Pilot Project for Implementing Corporate Governance of IT

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ABSTRACT

This article presents the results of the IT Governance Enhancement Project (ITGEP) carried out in three Spanish universities (the University of Murcia, Jaume I University and the Polytechnic University of Cartagena) on the initiative of the IT Commission of the Spanish Association of University Rectors (CRUE).

The aim of the project was to apply the reference framework of Governance of IT for Universities (GTI4U) in order to determine the best practices currently carried out in the three universities, as well as to ascertain their level of maturity of corporate governance of IT. The project also provides an empirical evaluation of the implementation process, the GTI4U framework and its tools.

The GTI4U framework was implemented in each university in a four-stage process: first an IT Governance Committee (ITGC) was set up and given responsibility for carrying out the remaining stages; the ITGC members were then taught the basic notions of IT governance, the GTI4U framework and how to implement it; there followed a self-assessment process to determine the maturity level of corporate governance of IT and which best practices fit the needs of the university; finally an IT Governance Improvement Plan was drawn up for the university.

The ITGC members had a high opinion of the GTI4U framework, awarding it a mark of 4.3 on a scale of 0 to 5. They regarded GTI4U as a "reference of the highest calibre" which aspires to the maximum level of IT governance, also considering that the recommended improvement actions correspond to the most demanding professional practices. In addition, they deemed the process designed to carry out the ITGEP to be efficient and satisfactory (awarding it a mark of 4.3) and they recommended that similar processes be implemented by other universities (4.6).

As regards the best practices of IT governance applied in the three universities, it was observed that 1 of each 3 best practices proposed by GTI4U were applied in relation to the principle of *Responsibility and Strategy* in ISO 38500, while for the principles of *Acquisition, Performance, Conformance* and *Human Behaviour* 1 of every 4 best practices were applied. These results are a clear indication that these three universities are in the early stages of corporate governance of IT and need to implement new best practices.

The current maturity of corporate governance of IT is also at the lower levels of the scale for all the principles of ISO 38500, in no case surpassing the "Repeatable" level (level 2 on a scale of 0 to 5).

The aim of both the CRUE and the authors of the present article is that the pilot project (ITGEP) and the GTI4U framework should become a valid reference source and should be used in the near future by many other universities that are committed to improving their corporate governance of IT.

1. INTRODUCTION

In early 2011 the IT Commission of the Spanish Association of University Rectors (CRUE in Spanish) launched the "IT Governance Enhancement Project" (ITGEP) to assess the maturity of corporate governance of IT practices and to foment their implementation in three universities: the University of Murcia (UM), Jaume I University (UJI) and the Polytechnic University of Cartagena (UPCT).

Based on the characteristics analysed in this pilot project, the former is medium-sized (30,000 students), while the latter two can be termed small universities (fewer than 20,000 students). Regarding their attitude to IT, all three can be defined as *offensive* (Nolan and McFarlan, 2005) and their IT management is *innovative*, according to the self-assessment which appears in UNIVERSITIC (2011). Indeed, UJI is deemed *front runner* while the other two are regarded as *co-operating universities* in accordance with the criteria of IT usage proposed by PLS RAMBOLL Management (2004).

The ITGEP aims to improve IT governance in the universities taking part, but also to provide an empirical assessment of the reference framework for corporate Governance of IT for Universities (GTI4U in Spanish) and of its tools. GTI4U was proposed by Fernandez (2009) and Fernandez and Llorens (2009) and later revised by Fernández (2011) as a reference framework for the implementation of corporate governance of IT specifically designed for universities and which fully complies with the ISO 38500 (2008) international standard. As well as a reference framework, GTI4U includes a series of tools which facilitate its application: a set of best practices of corporate governance of IT (compiled from the best practices proposed by the main professional models and reference frameworks), maturity models of reference for each principle of the ISO 38500, and a set of measures to improve the level of maturity of corporate governance of IT (also taken from the main reference frameworks). Both the reference framework and the tools have been incorporated into a web application called kTI, which is intended as support software for the ITGEP (Fernandez, Llorens and De Andres, 2011).

