THE UNIVERSITY OF THE XXI CENTURY: INTELLECTUAL CAPITAL AS A NEW ANSWER FOR MANAGEMENT

USEFULNESS, COMPARABILITY AND DISCLOSURE FROM THE “OBSERVATORY OF THE EUROPEAN UNIVERSITY” PROJECT EXPERIENCE

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1. Introduction

European universities and research centers are considered crucial for the creation of the *Europe of Knowledge* (European Commission, 2003) and for the development of modern societies in general. In line with this, and since the end of the last decade, our Higher Education (HE) systems are immersed in an intense transformation process\(^1\), which endeavours to make universities more flexible, transparent, competitive and comparable. To face these challenges, managing universities under efficiency and effectiveness criteria has become crucial. In this line, some scholars consider that traditional universities’ governance modes are not completely able to run these organisations accordingly with these criteria and, as a result, new managerial skills and practices are required (Amaral et al., 2003). Despite the application of managerial ideas to HE institutions has created enormous controversy within the academia, since the end of the 80s, efficiency and effectiveness, accountability, development of strategic plans, total quality management, or teaching and research auditing procedures have become important tools to govern these institutions.

Considering the importance of intangible assets for universities and research organisations, we claim that Intellectual Capital (IC) approaches are a suitable tool for universities in order to improve internal management and to disclosure information to stakeholders. Indeed, it is a fact these approaches are gaining importance day by day as a tool for measuring and reporting on intangibles not only at firm level but within universities and research organisations. Supranational organisations as OECD, the European Union or the World Bank are showing an explicit interest on this issue organising working groups, international conferences, etc. In the realm of practice, a prove of this interest is reflected on the different initiatives developed with European universities and research centers\(^2\).

Accordingly, the first aim of this study has been to identify the necessity of new models of management in universities. The second aim has been, once identified this necessity, to provide an initial framework for the disclosure of IC within universities and research centres: The Intellectual Capital Report for Universities (from now ICU Report). Finally, the third main aim of this work has been to assess the usefulness and suitability of this ICU framework in the specific case of the Autonomous University of Madrid (UAM).

The remainder of the paper is structured as follows. In Section 2 we reflect on why this framework has become increasingly important for HE and research institutions. Attending these reasons, it is argued that IC seems to be a potential answer for contemporary universities to improve their internal management and transparency level. In section 3, the benefits of IC Report as a tool for managing and reporting on intangibles are described. In the attempt to build an effective tool for the disclosure of IC within universities, we have focused on four main documents of reference, which are concisely exposed. A tentative proposal of the ICU Report is presented in Section 4, in the aim of providing a homogenized framework to diffuse IC information within HE institutions. Furthermore, we present a system of indicators specifically designed for these organizations.

This model has been tested against a survey carried out among fourteen decision makers at the UAM, one of the most pro-active participants of the Observatory of European Universities (OEU). By doing so, we try to evaluate the usefulness for management of a pile of selected indicators, identify the UAM “styles of governance”, and assess possible barriers for the disclosure of indicators. Section 5 describes this exercise, focusing on the usefulness

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1 The so-called Bologna process (Bologna Declaration, 1998).
and suitability of this ICU framework in the specific case study selected. Finally, some conclusions of the survey and further research lines are discussed.

2. Rationale of managing and reporting on their Intellectual Capital within Higher Education institutions

Intellectual Capital (IC) has been defined as the combination of intangible resources and activities that “allows an organisation to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value” (European Commission, 2006, p. 4).

Although different taxonomies of Intellectual Capital exist, the term is often defined as the combination of an organisation’s Human, Relational and Organisational resources and activities (European Commission, 2006). However, IC is more than the sum of these three elements; “it is about how to let the knowledge of an organisation work for it and have it create value” (Roberts, 1999).

Firstly, Human Capital is defined as the knowledge that the human resources would take with them if they leave the institution. In the case of universities and research organisations: professors, researches, PhD students and administrative staff.

