



## Maintaining a sustainable Future for IT in Higher Education

Wednesday 15th June 2011

Time: 15:00 - 15:30

### **kTI, A Self-Assessment IT Governance System**

#### **Abstract**

In recent years, Information Technologies (IT) have evolved from being a tactical tool to becoming a strategic element. IT should be incorporated into planning and governance by establishing IT goals aligned with the corporate goals of each university.

Therefore, the Spanish Association of University Rectors (CRUE in Spanish) has promoted the UNIVERSITIC project to analyse the situation of IT in Spanish universities with a common catalogue that includes three types of indicators: IT Description, IT Management and IT Governance. These last indicators are part of an IT governance framework (named GTI4U) developed by the CRUE specifically for universities.

A web application, known as kTI, has also been designed and developed to manage the assessment process based on UNIVERSITIC indicators. kTI allows the compilation and automated analysis of the values of these indicators. The information collected allows us to ascertain the recent state of IT and to establish the level of IT governance maturity (in relation with the ISO 38500 standard) of each university and of the Spanish Higher Education System as a whole.

This paper includes a brief presentation of the UNIVERSITIC project and the GTI4U model and finally describes with detail the main features and functions of the kTI system.

It should be noted that the kTI system is easy to test as it is available in English and it can be used in SaaS (Software as a Service) or carrying out a local installation on your campus. If you are interested to know kTI better contact us at [universitic@crue.org](mailto:universitic@crue.org).

## 1. UNIVERSITIC

Spanish Association of University Rectors (CRUE in Spanish) has promoted a project called UNIVERSITIC to analyse the situation of IT in Spanish universities. This report is currently five years old and you can find the results at [www.crue.org/Publicaciones/universitic.html](http://www.crue.org/Publicaciones/universitic.html) (only in Spanish).

In 2011, CRUE has redesigned the common catalogue of IT indicators included in UNIVERISTIC, and now include three types of indicators:

- IT Description indicators, whose aim is to establish a broad description of the main university IT. In essence we get an inventory of technologies.
- IT Management indicators, to establish what are the best practices, drawn from major international frameworks, that are taking place at the university in the field of IT management.
- IT Governance indicators, seeking to survey the indicators proposed by the model GTI4U to establish what are the best practices being implemented and determine what level of maturity has reached the university in relation to the principles of IT governance proposed by the international standard ISO 38500 (2008).

The following section explains in detail the model GTI4U.

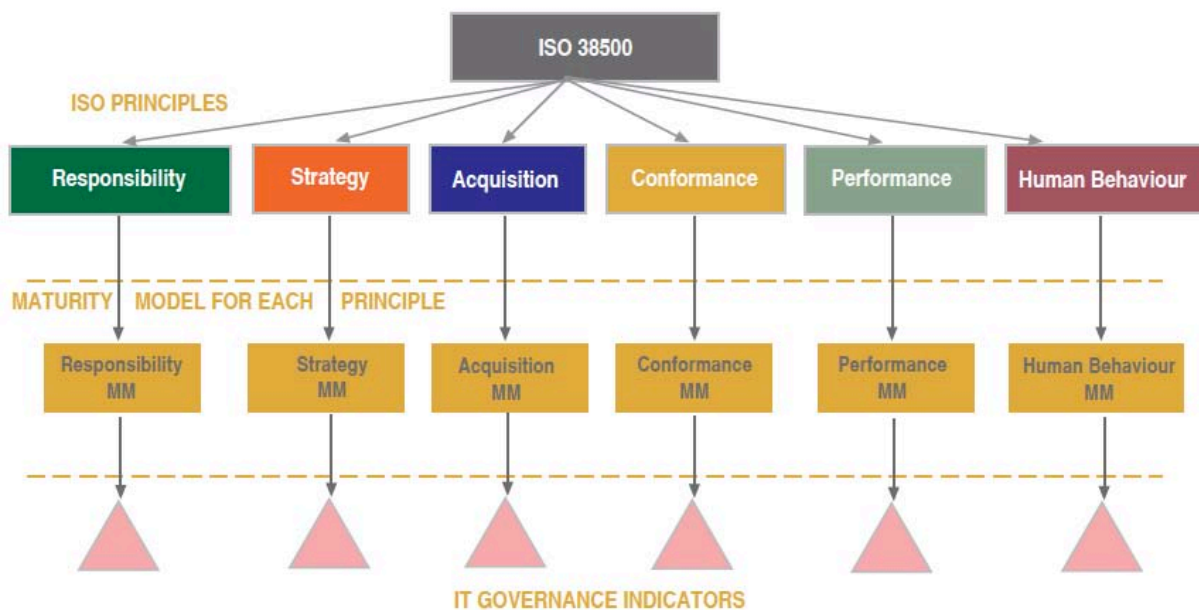
## 2. IT GOVERNANCE MODEL FOR UNIVERSITIES (GTI4U)