Completed in late 2011, the ITGEP is a valuable project whose results may well become an excellent reference source for universities that intend to implement corporate governance of IT systems or to improve existing ones. Furthermore, as the number of universities analysing the maturity of their corporate governance of IT using GTI4U increases, priceless information will be obtained on the overall state of universities, allowing us to establish the mean level of maturity of corporate governance of IT in different groups, sectors or categories (for instance the Spanish university system or the European Higher Education Area).

2. DESCRIPTION OF THE IT GOVERNANCE ENHANCEMENT PROJECT (ITGEP)

Each university taking part in the ITGEP has benefited in the following ways:

- The university Governance Team has a better understanding of the overall picture of IT in their university.

- The Governance Team can enhance the value that IT brings to their university by applying better policies and procedures, and by making organisational changes.

- They are now able to define medium-term IT objectives more easily.

- They are provided with a series of improvement actions to fulfill the above-mentioned IT objectives.

- They are now in a position to compare themselves with other universities and to evaluate their level of corporate governance of IT maturity with respect to the ISO 38500 international standard.

- All of the above helps to portray a more modern and innovative image of their university.

The ITGEP consists of the following stages (Figure 1):

1. **Creating the IT Governance Committee (ITGC).** In the first stage, a working group is set up to take responsibility for carrying out the remaining stages of the ITGEP in the university. According to the ISO 38500 (2008), corporate governance of IT is the responsibility of the highest directors of any organisation. As far as universities are concerned, we recommend that it should be the responsibility of the Governance Team (Rector/Vice-Chancellor, Vice-Rectors/Pro-Vice Chancellors and CIO) and of the IT directors with strategic responsibility for

IT. In the three universities involved in this project the ITGC consisted of between 7 and 11 members, 40% of whom formed part of the university Governance Team.

2. **Educating the ITGC**. Van Grembergen and De Haes (2008) state that the second stage must consist of educating the members of the ITGC. In many cases we have observed that the members of university governance teams are not aware of the principles, structures and processes involved in IT governance. They must therefore be provided with certain basic knowledge in order to become aware of their responsibility in relation to this matter. They will then be able to approach the subsequent stages of the ITGEP more efficiently.

3. **Self-assessment of the maturity of corporate governance of IT**. During this stage, the ITGC must first establish the **best practices** related to corporate governance of IT that are currently being carried out in the university. They must then determine the **level of maturity** of these practices in the university in relation to each of the six principles of corporate governance of IT laid out in the ISO 38500 (Figure 2). In a first step the ITGC will be asked about a set of indicators that show whether the best practices proposed by GTI4U are being applied. To assess the maturity of IT governance, the ITGC must respond to a set of questions on maturity, and GTI4U will infer the university's level with respect to the maturity model for each principle included in this framework. Once the surveys have been completed, the answers must be compared and contrasted to obtain single values that reflect the overall situation of the university.

4. **Drawing up an Improvement Plan for IT Governance (IPITG)**. This stage commences with a proposal of the governance maturity level that the university wishes to attain in the short term, i.e. in one year. This proposal must take into account both the results of the previous stage and the strategic objectives defined by the university. Once the target maturity level has been proposed, GTI4U will recommend a series of actions to improve the current situation and allow the university to reach that level. The ITGC will then review the proposed actions with a view to agreeing on a final set of improvement actions to be carried out. These will be set forth in a written document that establishes how they are to be implemented. Finally, the IPITG will be presented to the Governance Team, which will proceed to review, approve and implement it.