Secondly, Organisational Capital is defined as the knowledge that stays within the institution at the end of the working day. Regarding HE institutions, the governance principles and modes, the organisational routines and procedures, culture systems, databases, and intellectual property are especially significant.

Finally, Relational Capital is defined as all resources linked to the external relationships of the institution such as “customers”, “suppliers”, R&D partners, Government, etc. This category could be assimilated in the so-called Third Mission of the universities, which includes all the activities and relations between the university and non-academic partners: firms, non-profit organisations, public authorities, local government, and society as a whole.

Within each category it is important to distinguish between financial and non-financial aspects (meaningful when talking about public universities which main goals are non-profit), as well as between resources and activities. The later classification was defined by the MERITUM project (2002) as follows:

- Intangible resources (static notion) are the stock or current value of a given intangible at a certain moment in time. They may or may not be expressed in financial terms. The resources can be both inputs (researchers, for instance) or outputs (publications, patents, spin-offs).
- Intangible activities (dynamic notion) imply an allocation of resources aimed at: developing internally or acquiring new intangible resources, increasing the value of existing ones, or evaluating and monitoring the results of the former two activities.

The activities give revealing insights into the expected evolution of IC linked with the organisation’s strategic objectives. For example, patents, publications or spin offs are the results of previous activities. At a given moment, they are the resources (the assets) of the institution. However the mechanisms to encourage researchers to patent, to publish or to create spin offs are activities that may improve such resources. The investment of the University to foster these activities reveals its strategy and provides some hints about its future prospects.
Given the new challenges that European universities are facing since the end of the 80s decade, managing and reporting on intangibles and IC have become increasingly important attending the following reasons:

(a) Universities’ main inputs and outputs are basically intangibles (mostly knowledge and human resources). However, only a small part of these are identified and very limited instruments exist to measure and manage them (Cañibano y Sánchez, 2004).

(b) Because of the new pressures for accountability within public institutions, universities and research centers are forced to be more transparent and to disseminate more information to stakeholders (students, public authorities funding universities, labour market, and society as a whole). As asserted by the European Commission (2003; p.13) “universities have a duty to their stakeholders to maximise the social return of the investment”. However, despite the increase in external demands for greater information and transparency on the use of public funds (Warden, 2003), an empirical study carried out throughout different universities in Australia, Canada, France, Germany, New Zealand, Spain, United Kingdom and USA confirms that most of them have not yet assumed generalised practices on the elaboration of external information reports (Campos, Noverto & Villanueva, 2003).

(c) HE institutions are being provided with more autonomy to manage their own affairs, not only academic but also financial, to redefine their own internal structures, which necessary requires new management and reporting systems

(d) Universities are becoming aware of this increasing competitive environment of the higher education system, and this competition appears to increase in the future (Cañibano and Sánchez, 2004). The globalisation processes, the increasingly competitive environment and the European Union requirements to create the European Higher Educational and Research Area process requirements are forcing universities to improve their attractiveness in order to get excellent students, researches and professors, and to compete for public and private funds to improve their activities.

(e) Finally, the increasing cooperation between universities and firms has had as a result the demand of similar processes of evaluation for both players. Accordingly, universities and research organisations have to implement new management and reporting systems, which should incorporate necessarily intangibles.

3. Reporting on IC: overview of the most relevant experiences

One concrete tool successfully applied within HE and research organizations is the Intellectual Capital Report (ICR), which is used to identify and deliver information about strategy, aims, visions, activities and resources, based on indicators (financial and non-financial). Accordingly, its benefits fall into two categories (European Commission, 2006 and Marr & Roos, 2005):

- One category is its potential to function as a management tool to help develop and allocate resources – create strategy, prioritise challenges to the firm’s development, monitor the development of the firm’s results, and thus facilitate decision-making (internal reporting function).

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3 See Austrian Research Centers or Austrian Universities experience
The other category is its potential to function as a communication device to the institution’s environment that can be used to attract resources – financial resources, human resources, relationships with partners and customers, and technological resources (external reporting function).

