grembergen, 2004, 2005, 2009; Peterson, 2004; Weill & Ross, 2004).

ITG structures are responsible for defining roles and responsibilities. ITG structural mechanisms are related to "the degree to which the organization has established organizational units and roles responsible for making IT decisions such as committees"(Wu et al., 2015).

ITG processes refer to planning and strategic decision making of IT based on practices. ITG processes are related to "the degree to which the organization has established formal processes to monitor and ensure that IT policies are consistent with business needs" (De Haes & Van Grembergen, 2008a, 2008b; Webb, Pollard, & Ridley, 2006; Weill & Ross, 2004; Wu et al., 2015).

ITG relational mechanisms include the participation and interaction between IT and business. Appropriate communication and knowledge sharing combined with learning and coaching is important (De Haes & Van Grembergen, 2008b; Webb et al., 2006; Weill & Ross, 2004). ITG relational mechanisms are related to "the degree to which the organization has established channels to ensure proper communication and disseminate ITG principles" (Wu et al., 2015).

2.3. IT Governance in universities

The need for ITG has also been identified by higher education IT leaders as one of the top ten IT issues to achieve success (Allison, DeBlois, & Educase, 2008).

IT has an enormous impact on higher education institutions regarding educational performance, learning systems, research productivity, internationalization and integration with universities from other countries. ITG is an essential and important area of study in IS that fortunately has gained more recognition recently (Wu et al., 2015). However, empirical studies in this field are still scarce particularly in universities (Jairak et al., 2015).

Universities from many countries, have increasingly recognized the importance of ITG (Jairak et al., 2015). However, despite the recognition of ITG relevance among university executives, the level of adoption of ITG mechanisms is low (Yanosky & Caruso, 2008). Complex organizations, such as universities, should frequently review their ITG mechanisms to deal with innovation and changes in their environment and adapt to new technologies. It is not only necessary but also essential for these types of organizations to reduce risk and resolve vulnerabilities to provide a high quality and efficient service.

2.4. IT Governance and the cultural differences

The literature shows several definitions and conceptualizations for culture as noted by Leidner and Kayworth (Leidner & Kayworth, 2006). We are adopting the concept of culture defined by Schein (Schein, 2009, p. 27) " *is a pattern of shared tacit assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems"*.

A research conducted by Aasi et al. (P. Aasi et al., 2014) has indicated that culture in different levels (i.e. national culture, organizational culture) is one important factor that can influence IT governance. Moreover, culture can affect information systems and also ITG performance in organizations. As a result, the effective organizations have a strong and clear culture (P. Aasi et al., 2014).

There is a lack of research on how the culture can influence IT governance and particularly on its structures and processes areas as pointed out (P. Aasi et al., 2014). Following the recommendation by Aasi et al. (P. Aasi et al., 2014) to investigate more upon ITG culture in different countries, this article aims to analyze the influence of culture on ITG implementation in universities. While, some authors have investigated the culture on organizational level and in the industry. For instance, in large Swedish Company (P. Aasi, Rusu, & Han, 2016), and others at National level, in China (Zhong, Vatanasakdakul, & Aoun, 2012), few studies were carried out at universities in countries such as Brazil, Portugal and Netherlands.

The results have demonstrated that culture has various impacts on IT governance influencing in the choose of structures, processes and relational mechanisms (P. Aasi et al., 2014). Few studies attempted to compare the choose of these mechanisms at national level and in context of universities. Whereas, this study intends to contribute at national level and in the context universities. Therefore, we are adopting the Hofstede 'approach for culture.

According to Hofstede et al. (Hofstede, Hofstede, & Minkov, 2010), there are six different dimensions for characterizing and measuring the national culture: power distance, individualism/collectivism, muscularity/ femininity, uncertainty avoidance and long term orientation.