Figure 1. Stages of the IT Governance Enhancement Project (ITGEP)

Prepared by the authors based on Van Grembergen and De Haes (2008)

Figure 2. Stages of the self-assessment of corporate governance of IT maturity
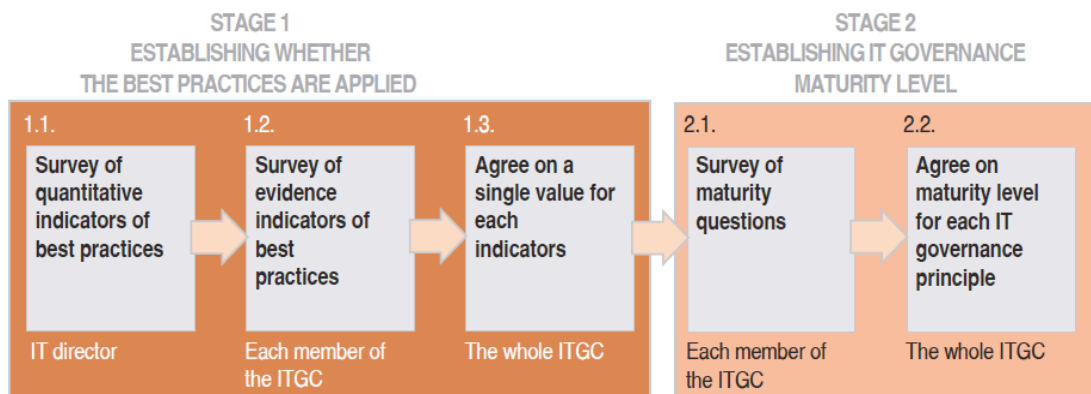
From this moment on the members of the Governance Team must work to: build up support for this plan from other executive officers and high-level managers, create the necessary infrastructure and establish clearly who is responsible for IT in the university, divulge the plan and foment awareness of the importance of corporate governance of IT, monitor the plan and ensure that it is complied

with, and carry out occasional self-assessment surveys of corporate governance of IT with a view to revising the existing plan.

The ITGEP lasted approximately 22 weeks in each university, and the members of the ITGC devoted around 40 hours to the project during that period. They attended 6 meetings lasting around three hours each, and the rest of the time was taken up watching videos, reading articles and completing questionnaires.

3. BEST PRACTICES OF IT GOVERNANCE IN THE ITGEP

This section presents the results obtained during the third stage of the ITGEP, whose main aim is to determine the best practices of corporate governance of IT that are currently being applied in the three universities. For the sake of confidentiality, the participating universities will hereafter be referred to as universities A, B and C.

The results are presented according to each of the principles set forth in the ISO 38500 standard, which have also been incorporated into the GTI4U framework: Responsibility, Strategy, Acquisition, Performance, Conformance and Human Behaviour.

3.1. Responsibility

The basic premise of this principle is that "*individuals and groups within the organisation understand and accept their responsibilities in respect of both supply of, and demand for IT. Those with responsibility for actions also have the authority to perform those actions*" (ISO 38500, 2008). We have therefore anlaysed to what extent the responsibilities of individuals or groups related to corporate governance of IT are well established within the university.

The above-mentioned international standard implies that the university's Governance Team should hold the responsibility for corporate governance of IT and that it should not be delegated without sufficient supervision and the involvement of said team. The basic error that must be avoided is attributing the responsibility for corporate governance of IT to the IT area director or other IT managers. The prime responsibility of the Governance Team is to decide how to delegate these responsibilities.

In this respect, the first best practice to be recommended is that the Governance Team create the figure of *Chief Information Officer* (CIO) who should act as IT executive director. The second one is that the CIO should be "on the Board", i.e. a member of the university Governance Team. According to Llorens and Fernandez (2008), only one in three Spanish universities have created this figure, and only a third of those universities include the CIO in the governance team. In other words only one in nine Spanish universities can truly be said to have a CIO. Nevertheless, all three universities that took part in the ITGEP do have a CIO on the university Governance Team, which constitutes a major step towards creating an effective system of IT governance.

Once the post of CIO has been created, Martin and Fernandez (2011) recommend that the governance team create an IT-related decision making structure in which the CIO plays the leading role. A review of the organisational structures of the three universities that took part in the ITGEP has revealed that they are insufficient to implement an efficient system of IT governance. In addition, they do not feature the committees that are required for effective IT governance, namely the IT Strategy Committee and the IT Steering Committee.