Therefore, IC information is conceived to complement financial management information (internally) and the financial report (externally). Moreover, this external information can facilitate benchmarking across institutions.

In this line, an ICR should give two different results. On one hand, an IC document for internal management. It will include information exclusively reserved for internal use, since it will comprise strategic and confidential information. And, in the other hand, an IC Report for public disclosure. It will be used as a form of communication, and therefore the contained information should be carefully selected.

Benefits of IC Reporting, externally and internally, are diverse. Internally, an IC Report can facilitate management decisions by improving understanding of the university’s activities and goals, by identifying intangible resources and capabilities and by improving investments and capital allocation. Externally, it helps to improve transparency with the society as a whole and to attract new employees, partners and collaborators (European Commission, 2006, p. 135).

From managing IC, the next logical step is disclosing some of this Intellectual Capital information. The disclosure of IC information is a powerful tool to communicate to society the institution’s abilities, resources and commitments in relation to the fundamental determinant of the institution’s value. Subsequently, an IC Report contains information on the work carried out by the institution in order to develop, maintain and manage its intangible resources and activities (MERITUM, 2002).

It is important to take into account that there must be a logical selection of what to measure. Not everything is useful for an institution, and can be very costly. Therefore, it seems necessary to make an effort in selecting appropriated indicators.

Although it is not the main purpose of this paper to present an exhaustive review of all the existing experiences and documents about reporting on intangibles, in the attempt to build an effective tool for the disclosure of IC within universities, we have focused on four main documents of reference, which are, in our view, the most representative works of the current trends in IC: Danish IC Guidelines, MERITUM Project, RICARDIS and Austrian Research Centers.

The document “Intellectual Capital Statements. The New Guideline” (2003), published by the Danish Ministry of Science, Technology and Innovation is the most contrasted document with companies at an international level.

The first guideline, which was published in 2000, was tested by 80 Danish firms in a follow-up project organised by the Danish Ministry of Science, Technology and Innovation in 2001-2002. This group of firms included both public and private sector organisations and firms of all sizes including several large companies listed on the stock exchange. Based on the experiences from those firms, a revised guideline was published in Danish in December 2002 (and later translated into English in February 2003).

The Danish IC guidelines are very complete and can be immediately applied as an instrument for the management and reporting on Intellectual Capital. They also acknowledge the need for knowledge management, a set of initiatives to improve it and a set of indicators to define, measure and follow up initiatives.
Regarding the MERITUM Project, it was funded by the European Commission V Framework Programme between 1999 and 2001. It developed 77 case studies in six European countries (Spain -coordinator-, France, Finland, Sweden, Denmark and Norway) and the main result was a set of Guidelines for measuring and reporting on intangibles in companies (MERITUM, 2002). It is the only experience on Intellectual Capital for companies at a European level. The final result of the project is a practical guide focused on the best practices of the participant firms and tested among experts through a Delphi analysis. Furthermore, it provides detailed suggestions for disclosure.

In December 2004, the European Commission set up a High-Level Expert group to propose a series of measures to stimulate the reporting of IC in research-intensive SMEs. The result was the above mentioned document RICARDIS (Reporting Intellectual Capital to Augment Research, Development and Innovation in SME’s) (European Commission, 2006). It constitutes the most recent document on Intellectual Capital issues developed by a supranational organisation. Its goal was to look for ways to promote the use of IC Reporting, on the assumption that this will increase R&D activities. In the Report, IC is considered a crucial factor in the knowledge-based economy, and subsequently its reporting by companies and other organisations, such as universities, becomes paramount. Accordignly, one of the recommendations proposed is to promote the elaboration of IC reports at universities and research centres (European Commission, 2006).