On an international level, there are numerous universities that have implemented IT Governance within their campuses: some have used COBIT to implement it, for example South Louisiana Community College (Council, 2006); others have designed their own IT governance models based on literature, for example the University of California (2008) which includes elements from an IT Governance model in its IT Strategic Plan; Pretorius (2006) has designed a more practical and less academic model for the University of Pretoria; Ridley (2006) has proposed an IT Governance model based on Weill & Ross (2004) for the University of Guelph; and the University of Calgary (2007) has implemented an excellent model.

The first initiative in the design of an IT Governance model which provides a reference for the whole university system was that undertaken by the Joint Information Systems Committee (JISC) for universities in the United Kingdom. This committee designed a reference model (JISC, 2007a) and a toolkit (JISC, 2007b) for the self-evaluation of IT Governance maturity, which has become a starting point in helping universities in the process of identifying and defining the IT role within the planning and governance of their organization. This framework was designed to be highly flexible and able to be used by different types of university: large or small, old or modern and to take into account the different cultures which prevail in the institutional governing of universities. This model is a very good reference and its only problem is that it does not include ISO 38500 elements.

Using these previous experiences as a starting point, Fernández (2009) developed for CRUE a University-oriented IT Governance Framework (GTI4U in Spanish). This framework is based on the JISC model and describes the principles and characteristics of the new international standard ISO 38500. But this first version has been validated for a long time and Fernández (2011) presented at the beginning of this year a new version (but is not the final one because this model is alive).

**Figure 1. IT Governance Framework for Universities (GTI4U)**



The current version of GTI4U framework is divided into three levels (Figure 1):

- In the first level, ISO 38500 elements appear. Here, you can find the ISO 38500 IT governance model that includes three main actions (evaluate, direct and monitor), the 6 principles of this standard (Responsibility, Strategy, Acquisition, Performance, Conformance and Human Behavior) and the recommendation guides for each principles.
- At the next level, has been designed a description of a maturity model for each of the principles.
- At the bottom level, several IT governance indicators have been included which will be use as evidence for complete maturity models of the previous level.

## 1.1. A MATURITY MODEL FOR EACH PRINCIPLE

Our aim is to operate with a maturity model similar to that of COBIT (with values between 1 and 5) in such a way that, when carrying out the self-assessment process, each university will have to determine the status of each of the principles within this model.

So, in order for the response to be uniform, we produced 6 tables which each one describes the different maturity levels for one of the principles of the ISO 38500.

Figure 2 shows part of the table for the principle Responsibility. At the level 0 you can find a description of a situation where the university doesn't know the IT principle. At the second level the principle is established, but with disorganized and *ad hoc* processes. The situation is better at the following level but only at the level 5 the status is optimums because the IT governance is based on the best practices.

Users of maturity models should determine at what level is the university and can only acquire a level if it meets each of the features that are described at this level.