It is of the utmost importance that all members of the organisation understand what is expected of them regarding IT governance. Weill and Ross (2004) state that one of the basic precepts of corporate governance of IT is to establish which persons are responsible for informing on IT (input) and for making decisions on this matter. During the ITGEP, all 27 members of the ITGC filled out the table proposed by Weill and Ross indicating the desirable distribution of responsibility for their university. The results are compiled in Table 1 and they indicate a clear desire that the Governance Team should make decisions on almost all areas, with the exceptions of infrastructure and IT applications, for which the responsibility should also be shared with the CIO and/or the IT Director. As regards the responsibility for providing the information required for the decision making process, the results suggest that it should fall upon the CIO and/or the IT Director in almost every case, with the exception of IT applications, for which those in charge of the university services implied should provide the information.

Finally, the ITGC members completed a survey, the results of which showed that university B employs 52% of the best practices proposed by the GTI4U framework for the principle of

Responsibility, while universities A and C only employ 31% and 17% respectively. The mean result of the universities taking part in the ITGEP for this principle is therefore 33.3% (Table 2).

The best practices related to the principle of Responsibility that are currently being put into practice in all three universities are the following: the university directors are aware of the importance of IT governance; a CIO has been placed in charge of corporate governance of IT with the responsibility to collaborate with the university Governance Team in elaborating the IT strategy; the CIO has been appointed bearing in mind skill and experience as a director and communicative abilities; the CIO is a member of the Governance Team who participates actively in the decision making process.

Table 1. Distribution of responsibilities related to information and decision-making

Prepared by the authors based on Weill and Ross (2004)

	IT Principles		IT Architecture		IT infrastructure strategies		Bussines Aplications Needs		IT investment and priorization	
	Input	Decision	Input	Decision	Input	Decision	Input	Decision	Input	Decision
Governance Team (Rectors and Vice-Rectors)	4%	96%	0%	67%	0%	44%	0%	52%	4%	88%
CIO and/or IT Area Director	68%	4%	52%	30%	54%	52%	4%	41%	64%	13%
Department Directors (Human Resources, Research etc.)	16%	0%	24%	0%	19%	4%	75%	0%	28%	0%
Governance Team and at least one Department Director	0%	0%	4%	3%	4%	0%	0%	0%	0%	0%
CIO/ IT Area Director and at least one Department Director	12%	0%	20%	0%	23%	0%	13%	7%	4%	0%
Only the Department Director affected	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%

Table 2. Best practices of IT governance related to the principle of Responsibility

RESPONSIBILITY	Number of best practices	A	B	C	ITGEP
TOTAL	29	31%	52%	17%	33,3%
Governance Team Responsibility	2	50%	50%	0%	33,3%
IT Governance	7	43%	29%	14%	28,5%
CIO	4	100%	100%	75%	91,7%
Committees	3	33%	100%	0%	44,3%
Assigning responsibilities	7	0%	29%	0%	0,0%
Monitoring	6	0%	50%	17%	22,3%

3.2. Strategy

This principle aims to determine whether *"the organisation's business strategy takes into account the current and future capabilities of IT; the strategic plans for IT satisfy the current and ongoing needs of the organisation's business strategy"* (ISO 38500, 2008). As such, universities that prove incapable of identifying the strategic potential of IT will be at a competitive disadvantage.

Strategic planning of IT must emanate from the university's overall strategy. The UNIVERSITIC study (2011) reveals that IT planning, in line with the strategic objectives declared in the university's general planning, can be found in 52% of Spanish universities, although 14% of them state that the planning is carried out globally for all the university's IT, while the other 38% only carry out planning for centralised IT. Of the universities participating in the ITGEP, university C has not yet drawn up strategic IT planning, while the other two have, but only for those IT that are managed centrally.

The survey of the ITGC members reveals that universities A and B carry out half of the 16 best practices proposed by GTI4U, while university C only carries out 13% of them. The mean result of the universities taking part in the ITGEP for the *Strategy* principle is therefore approximately 38% (Table 3).

The best practices related to the principle of Strategy that are currently being carried out in all three universities are the following: university managers plan IT acquisitions with sufficient foresight and these acquisitions are reflected in the budget of the following financial year; medium-term plans for the renovation of IT have been approved to ensure that IT equipment does not become obsolete and to incorporate new technologies.