Finally, the Austrian Research Centers (ARC) is the most outstanding and longest experience in reporting Intellectual Capital in research centers, which has been publishing an IC Report for the last 7 years. Actually, ARC model and principles have become the main foundations for ICR of Austrian universities, which will become mandatory by 2007 (Leitner, 2005). By a legal reform of the HE sector which aims to enlarge the autonomy of Austrian universities, the Federal Ministry of Education, Science and Culture (2002) compel universities to submit an Intellectual Capital Report (ICR), which should include, as minimum, the following features (Universities Act 2002, Section 13, Subsection 6):

- The university’s activities, social goals and self-imposed objectives and strategies;
- Its intellectual capital, broken down into human, structural and relational capital;
- The processes set out in the performance agreement, including their outputs and impacts.

Analysing all these initiatives and endeavours, we believe that the European Union will follow a similar path to the one opened by Austria, as is suggested by the RICARDIS document (Sánchez and Elena, 2006). In this changing context, the need for measuring and managing intellectual capital in universities becomes crucial.


In this section, a proposal for the disclosure of IC information, focusing on research, of a university is presented. As mentioned before, although the ultimate goal of identifying and measuring IC is to improve internal management, the IC Report for disclosure seems to be the logical conclusion of the IC management process: communicating to stakeholders the university’s abilities, resources and commitments in relation to its strategy.
It is important to mention that the Observatory of European Universities (OEU) project has been the basis of this proposal mainly in the terms of indicators design and data gathering. The creation of this Intellectual Capital Report for Universities (ICU Report) for disclosure has been first undertaken by the UAM working group in order to be part of the guidelines that the OEU Project will publish.

Based on the analysis of the experiences above, we understood that there is a series of minimum requirements that any IC Report for universities has to fulfil:

- It has to be coherently related to the strategy of the institution. Any IC Report will have to be adapted in order to reflect the idiosyncrasy of a university.
- It needs a narrative to explain the missions of universities and their main concerns.
- It needs a system of indicators to set measurable objectives and goals. A system of indicators makes it possible to follow up whether the activities have been launched or whether these objectives are being met.
- The creation of an IC Report is a dynamic process, in which the university may learn. Therefore, it needs top authorities to engage with the project.
- The creation of an IC Report may pose a compromise for universities in the future.

It is crucial to highlight that we cannot forget the close relationship of management with measurement: any system of indicators is designed to be useful for management, and it should be reflection on how and in what extent management will use this system.

The next sub-sections try to give some insights about how to disclosure IC information within universities, providing recommendations about the structure and scope of the report, the selection of indicators, practical issues related to the data gathering process and the frequency of the report, and, finally, some methodological shortcomings about

4.1. Structure of the Report

The ICU Report has three different parts which in one way or another depict the logical movement from internal strategy (design of vision and goals of the institution) and management to the disclosure of a system of indicators for disclosure. These first two stages focus on coherently relating the strategy of an institution to the IC Report. Besides MERITUM and the Danish IC Guidelines, both the Australian and Japanese Guidelines strongly recommend including a narrative of the institution’s strategy at the very beginning of the document.

It is important to state that many indicators do not provide new information: most of universities have gathered information of some indicators (such as number of publications or patents) for many years. However, it has usually been done in an irregular and unsystematic way, and IC information is spread in a number of different documents. Therefore, the ICU Report must be regarded as being a new model to provide homogenised information and comprising the IC information in a single document.

The inclusion in the ICU Report of “something else” rather than quantitative information responds to a very important aim. Consequently, the descriptive elements become crucial to contextualize and understand better the information provided by the indicators. This narrative complements the quantitative information and is crucial to truly assess the meaning

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4 See next section for description of the Project
of each indicator. For example, the financial indicators that discriminate between fixed and free budget can be misleading. If a university had historic buildings (which is frequent in old universities), its fixed expenses in maintenance would be higher, regardless the constrains that are subject of this study. Therefore, the weight of free budget would appear smaller.

➤ Section 1. Vision of the institution

The mission statement of the institution (strategic objectives, strategic capabilities and key intangible resources) presents the institution’s main objectives and strategy and the key drivers (or critical intangibles) to reach these objectives.