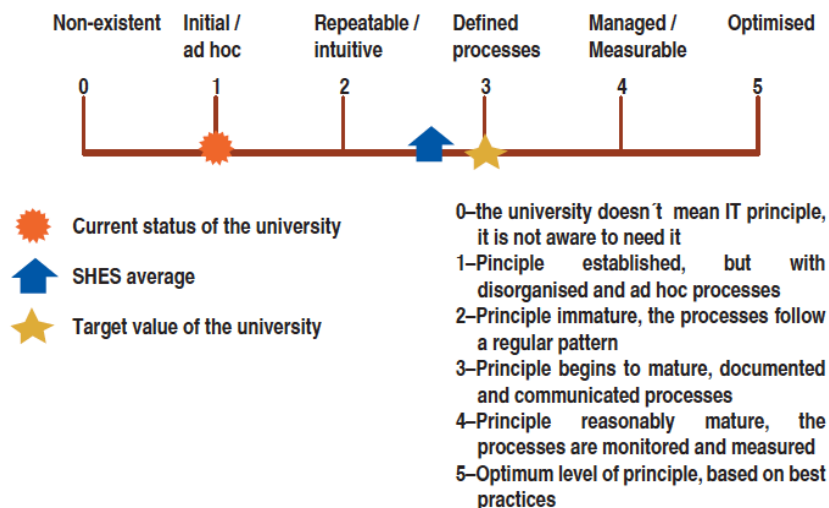
A graphic model with icons is used to show the maturity level of each principle (Figure 3). In this model is representing the average value for Spanish High Education System (SHES) and also the

target value that the university wants to achieve through the implementation of improvement actions.

**Figure 2. Maturity Model for the principle Responsibility**

	Evaluate	Direct	Monitor
<b>0</b>	Directors have not been assigned responsibilities in relation to IT	Directors do not make decisions related to IT	Directors don't monitor the performance of persons responsible for IT
<b>1</b>	Directors have been assigned responsibilities related to IT management Directors assign responsibilities based on their own criteria because don't know reference models	Directors oversee the management of IT but not in a planned way  Most decisions are made by IT managers and confirm later by Directors	Directors carry out informal monitoring responsibilities related to IT management
...			
<b>5</b>	Directors regularly review the models and options to assign responsibilities	Directors have ensured that the entire university is involved in IT governance  Directors receive the information they need to make decisions and promote the pursuit of other interesting information proactively  Directors communicate the results of the IT governance processes compared to other universities	Directors periodically measure the maturity of the IT governance mechanisms  Directors periodically checks if are been understood and been executed the responsibilities assigned or reassigned  Directors monitor the performance of persons responsible for IT and communicate the results to the stakeholders

**Figure 3. A graphical model to show the maturity of each principle**

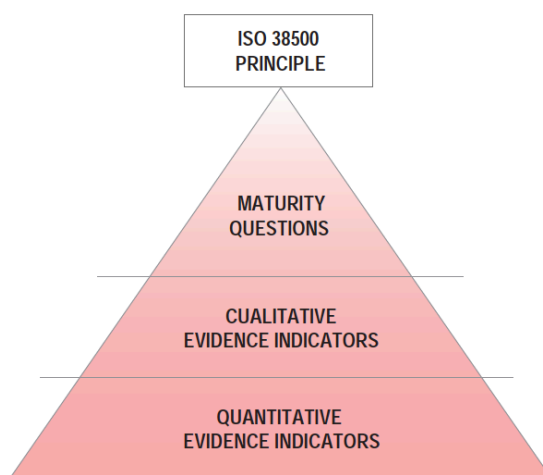


## 1.2. IT GOVERNANCE INDICATORS

In order to measure the level of maturity, a set of indicators for each principle is established which is made up of three types of indicator (Figure 4):

- Maturity Questions; a set of questions that try to discover what is the right maturity level of the university in relation with the Maturity Model predefined, for example “Have been assigned responsibilities in relation with IT?”
- Qualitative Evidence Indicators; this indicators ask the user about if the university is using the best IT practice, for example “Has elaborated the university an IT strategic plan?”
- Quantitative Evidence Indicators; a quantitative indicator uses to be related to a qualitative indicators “How often are IT strategies reviewed? (in years)”

**Figure 4. IT Governance indicators of GTI4U**



## 3. KTI: A SELF-ASSESSMENT IT GOVERNANCE SYSTEM

kTI is a web software developed in 2011 by CRUE. Its main objective is to facilitate the analysis of the maturity of the implementation, management and governance of the IT, thus covers all aspects of IT within an organization.