Table 3. Best practices of IT governance related to the principle of Strategy

STRATEGY	Number of best practices	A	B	C	ITGEP
TOTAL	16	50%	50%	13%	37,3%
Strategic Plan	3	67%	33%	0%	33,3%
IT policies	4	25%	0%	0%	8,3%
IT resources	4	50%	75%	50%	58,3%
IT innovation	4	50%	100%	0%	50%
IT culture	1	100%	0%	0%	33,3%

3.3. Acquisition

This principle establishes that *"IT acquisitions are made for valid reasons, on the basis of appropriate and ongoing analysis, with clear and transparent decision making. There is appropriate balance between benefits, opportunities, costs, and risks, in both the short term and the long term"* (ISO 38500, 2008).

This principle must be understood in the wider context, as it does not refer simply to the purchase of IT equipment from an outside source, but rather to any decision that may imply the investment of financial or human resources in an IT activity. Consequently, it must include decisions on the implementation of new IT initiatives, decisions on whether to persist with current initiatives and decisions related to the capabilities that are enhanced by IT. In short, the principle of Acquisition must be applied to the whole lifecycle of an IT investment, which means a commitment to changes in the university's management processes. If the decision to invest in IT is to prove successful, it must take into account the whole change implied.

One of the best practices that can be applied in relation to the principle of acquisition is the creation of an IT Portfolio. Though none of the three universities participating in the ITGEP has created a formal portfolio for IT projects, others have, for instance the University of California, Berkeley (2012a).

Table 4. Best practices of IT governance related to the principle of Acquisition

ACQUISITION	Number of best practices	A	B	C	ITGEP
TOTAL	34	38%	18%	26%	27,3%
IT investment	4	100%	50%	50%	66,6%
Acquisitions policy	6	33%	33%	17%	27,6%
Suppliers	5	20%	0%	20%	13,3%
IT projects	7	29%	0%	29%	19,3%
IT acquisitions and projects priority	4	25%	25%	50%	33,3%
IT projects results	6	33%	0%	0%	11%
Collaboration and comparison	2	50%	50%	50%	50%

The mean percentage of best practices carried out in the three universities participating in the ITGEP related to the principle of *Acquisition* is 27 % (Table 4). Once again university A (38%) is ahead of universities C (26%) and B (18%).

The best governance practices that are currently being carried out in all three universities in relation to the principle of *Acquisition* are the following: the university has a single centralised centre of expenditure for investment in IT; the university optimises its investments by using best practices (e.g. consortia, discount negotiations, purchase of special offers, etc.); among the criteria assessed when making an IT acquisition, they consider whether the new proposal can be integrated with existing technologies, whether it complies with standards, and whether it is flexible and adaptable to future changes that may take place within the university; university managers support those initiatives that aim to foment collaboration and the exchange of know-how with other universities.

3.4. Performance

This principle states that *"IT is fit for purpose in supporting the organisation, providing the services, levels of service and service quality required to meet current and future Business requirements"* (ISO 38500, 2008). The bottom line is that organisations need IT to run smoothly at any given moment in time. To do so, IT need not be concerned so much with meeting the established performance criteria, but rather with assisting the university in achieving its strategic objectives. It follows, therefore, that the scope of IT reaches beyond mere computing systems, and that the principle of performance refers to all facets of IT use, from the very first steps of the planning processes, the design and set-up of projects requiring IT, to the implementation of IT-based services and their subsequent monitoring.

The results of the survey completed by the ITGC members shows that regarding the 16 best practices proposed by GTI4U for the principle of performance, university B stood out from the other two, putting into practice 44% of said practices, as opposed to 19% and 13% for universities A and C, respectively. The mean percentage of the universities taking part in the ITGEP for the principle of performance was 25.3% (Table 5).

A more detailed analysis reveals that none of the three universities pays sufficient attention to the best practices regarding the continuity of IT services or those concerning service level agreements with users and suppliers. However, they do appear to have the necessary safety measures to maintain the integrity and quality of their institutional information.