Prior to the selection of indicators, the academic authorities should be aware of the necessity of defining the strategic objectives. As we will see, they will be the axes for the organisation of the ICU Report.

This section, also called the knowledge narrative (DMSTI, 2003), expresses the institution’s ambition to increase the value a user receives from their services. In this regard, the first section should answer some general questions such as the following:

✓ What main services does the organisation provide?
✓ What are the main objectives of the institution?
✓ What makes a difference with respect to other institutions?
✓ What resources (human, organisational and relational) are necessary to be able to reach the objectives and to provide the target services while ensuring quality?
✓ How are those intangible resources related to the value of the institution?
✓ What is the combination of tangibles and intangible resources that creates value?

Although the ICU Report is engaged with the disclosure of IC, it is also important to take into account the tangible resources that participate in the process of creating value. Moreover, it is the interaction among the different types of capital (Physical, Monetary and Intellectual Capital) what creates wealth within an organisation (Marr and Roos, 2005).

➤ Section 2. Summary of intangible resources and activities

This section focuses on the intangible resources the institution can mobilize and the different activities undertaken to increase the value of those resources. The goal of this part is to highlight the knowledge resources that need to be strengthened and to list the initiatives that have been taken, are in process or planned to improve these resources. The questions that this second section should answer are (DMSTI, 2003):

✓ Which existing intangible resources should be strengthened?
✓ What new intangible resources are needed?
✓ What activities can be launched?
✓ What activities should be prioritised?

In the case of universities, this section is of crucial importance, since each university must define its own areas of interest, strategic research lines or priorities, in order to look for few areas of excellence or spread its effort in a number of different areas of knowledge.

➤ Section 3. A system of indicators for the intangible resources and activities

The system of indicators endeavours to allow the members of the university and external parties to estimate correctly the future of the institution. In this sense, it is useful to both, external parties and to management alike, to disclose not only the indicator but also its
expected trend and its relation to the institution objectives. In this way, a university engages with measured and clear objectives that can be assessed over time. Moreover, a system of indicators makes it possible to follow up whether the activities have been launched or whether these objectives are being met. We consider a system of indicators essential in order to develop follow-ups of the university.

Regarding the system of indicators, we should keep in mind that the ICU Report does not provide activities-related indicators. This limitation will be explained in Section 4.6 when talking about methodological shortcomings. However, we consider that a first approach to the IC disclosure with resources’ indicators can be very useful for both internal management and external disclosure, being also able to identify the priorities of a university and their research interests.

Both the Danish guidelines and the MERITUM project consider the creation of a system of indicators the last section of an IC Report. Up to here, the methodological differences between public and private sectors are not very evident. A list of indicators designed exclusively for universities and research centres is presented in next table.

The indicators are useful to provide comparison in two ways:

- Comparison among institutions, through comparing different organisations in a given period of time. In this sense, the OEU project has done a great effort by making fifteen universities from eight different European countries working together.
- Comparison along time, through comparing two different periods of time. As a result of this comparison, the community will be able to see an evolution in the performance, objectives and fulfilled goals of an institutions. However, as happened in other kind of organisations, universities might suffer changes over time, either leading by the contextual pressures or by their own evolution. So that, the report should be flexible enough to introduce new indicators or to remove those less representative.

As mentioned before, the system of indicators is not self-explanatory since each indicator can denote or imply different things depending on the person who receive the information. Consequently, we consider crucial to take into account the literature of the first two sections to fully understand each indicator and to avoid a set of meaningless indicators.

The system of indicators of our proposal of ICU Report is organised following the general taxonomy of IC in three subcategories: Human, Organisational and Relational Capital. Within each of these subcategories, indicators are organised under different headings. These headings or transversal issues correspond to the strategic objectives that the university may have.