To perform this analysis, an organization can design its own set of IT indicator or use those already included in kTI. In the first case, once designed her own catalogue the user must create a new catalogue in kTI and fill it with the definitions of new indicators.

kTI allows an analysis of the IT maturity of a single organization or set of them at once. This second option makes it easy to compare the results of each organization in relation to the results of the group.

To carry out a survey, a campaign must be set. This include established initial and final date; determine which organizations will participate; select the catalogue of indicators to be used; and decide which of three possible phases will be carried out (IT description, IT management or IT governance). Once launched the campaign manager can track it and will know how each organization interacts with the system.

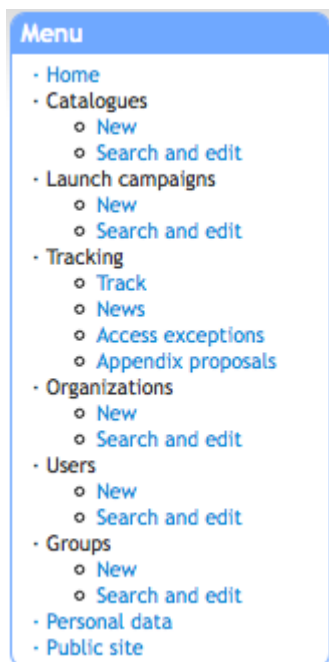
At any time during a campaign, the application users have feedback that tells them what is the status of your organization in relation to all the organizations surveyed. Also offers historical information about the evolution of the value of an indicator and provides dashboards to display the values of the indicators you want. At the end of the campaign, you can export the results to the spreadsheet format to perform advanced analysis afterwards.

Everything said so far can be found in other popular applications. But what really characterizes it and makes it unique is that kTI includes a tool for self-assessment of the maturity of IT governance in an organization.

Initially, kTI offers the possibility to carry out the self-assessment using the GTI4U model described above, but is flexible enough to implement other models. So the evaluation must establish the maturity level of a university in relation to the principles of ISO 38500 and kTI thus becomes the first system capable of achieving.

In order to better understand kTI, in the following sections describe in detail the main features of this system, which also can see in the administration menu shown in Figure 5.

**Figure 5. Administration menu options of kTI**



### 1.3. CREATE NEW CATALOGUES OF IT INDICATORS

To study the state of IT, an organization can use IT indicators catalogues offered by kTI or create its own catalogue. It is very easy to create a new catalogue in this system and form provided to describe a new indicator is quite comprehensive.

kTI has been designed and developed to manage the assessment process based on UNIVERSITIC 2011 indicators (presented above). So initially offers three catalogues: IT Description indicators, IT Management indicators and IT Governance Indicators.

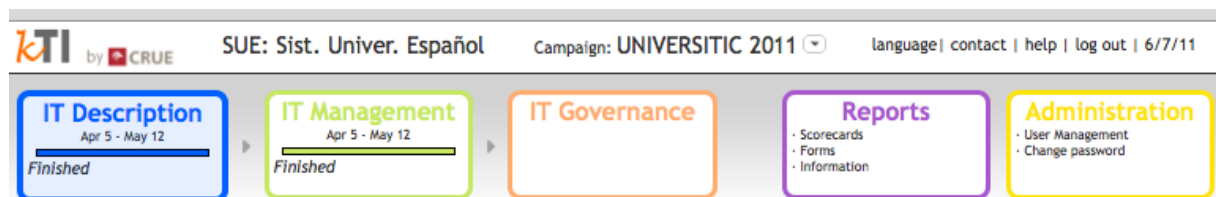
## 1.4. LAUNCH CAMPAIGNS TO ESTABLISH THE STATUS OF IT IN AN ORGANIZATION

To carry out the analysis of the situation of IT in an organization should set up a campaign at kTI, this includes:

- To set start and end dates of the campaign, Figure 6 shows how over the first two phases.
- To determine the participating organizations, organizations which must have been introduced previously in kTI.
- To select the catalogue of indicators to be used, among those included in kTI, so if you want to use your own catalogue you must create it and fill in kTI.
- To decide which of three possible phases will be carried out (description, management and/or governance). Figure 6 shows that UNIVERSITIC 2011 campaign has used Description and Management phases, but no Governance phase. kTI allows that these phases can be carried out simultaneously or sequentially in time.
- Once launched the campaign, an user can track it at all times to know how each organization interacts with the system.