Power distance (PDI): This dimension expresses the degree to which the less powerful members of a society accept and expect that power is distributed unequally. The fundamental issue here is how a society handles inequalities among people. People in societies exhibiting a large degree of Power Distance accept a hierarchical order in which everybody has a place and which needs no further justification. In societies with low Power Distance, people strive to equalize the distribution of power and demand justification for inequalities of power.

Individualism/Collectivism (IDV): pertains to societies in which the ties between individuals are loose: i.e. everyone is expected to look after himself or herself and his or her immediate family. Collectivism (as its opposite) pertains to societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty.

Masculinity/femininity (MAS): the extent to which the dominant values of a society are "masculine" (e.g., assertive and competitive). Masculinity pertains to societies in which social gender roles are clearly distinct (i.e., men are supposed to be assertive, tough, and focused on material success whereas women are supposed to be more modest, tender, and concerned with the quality of life). Femininity pertains to societies in which social gender roles overlap i.e., both men and women are supposed to be modest, tender, and concerned with the quality of life.

Uncertainty avoidance (UAI): the extent to which the members of a culture feel threatened by uncertain or unknown situations, and try to avoid such situations. This feeling is, among

other things, expressed through nervous stress and in a need for predictability (a need for written and unwritten rules).

Long Term Orientation versus Short Term Normative Orientation (LTO): Every society has to maintain some links with its own past while dealing with the challenges of the present and the future. Societies prioritize these two existential goals differently. Societies who score low on this dimension, for example, prefer to maintain time-honored traditions and norms while viewing societal change with suspicion. Those with a culture which scores high, on the other hand, take a more pragmatic approach: they encourage thrift and efforts in modern education as a way to prepare for the future.

Indulgence versus Restraint (IND): Indulgence stands for a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. Restraint stands for a society that suppresses gratification of needs and regulates it by means of strict social norms.

In this article, we adopted this classification the national culture. Using the Hofstede tool (Hofstede, 2017), we compared the countries 'culture. For instance, Portugal and Brazil have Uncertainty Avoidance (UA) culture, while the Netherlands falls by individualism (I) culture. These types of culture were selected grounded on Hofstede tool.

3. RESEARCH METHODOLOGY

Previous studies have examined ITG and culture in different industries, but few studies attempted to understand the national culture in the influences the choice of IT governance mechanisms in higher education. This is an exploratory study in its nature looking at to understand the influences of national culture on IT governance in universities, something that was explored very little so far and calls for a better understanding. The case study method is particularly appropriate for these type of studies and well-suited to capture knowledge and develop theories (Benbasat, Goldstein, & Mead, 1987). A case study is adopted where investigating the "how" or "why" research questions and when the phenomenon is new (Yin, 2009). The case study is suitable to answer our research question. The phenomenon, IT governance and national culture in the context of higher education industry has not received much attention. We used a multiple case approach (Yin, 2009) in which ITG mechanisms are examined across 10 universities, each one a case under study. These 10 cases, played an important role in their selection, were selected bearing in mind two cultures (UA and I), and the same industry (universities) in common. All universities studied are large and public. While attempting to answer which is the influence of culture in ITG implementation at universities, unlike other studies focusing on a specific culture (organizations of the same country), we selected universities from different countries.

3.1. Data Collection

In order to identify suitable ITG mechanisms for universities so further conclusion about the influence of culture in ITG implementation could be withdrawn, we performed semi-structured interviews in 10 universities, in three different countries; Brazil, Portugal and the Netherlands. We carried out the interviews with CIOs, IT Coordinators and IT Directors) since these are the IT decision-makers at top management and medium levels that are responsible for IT issues (ITGI, 2003). Table 1 shows the profile of each interviewee.