Table 5. Best practices of IT governance related to the principle of Performance

PERFORMANCE	Number of best practices	A	B	C	ITGEP
TOTAL	16	19%	44%	13%	25,3%
Performance	2	50%	0%	50%	33,3%
IT services Continuity	7	14%	43%	0%	19%
Information availability and quality	4	25%	75%	25%	41,7%
Service level agreements	3	0%	33%	0%	11%

3.5. Conformance

This principle states, *"IT complies with all mandatory legislation and regulations. Policies and practices are clearly defined, implemented and enforced"* (ISO 38500, 2008). Any university that does not comply with current legislation and internal norms runs a great risk and cannot justify their actions by arguing ignorance of said legislation. By the same token, if Governance Team has delegated responsibility to other levels of the organisation they must ensure that any decisions taken comply with the law.

The major challenges facing managers regarding IT policies and practices are as follows: drawing up policies that clearly provide motivation and guidance to the other university directors and officials; communicating these policies effectively so that they are known in the whole university sphere; and finally ensuring that they are respected and complied with by all. None of the universities taking part in this project has a formally defined IT policy catalogue such as that of the University of California, Berkeley (2012b).

The survey completed by the ITGC members reveals that university B applies 37% of the 19 best practices proposed by GTI4U for the principle of *Conformance*, while universities C and A carry out 26% and 21%, respectively. The average result of the three universities taking part in the ITGEP for this principle is therefore 28% (Table 6).

Regarding these best practices, it is noteworthy that in all three universities directors encourage those in charge of IT projects and services to take into account both external laws and norms and internal policies and procedures related to IT.

Table 6. Best practices of IT governance related to the principle of Conformance

CONFORMANCE	Number of best practices	A	B	C	ITGEP
TOTAL	19	21%	37%	26%	28%
Catalogues	6	17%	33%	17%	22,3%
Conformance	3	33%	33%	67%	44,3%
Audits	4	40%	50%	25%	28,3%
Standards	6	0%	33%	17%	16,6%

3.6. Human Behaviour

The basic idea of this principle is that *"IT policies, practices and decisions demonstrate respect for Human Behaviour, including the current and evolving needs of all the 'people in the process"* (ISO 38500, 2008).

The importance of IT for a university lies in the fact that they provide support for management initiatives to apply changes to university processes. Any process of change requires the support of those individuals and groups that are involved in it. The attitude and behavior of those people are key factors in achieving the desired results of the change.

Corporate governance of IT in relation to this principle will therefore improve in line with the university managers' ability to understand the important role played by the people in the process, and their ability to assess how the behaviour of those involved affects the ultimate success of ongoing university processes, particularly those supported by IT. The managers must also prove capable of planning the actions to be carried out, with a view to enhancing the participation and support of those involve in or affected by new IT projects that are intended to facilitate processes of organisational change.

One element of risk that may affect the behaviour of these people is the workload assigned to them. None of the universities participating in the ITGEP has made a detailed analysis of the overall workload of those in charge of IT management. Knowledge of this workload is indispensable if we are to deal with other practices related to the same principle.

Of the 14 best practices proposed by GTI4U for the principle of human behaviour, university B applies 36%, while universities A and C both apply 14%. The mean result for the three universities participating in the ITGEP is therefore around 21% (Table 7).

Regarding these best practices, it is noteworthy that in planning IT projects all three universities include a phase during which those affected are trained and informed about the changes to be made in university services that this IT initiative will affect.

Table 7. Best practices of IT governance related to the principle of Human Behaviour

| HUMAN BEHAVIOUR	Number of best practices	A	B	C	ITGEP
TOTAL	14	14%	36%	14%	21,3%
Stakeholders	3	0%	67%	33%	33,3%
Resistance to change	7	14%	43%	14%	23,6%
People in the process	2	0%	0%	0%	0%
Workload	2	50%	0%	0%	16,6%

3.7. Average of best practices applied in the ITGEP

Once the ITGEP has concluded, certain preliminary conclusions can be drawn regarding the best practices of corporate governance of IT that are applied in all three universities. Figure 3 shows that for the principles of *Responsibility and Strategy* 1 in 3 of the best practices proposed by GTI4U are implemented, while for the other principles the rate of implementation falls to 1 in 4.