Initially the main objective of kTI is provide support to the analysis of IT CRUE performed annually and this is reflected directly in its main menu (Figure 6) where appears the three phases of the campaign UNIVERSITIC 2011.

Figure 6. kTI main menu

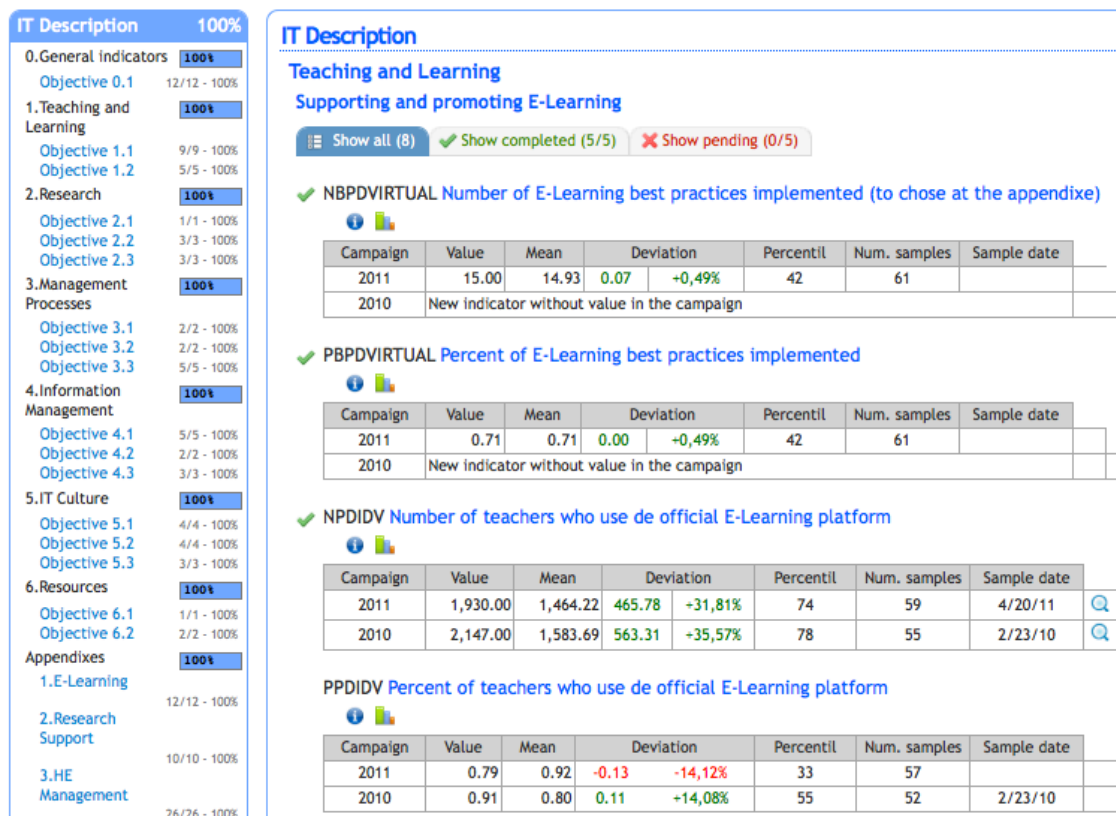


## 1.5. COLLECT AND SHOW THE EVOLUTION OF THE VALUES OF INDICATORS

kTI allows that during a campaign the user can:

- Insert the values of the IT indicators and compare these with the average of the Spanish University System (SUE in Spanish). Figure 7 shows the appearance of the window dedicated to insert. On the left appears a menu with the axes and strategic objectives of the IT Description catalogue. Next to each objective shows the number of component indicators and the percentage of values entered. To the right is a brief description of the indicator and a table with its value and a range of statistical information has been calculated by the application to keep users well informed (mean, deviation, percentile, etc.).
- See the historical of each indicator. Figure 8 presents a chart with an orange line showing the evolution of indicator value in the University and another in blue indicating the SUE average.