We contacted the universities by phone and e-mail explaining the purpose of the study. Then the university indicated the most appropriate person to be interviewed. An invitation was sent to that person to schedule the interview. Adding to that invitation, a document with the ITG mechanisms' definition was sent to ensure that all interviewees had the same understanding of

each mechanism as well as the questionnaire to be used during the interview. The questionnaire was developed in three parts: the first part, with general questions about the institution; the second part, comprising of personal questions about the interviewee; the third part, including questions regarding the ten most important mechanisms. Each interviewee had to choose the 10 most important mechanisms from a list of 46 mechanisms regardless of having or not having been implemented in their institutions The interviews were conducted between August of 2017 and May of 2018. Face-to-face interviews were conducted in the Netherlands and Portugal, while skype interviews were conducted with the Brazilian based interviewees.
While conducting the interviews, we attempted to follow Myers and Newman´s recommendations (Myers & Newman, 2007, pp. 16-17): situating the researcher, minimizing social dissonance, representing a variety of voices, everyone is an interpreter, using mirroring in questions and answers, and flexibility, and confidentiality of disclosures. In this way, the interviewer presented himself as someone in the context of universities, while respecting culture differences, giving voice to differences, and ensuring the confidentiality of the information. In addition, observations, documents, the IT website and IT strategic plans' analysis were also used to confront the interviewees and ensure an awareness and certainty of their answers. The next section provides analysis of the collected data.

3.2 Data Analysis

In this section, the collected data is discussed. Table 1 lists information collected from the interviews. Ten mechanisms were chosen by each interviewee. These mechanisms will be analyzed and conclusions will be drawn. The researcher noted observations in loco in ITG at institutions and read all the documents provided before the interview. The data were analyzed using Microsoft Excel, creating a frequency sum of each chosen mechanism At Table 2 the authors depict interviewees' choices in yellow cells over the columns.
An additional column for each culture provides information on the frequency of the top ten selected mechanisms chosen by each interviewee. Yet, a final column is presented with the perspective of the two cultures together. Cells with green color represent the most chosen mechanisms of organizations from each culture. Only mechanisms at least chosen by half of each culture sample were marked with green. The green cells at the final column (joint) also followed the same rational.

Table 1. Interviewees and details

	Country	Position	Education	Experience in IT (years)	Experience in the position (years)	Duration of Interview (hours)
1	Portugal	IT Director	Master	20-24	3 or less	2.0
2	Portugal	IT Director	Master	14-19	3 or less	1.5
3	Brazil	IT Director	Master	14-19	4-6	3.0
4	Brazil	IT Coordinator	Master	14-19	10 or more	2.5
5	Brazil	IT Coordinator	Master	14-19	4-6	3.0
6	Brazil	IT Coordinator	Master	14-19	3 or less	2.5
7	Netherlands	CIO	Master	25 or more	10 or more	1.5
8	Netherlands	IS Architecture	Master	14-19	10 or more	1.5
9	Netherlands	CIO	Master	25 or more	3 or less	1.5
10	Netherlands	IS Architecture	Master	20-24	10 or more	2.0

Table 2 presents the information about the most important mechanisms chosen by the interviewees. The white-empty cells represents the ITG mechanisms that were not selected by the interviewees at universities. We chose only the classification UA and I because it was the classification provided by Hofstede tool about the countries' culture. We could discuss others but we would not have information to support any conclusion.

Table 2. Information about the most important mechanisms chosen by the interviewees

	Culture UA						Frequency	Culture I				Frequency	Total
	PT		BRA					NED					
Structures Mechanisms	**1**	**2**	**3**	**4**	**5**	**6**		**7**	**8**	**9**	**10**		
IT organization structure							4					0	4
ITG function / officer							3					2	5
Security / compliance / risk officer							0					1	1
Business/IT relationship managers							3					2	5
Integration of governance tasks in roles & Responsibilities							2					1	3
IT steering committee							2					2	4
IT strategy committee							5					3	8
Architecture steering committee							1					0	1
IT project steering committee							0					1	1
Processes Mechanisms	Total						20	Total				12	32
	%						33	%				30	
Demand management							2					1	3
Strategic information systems planning							6					3	9
IT performance measurement (BSC)							2					0	2
Portfolio management							2					3	5
ITG assurance and self-assessment							0					1	1
Frameworks ITG							6					3	9
IT budget control and reporting							3					1	4
Service level agreements							1					0	1
Project Tracking							2					0	2
Benefits management and reporting							0					2	2
Relational Mechanisms	Total						28	Total				15	43
	%						47	%				38	
Office of CIO or ITG							1					2	3
Knowledge management (ITG)							6					4	10
Informal meetings							1					1	2
Corporate internal communication							1					0	1
IT leadership							1					2	3
Co-location Business/IT collocation							0					2	2
Business/IT account management							1					1	2
Shared understanding of business/IT objectives							1					1	2
	Total						12	Total				13	25
	%						20	%				32	