These results clearly indicate that the universities taking part in the ITGEP are in the early stages of implementing the best practices related to IT governance. This does not mean that they take their responsibilities lightly, nor that their IT policy is inadequate. However, they would be well advised to formalise their corporate governance of IT and implement the best practices of reference.

Figure 3. Mean application of best practices of corporate governance of IT in the universities taking part in the ITGEP
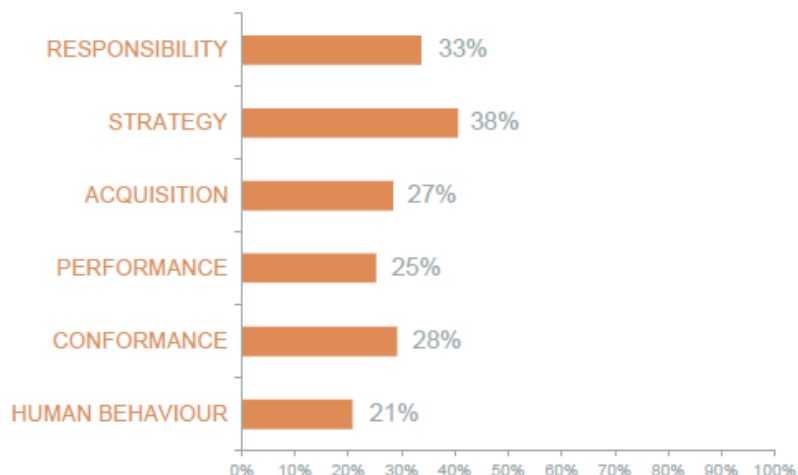
4. CURRENT MATURITY OF IT GOVERNANCE IN THE ITGEP

This stage aims to analyse the *current maturity* of corporate governance of IT for each of the principles included in the ISO 38500 standard taking as reference the maturity models proposed by GTI4U.

To this end, the members of the ITGC respond to a survey on maturity which automatically establishes the level of maturity in relation to the reference model proposed by GTI4U. Each maturity model includes 6 possible levels (from 0 to 5), and it should be remembered that this scale measures a degree of maturity in continuous progression, i.e. there is no mean value that should be considered as satisfactory:

- Inexistent (0), the university is unaware of this principle and their need for it.
- Initial (1), the principle is established but applied in a disorganised, *ad hoc* manner.
- Repeatable (2), the principle has not matured, but processes do follow a regular pattern.
- Defined (3), the principle is maturing, the processes are documented and conveyed.
- Measurable (4), the principle is at a mature stage, the processes are monitored and measured.
- Optimal (5), the principle is applied optimally, the processes are based on best practices.

Table 8. Maturity of Corporate governance of IT. Current state and targets.

	Current	Target	Current	Target	Current	Target	Mean
	A		B		C		ITGEP
RESPONSIBILITY	2	2	2	3	1	2	1,66
STRATEGY	1	2	2	3	1	1	1,33
ACQUISITION	1	2	1	2	1	2	1,00
PERFORMANCE	1	2	1	2	1	2	1,00
CONFORMANCE	0	2	0	1	0	2	0,00
HUMAN BEHAVIOUR	1	2	1	3	1	2	1,00

This stage included a process of consensus based on the opinions of the different ITGC members, as a result of which a single value was obtained for each principle for the whole university (Table 8).

The results indicate that the current state of corporate governance of IT can be classified as Initial in all three universities, as the maturity levels obtained are at the lower levels of the scale, in no case higher than level 2.

5. IMPROVEMENT PLAN FOR IT GOVERNANCE IN THE ITGEP

The final stage of the ITGEP consisted of designing an Improvement Plan for IT Governance (IPITG) for each university that took part.