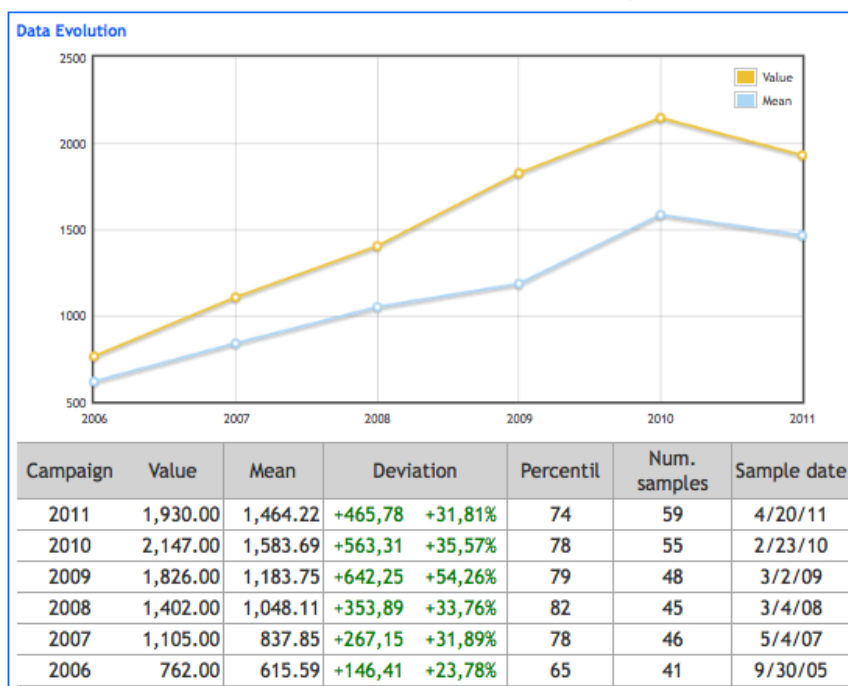
**Figure 7. Window to insert the value of indicators**



- Arrange the values of the indicators in a scorecard, which should help the university managers to better understand the IT situation in order to make the right decisions. Figure 9 shows how the indicators are red whose value is below the SUE average and green which are above. You can customize the look of the scorecard and hide and display axes, objectives or indicators. You can also generate new scorecard, either from scratch or from an existing one.

**Figure 8. Historical**

NPDIDV Number of teachers who use de official E-Learning platform



**Figure 9. IT Governance Framework for Universities (GTI4U)**

## Scorecards

Select scorecard Variables UNIVERSITIC 2011

### Variables UNIVERSITIC 2011

Todos los indicadores tipo variable que se han introducido

#### Summary

Positive deviation: 74 (57.81%) Negative deviation: 50 (39.06%)  
 No available: 4 (3.12%) No filled: 0 (0.00%)

#### IT Description

##### D. General indicators

##### 1. Teaching and Learning

##### 1.1. Supporting classroom learning with IT

NAULASB	458.00 (+79,39%)	NAULASA1	99.00 (+323,15%)	NAULASA2	10.00 (-40,44%)
NAULASA3	0.00 (-100,00%)	NOLIBRE	1,249.00 (+68,41%)	NPORTATILES	168.00 (-76,11%)
NPAULAMOVIL	455.00 (+516,87%)	NCONWIFI	4,456,968.00 (+130,52%)	NUSUARIOSWIFI	29,826.00 (+109,59%)

##### 1.2. Supporting and promoting E-Learning

NPDIDV	1,930.00 (+31,81%)	NEDV	27,076.00 (+35,94%)	NTTULANP	0.00 (-100,00%)
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kTI allows exporting results to other formats (xls or pdf) to facilitate its dissemination and further analysis.

The information collected will allow us to ascertain the recent status of IT of each university and of the SUE as a whole.