The authors have also added for each type of mechanisms (structure, processes, relational) a line with the total choices and the percentage of choices of the correspondent type. The percentage is important for more rigorous comparison between cultures since we have not interviewed the same number of persons for each culture. The last column (joint) also have values for total and percentage but in this specific case they are the same since the sum of all mechanisms chosen by the interviewees is equal to hundred.

4. DISCUSSION AND CONCLUSION

Each interviewee had to choose the 10 most important mechanisms. The aim of choosing ten mechanisms was to promote generalization/comparison with other similar studies.

Table 2 presents most of the information collected during the interviews. From these data, several conclusions can be leveraged. Two cultures are under study in the same industry, education. These cultures are: Uncertainty Avoidance (UA) and Individualism (I).

4.1. Culture Uncertainty Avoidance

From a universe of 46 possible mechanisms (the 10 most important selected in each interview), 33% were structural mechanisms while 47 % were process and 20 % were relational mechanisms. Such results indicate that the processes mechanisms are seen as the most relevant. On the other hand, the relational mechanisms are the less suggested as most relevant.

Among the 9 most chosen mechanisms (green cells) we have four structure mechanisms, four processes mechanisms and only one relational mechanism. Despite the 14% difference (47% - 33%) between structure and process mechanisms the number of most chosen mechanisms are equal. This means that interviewees have more confidence on the set of possible structure mechanisms that may be the more relevant for their industry in their culture and not so much regarding process mechanisms. While in structure mechanisms choices ran over 8 mechanisms, in process mechanisms choices ran over 9 possible mechanisms.

Another interesting conclusion is that none of the most chosen structure mechanism were fully consensual among the interviewees. But, when looking to the process mechanisms, two out of four were chosen by all the interviewees (Strategic Information Systems Planning, and Frameworks ITG).

Finally, the single relational mechanism among the most chosen is also fully consensual among the interviewees collecting 6 out of 6 possible choices. This mechanism is the knowledge Management (ITG).

To sum up, the interviewees of culture **UA** point for more focus on process mechanisms followed by a few less focus on structure mechanisms and with relational mechanisms being the less relevant. Three mechanisms were chosen by all the interviews which clearly demonstrate their relevance.

4.2. Culture Individualism

From a universe of 46 possible mechanisms (the 10 most important selected in each interview), 30% were structural mechanisms while 38 % were process and 32 % were relational mechanisms. Such results indicate that the processes mechanisms are seen as the most relevant. On the other hand, the structure mechanisms are the less suggested as most relevant.