To do so, each university first had to set their short-term (1 to 2 years) goal for maturity of IT governance. In setting this target, the ITGC members considered both the current situation as revealed in the previous stage and the strategic objectives designed by the university for the near future. The final values of their deliberations also appear in Table 8.

The ITGC then had to agree on a set of improvement actions to enhance maturity and attain the target level.

GTI4U defines the relationships between each of the items included in its maturity models, while also listing a set of actions required to achieve the different levels of maturity (compiled from the major reference frameworks published). As such, GTI4U offers users an easily accessible initial list of improvement measures. However, the ITGC must ensure that any actions they wish to adopt from the list proposed by GTI4U are in line with the current institutional strategy of their university before completing the final draft of the improvement plan.

In short, IPITG is basically a list of improvement actions, duly prioritised and planned, together with a detailed proposal of the governance decisions that are required to ensure that they are correctly carried out.

Finally, the IPITG was presented to the Governance Team of each university for approval.

6. CONCLUSIONS

The main contribution of the ITGEP is related to the GTI4U reference framework and its complementary tools, since this pilot project has allowed them to be applied for the first time in three Spanish universities, providing valuable experience on which to build in the future. GTI4U caused a fovourable impression on the ITGC of the universities that took part in the project. Indeed, a concluding survey which measured their satisfaction on a scale of 0 to 5 gave the following scores: the GTI4U reference framework covers all aspects of corporate governance of IT (4.5); it provides guidance to users regarding the best practices to carry out (4.5); the maturity models prove useful for establishing the current level of maturity of corporate governance of IT (4.6); the actions proposed by GTI4U are useful for improving corporate governance of IT in the university (4.3). Moreover, ITGC members have described GTI4U as a "reference of the highest calibre", considering that it aims for the highest possible level of corporate governance of IT and that the improvement actions it recommends are in line with the most demanding professional practices. GTI4U and its tools have been improved by the suggestions received during this pilot process, and it is now available in an enhanced version which we consider to be more robust than the previous one (www.gti4u.es).

The process designed for the implementation of the ITGEP has proved efficient, obtaining a score of 4.3 out of 5, and the ITGC recommend other universities to carry out similar processes (4.6).

One of the main assets of the ITGEP is that it has allowed the participants to become aware of the advantages that a corporate governance of IT system can bring to their universities, to verify their current level of maturity in relation to ISO 38500 and to understand which best practices are most appropriate to improve that level. To our mind, the most important change is that university directors have a better understanding of the importance of IT governance, and they have accepted their responsibility for implementing an efficient corporate governance of IT system that enhances the value of the ongoing processes in their university.

The Governance Teams of the different universities have given their full support to the ITGEP. The Rectors/Vice-Chancellors themselves have led the initiative by actively involving their teams and the members of the ITGC. We believe that this is the key to the success of the project, since the reference framework and its tools would be worthless without this.

We have discovered that the three universities involved are proactive, innovative institutions as far as corporate governance of IT is concerned, as we suspected from the outset due to their interest in participating in this project.

The results shows that the universities' level of maturity and application of best practices related to corporate governance of IT are at the lower levels of the scale. We should bear in mind that GTI4U proposes demanding levels of maturity that aspire to excellence, and that the Yanosky and Borreson (2008) study, albeit using a different scale, set the mean international maturity of corporate governance of IT for universities at 2.3. Consequently, the results obtained should not be considered as low (they are close to 2), but rather as acceptable, since they are a preliminary self-assessment within the framework of an initial project.

It is important to bear in mind that the true potential of corporate governance of IT of these universities cannot be established at present, rather it will become apparent over the coming months, as the improvement actions are put into practice with a view to attaining greater maturity. If the current level of corporate governance of IT proves sufficiently robust, the improvement actions will be easier to apply and the targets set will be achieved in due course. Given the universities' commitment to current and permanent improvement, we are convinced that in the medium term they can achieve a higher level of maturity that will enhance their organisations.

The aim of both the CRUE and the authors of the present paper is that the ITGEP should become a sound reference experience and that many other universities should follow this lead and commit to improving their corporate governance of IT.

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