## 1.6. GET A SPECIFIC VALUE FOR THE MATURITY OF IT GOVERNANCE PRINCIPLES OF ISO 38500

The great novelty of KTI, which makes a single application, is that it includes a self-assessment tool on the maturity of IT governance in an organization. This self-assessment is based on the model GTI4U, and offer as a result the level of maturity of each of the principles of ISO 38500 at the University analyzed.

While at the Description and Management phase each organization must enter into the application a single value for each indicator, at the phase of IT Governance, directors must insert each one their opinion. KTI facilitates the dynamics of consensus in order to obtain a single value from those provided by different managers in a university.

Figure 10 shows how KTI automatically proposing consensus ("proposed consensus" column) by the logic that is programmed. Later ITG Committee members should discuss and agree on a single value to be entered in the "Agreed consensus" column.

**Figure 10. Consensus window**

Consensus of Evidence Indicators														
Members of ITG Committee:	1	2	3	4	5	6	7	8	9	10	11	12	PROPOSED CONSENSUS	AGREED CONSENSUS
RE1	Ns	Ns	Ns	No	Ns	Nc	No	Ns	No	Nc	Nc	Nc	No	No
RE2	Ns	No	Ns	No	No	Nc	No	No	No	Nc	Nc	Nc	No	No
RC1	ND	Nd	ns	10	ND	ND	4	ND	ND	ND	ND	ND	7	7
RE3	No	Yes	Yes	No	Yes	Nc	Yes	Ns	Yes	Nc	Nc	Nc	No	Yes
RE4	No	Yes	Ns	No	Yes	No	No	No	No	Nc	Nc	Nc	No	No
RE5	No	No	No	No	Ns	No	Yes	No	No	Nc	Nc	Nc	No	No
RE6	No	No	Ns	No	No	No	No	No	No	Nc	Nc	Nc	No	No
RE7	No	No	Ns	No	Yes	Nc	Yes	No	Ns	Nc	Nc	Nc	No	No

The logic determines a value of maturity for each of the principles of ISO 38500 from the agreed values and the result is displayed as icons dashboard similar to that shown in Figure 3. In this graph appears the value of the maturity of this principle for our University and SUE average.

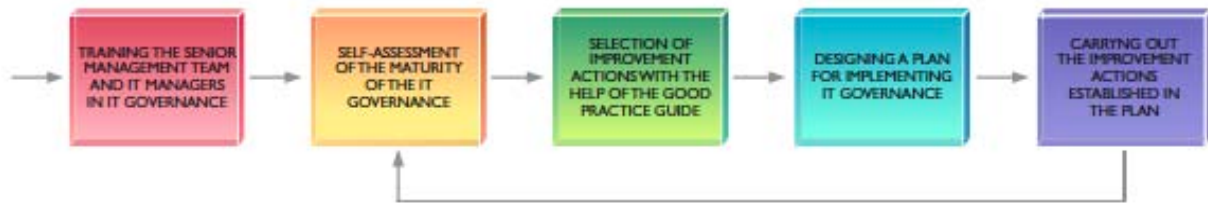
To conclude with the presentation of KTI, it should be noted that the KTI system is easy to test as it is available in English and it can be used in SaaS (Software as a Service) or carrying out a local installation on your campus.

## 4. PILOT PROJECT TO EVALUATE THE MATURITY OF IT GOVERNANCE AT SUE

CRUE has recently launched a pilot project to evaluate the maturity of IT governance at four universities (Alicante University, Murcia University, Jaume I University and Polytechnic University of Cartagena) using the model GTI4U. This project will finish after this summer (2011).

Figure 11 shows the main steps of the implementation of the pilot project in each university.

**Figure 11. IT Governance Framework for Universities (GTI4U)**



This process is based on the recommendations of Van Grembergen & De Haes (2008) which established “steps when implementing an IT governance system in an organisation: training the IT managers in IT Governance, analysing and understanding the initial situation of IT Governance (self-assessment) and designing a plan for implementing IT governance to achieve the target status for the organization.”

As KTI is a system that facilitates self-assessment of the maturity of IT governance will be very useful to carry out the second phase of this process.

## 5. CONCLUSIONS

CRUE has promoted the creation of three catalogues of indicators (description, management and IT governance) and is used to carry out the project UNIVERSITIC that aims to annually review the status of IT in each of the Spanish universities and throughout the Spanish University System (SUE).