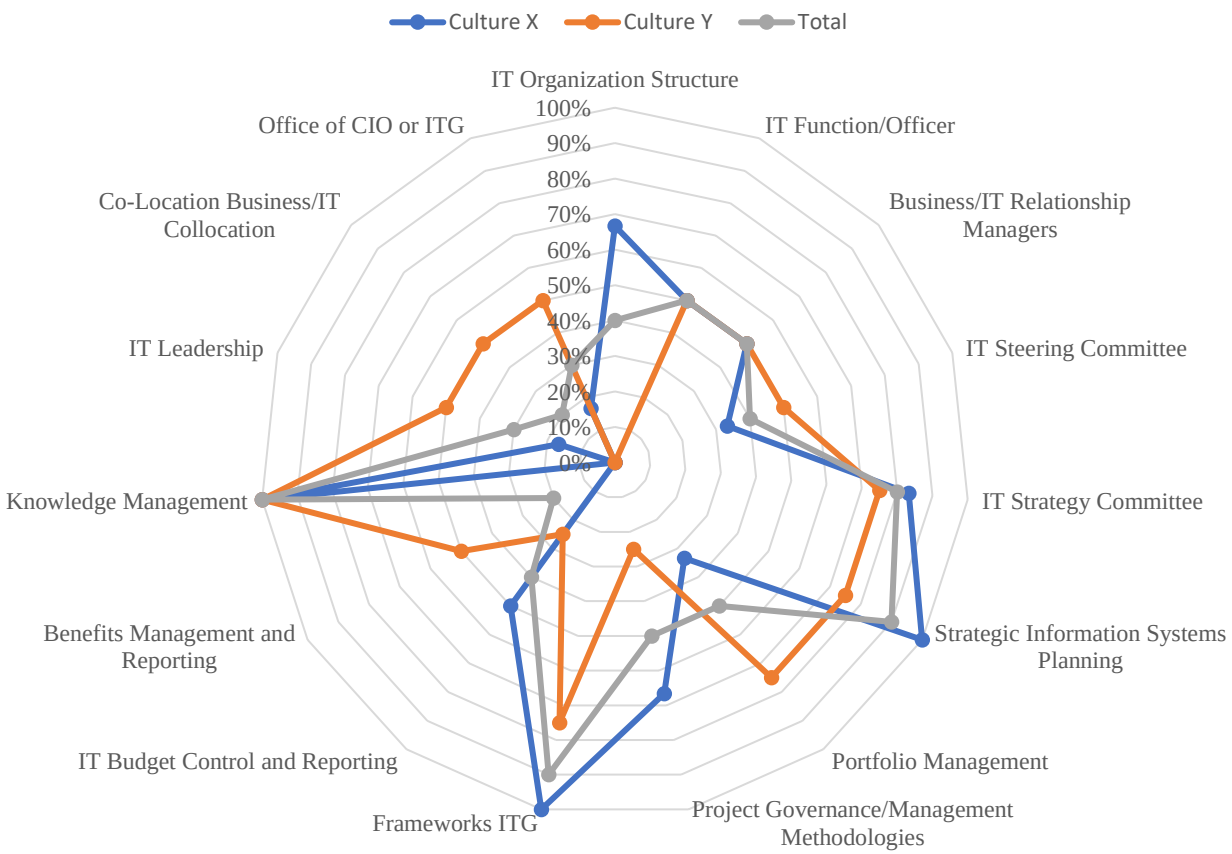
Among the 12 most chosen mechanisms (green cells) we have four structure mechanisms, four processes mechanisms and four relational mechanism. Only 8% points separate the most chosen type of mechanisms from the less chosen. Such evidence indicates that interviewees have a more homogeneous opinion about the several mechanisms types relevance. Nevertheless, process mechanisms tend to be little bit more relevant and structure mechanisms the less relevant for their industry in their culture. While in structure mechanisms choices ran over 7 mechanisms, in process mechanisms choices ran over 8 mechanisms and in relational mechanisms choices on 7 mechanisms.

Another interesting conclusion is that none of structure mechanisms and process mechanisms among the chosen ones were fully consensual among the interviewees.

But, when looking to the relational mechanisms there is a mechanism which collects the agreement of all the interviewees has being one of the most important (Knowledge Management (ITG)).

To sum up, the interviewee's answers of culture I point for more focus on process mechanisms followed by a few less focus on relational mechanisms and with structure

Figure 1. Analyzing the ten most chosen mechanisms



mechanisms being the less relevant. Only one mechanism was chosen by all the interviews which clearly demonstrate its relevance.

4.3. Comparison of Cultures

In previous sections a brief discussion of the results of each culture was presented. In this section the authors will compare the results and extract conclusion regarding the difference between both cultures. To support such conclusions, the authors present Figure 1. At Figure 1 the authors present a radar chart with
all the mechanisms that were chosen at least by half the interviewees of each culture (all the green cells of both frequency columns) with the correspondent percentage. Blue line has the information about culture **UA**, orange line presents the information about culture **I** and the grey line presents the information of the total column (the total number of choices of a specific mechanism by all the interviewees).