To carry out this study, KTI has been developed and it uses to easily survey description and management indicators but also has become the first system that allows you to perform self-assessment of the maturity of each of the principles the ISO 38500 standard.

So SUE will now have common tools to provide information in order to compare universities and to help design global improvement actions. On the other hand, as long as the model GTI4U and KTI system are reasonably general, other European universities will be able to use it without having to make significant changes. At least it will provide a good reference and the experience gained through its implementation may be taken into account in the design of their IT governance frameworks.

The results of the pilot project will serve to validate the catalogue of indicators of IT governance and also validate the operation of KTI. From this experience both tools were improved and new versions of both will be published in early 2012.

Therefore, it is expected that the results of this pilot project will become a good reference for the rest of SUE universities are encouraged to carry out similar processes.

If you are interested in more information about UNIVERSITIC project, GTI4U model or KTI system please contact us at [univerisitic@crue.org](mailto:univerisitic@crue.org).

## 6. REFERENCES

- ❖ Coen, M. & Kelly, U. (2007), Information Management and Governance in UK Higher Education Institutions - Bringing IT in from the cold. *Perspectives: Policy and Practice in Higher Education*, 11 (1). pp. 7-11, from: [http://eprints.cdlr.strath.ac.uk/3104/01/CoenKelly\\_bringing\\_IT\\_in\\_from\\_the\\_cold.pdf](http://eprints.cdlr.strath.ac.uk/3104/01/CoenKelly_bringing_IT_in_from_the_cold.pdf)
- ❖ Council, C. L. (2006). Implementing COBIT in Higher Education: Practices that work best. *Information Systems Control Journal*. ISACA, from: [www.isaca.org](http://www.isaca.org)
- ❖ Fernández, A. (2009). *Análisis, Planificación y Gobierno de las TI en universidades*. Ph. D. Defense. Universidad de Almería.
- ❖ Fernández, A. (2011). Capitulo 10. Modelo de Gobierno de las TI para la Universidades (GTI4U). *Gobierno de las TI para Universidades*. Fernández, A y Llonres, F. CRUE.
- ❖ ISO 38500 (2008). *ISO/IEC 38500:2008 Corporate Governance of Information Technology*. ISO/IEC. 2008, from: [www.iso.org](http://www.iso.org)
- ❖ ITGI (2007). *CobiT 4.1*. Rolling Meadows, IL: IT Governance Institute, 2007, from: [www.itgi.org](http://www.itgi.org)
- ❖ JISC (2007a). *A Framework for Information Systems Management and Governance*. Joint Information Systems Committee (JISC), from: [www.ismg.ac.uk/Portals/18/Governance%20Framework.pdf](http://www.ismg.ac.uk/Portals/18/Governance%20Framework.pdf)
- ❖ JISC (2007b). *A Framework for Information Systems Management and Governance: Self-Assessment Toolkit*. Joint Information Systems Committee (JISC), from: [www.ismg.ac.uk/Portals/18/Governance%20Toolkit.pdf](http://www.ismg.ac.uk/Portals/18/Governance%20Toolkit.pdf)
- ❖ Petrorius, J. (2006). *A Structured Methodology for Developing IT Strategy*. *Proceedings of the Conference on Information Technology in Tertiary Education*. Pretoria.
- ❖ Ridley, M. (2006). *Information Technology (IT) Governance*. A position paper.
- ❖ University of Calgary (2007). *IT Governance Model*. University of Calgary, from: [www.ucalgary.ca/pmo/itgovernance/model](http://www.ucalgary.ca/pmo/itgovernance/model)
- ❖ University of California (2008). *Strategic Information Technology Plan, 2008-2009*. University of California, Berkeley, from: <http://technology.berkeley.edu/planning/strategic/>
- ❖ Van Grembergen, W. & De Haes, S. (2008). *Implementing Information Technology Governance. Models, Practices and Cases*. IGI Publishing.
- ❖ Weill, P. & Ross, J.W. (2004), *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results*. Harvard Business School Press. 2004