Many interesting conclusions can be withdrawn. Both cultures privilege the process mechanisms as the most important. Then, culture **UA** argues that structure mechanisms are the second most important while culture **I** privilege the relational mechanisms.

While there are 3 mechanisms with total agreement among all culture **UA** interviewees, only one got the consensus among culture **I** interviewees. The single most chosen mechanism of culture **I** is common with one of the 3 most chosen culture **UA**.

Considering all the choices there are 4 mechanisms that stand out from the remaining (at least a sum value of 8 or more). They are: IT Strategy Committee, Strategic Information

Systems Planning, Frameworks ITG, and finally Knowledge Management (ITG). This can also be easily seen at Figure 1.

Although there are some consensual mechanisms among both cultures as stated in the previous paragraph, some less consensual mechanisms also exist as it can be seen in Figure 1.

The less consensual mechanisms among both cultures are:

- IT Organization Structure: It seems that this mechanism is much more important to culture **UA** (70%) than to culture **I** (0%).
- Portfolio Management: On the contrary, this mechanism seems to be much more valued by culture **I** (75%) and not so much by culture **UA** (33%).
- Project Governance/Management Methodologies: Culture **UA** (66%) believes this mechanism is quite important but culture **I** (25%) doesn't see it that way.
- Benefits Management and Reporting: this mechanism was pointed as quite important for culture **I** (50%) but not important at all for culture **UA** (0%)
- IT Leadership: Seen as important by culture **I** (50%), does not collect much consensus on culture **UA** (17%).
- Co-Location Business/IT Collocation: Again, culture **I** (50%) gives more importance to this mechanism that culture **UA** (17%).
- Office of CIO or TIG: Finally, culture **I** (50%) also gives more importance to this mechanism unlike culture **UA** (0%).

From these 7 mechanism one is a structure mechanism, two are process mechanisms and 4 are relational mechanisms. The structure mechanism is more relevant for culture **UA** which is align with previous conclusions pointing that culture **UA** gives more importance to structure mechanisms as a whole. The two process mechanisms tilts one to culture **UA** and another to culture **I** which is also aligned with previous conclusions showing that process mechanisms are the more important for both cultures. Finally, the four relational mechanisms are all more important for culture **I** which is also aligned whith previous conclusions pointing that relational mechanisms are by far more relevant for culture **I** than for culture **UA**.

Analysing the total percentage we conclude that process mechanisms are the more relevant for education industry, followed by structure mechanisms and relational mechanisms. While this order also fits culture **UA**, culture **I** gives more importance to relational mechanisms instead structure mechanisms. This clearly proves that when focusing in implement ITG organizations must have into consideration not just few factors (Pereira, Almeida, & Silva, 2013) but all of them since it can change the necessary mechanisms to succed.

The aim of this study was to explore the differences on ITG implementation in the same industry (education).

To summarize, differences were found between culture **UA** and culture **I** in education industry. For example, culture **UA** privileges structure mechanisms against relational mechanisms unlike culture **I**. Other interesting findings are the mechanisms that collect considerable consensus in one culture and zero in the other. Finally, these findings must be studied in the future.

To sum up, the outcomes of this research contribute to the academic research in the field of IT governance for higher education institutions by investigating how the national culture culture influences the choice of IT governance mechanisms in universities. This field had not been explored with an empirical study before, in this context.

4.3. Limitations and Future Research

This study has some limitations. First of all, the collected data was limited to three countries. Second, only one executive was interviewed in each university. Third, more interviews were performed to culture UA than to culture I and this fact can influence in part the justice of the

conclusions. Directions for future research could compare more type of culture and the impact on the organization. The organizational culture could be used to analyse the IT governance performance in organizations with different types of control (public vs private).

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