Hereafter, the proposal of a template for the ICU Report is presented. It comprises the three parts exposed above, with the key questions to be answered in each part. The indicators are marked by an F or a NF depending if they are financial or non-financial indicators. We present a selection of indicators taken from the OEU Strategic Matrix, which was conceived for management. Therefore, all the indicators shown in this selection were initially devised as a management tool and should be a particularly useful tool for university governance.
Table I. Systems of Indicators of ICU Report

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The reason why the system of indicators is organised by strategic objectives responds to a very important aim: to link the measurement of IC with the vision of the institution. Not everything is worth to be measured. In this sense, the Austrian Research Center (ARC) proposes an IC Report with the same focus. In its 2002 Report (the last available in English), ARC organises it around five “knowledge goals”: Knowledge Transfer, Interdisciplinarity, Research Management, Internationality and Spin-offs & Investments. This decision of linking the system of indicators with some strategic objectives was made to emphasise that the three parts are interrelated. The indicators show what resources are prioritised and subsequently what activities are launched. The activities and resources show what the main strategic interests are and how the institution wants to be in the future. The vision of the institution communicates and re-orientates what the organisation is and wants to be.
4.2. Selection of Indicators

As mentioned before, all the indicators shown in this selection were firstly devised as a management tool and are supposed to have a real usefulness as a tool for universities’ governance. This list of indicators was basically selected regarding the accumulated experience of data gathering that we developed along the OEU project. From the 141 indicators that the OEU Matrix had, only 43 were pre-selected.

The pre-selection of indicators was developed in three phases:

- **Phase 1. Selection of Strategic Objectives**

First of all, we selected a list of strategic objectives that any university may have. Our concern was to provide a shorter list of indicators that would cover all the objectives selected. With this aim, and regarding the previous definitions, we have selected a list of strategic objectives that would be, in our view, interesting enough to make a university organise and systematize all the IC data (some of them already available) in a single and homogenised document. These strategic objectives, - organised taking into account the main taxonomy of IC described in Section 2-, may represent the main concerns of universities and their communities. They are:

**Human Capital:**

- **Efficiency**

It is worth to mention that the OEU project does not consider efficiency indicators in its Strategic Matrix. However, as we saw before, many indicators may have different uses since they are able to provide information of different categories. Efficiency indicators are obviously interesting for the community and stakeholders, who want to ensure that their contributions in funding and resources are well invested.

- **Openness**

Universities are requested to be opener to the external world, regarding the new requirements of the knowledge-based society and the “Third Mission” approaches, and this mentality appears to begin from the academics of a university. The openness or open mentality of the institution, and especially of its academics, seems to be a crucial factor to avoid the traditional isolation of these institutions concerning the society as a whole.

**Organisational Capital:**

- **Autonomy**

Autonomy has been one of the main concerns of universities during the last decades, and it is not easy to identify what the autonomy of a university is. The indicators here presented only focus on financial autonomy, and, although we consider them an important first step, they are not able to capture the whole complexity of the autonomy issue in universities. Mora stated that “despite formal statement on autonomy, most universities in continental Europe have a very limited autonomy” (Mora, 2001, p.103). The issue of autonomy should be addressed from a non-quantitative approach in order to differentiate the formal autonomy from the real autonomy that different management levels many have. For this reason, the Governance chapter will deal with this issue from a deeper approach.
- **Codification of Knowledge through publications and intellectual property**

There is no room for doubt about the importance of the codification of knowledge for universities. Indeed, one of the most important groups of university outputs is the academic outcomes, that is, the publications. For this reason, the productivity of universities in this regard and their quality is a basic issue to address in order to better manage resources and activities.

Apart from the academic outcomes, Intellectual Property is the other main output of a university. It includes patents and licensees and represents the ability of universities to commercialise their research.

- **Strategic Decisions**

Though assuming that most of the information about strategic decisions will be confidential, this issue must be undertaken in order to allow the community to assess how the management is done in general terms. Therefore, very few indicators are taken into account in this heading in comparison with the amount of internal indicators.

- **Relational Capital:**
  - **Spin-offs**

The spin-offs are defined as companies that commercialize the result of university research. This research can be exploited by the university academics, by their own or together with companies. These spin-offs focus on the development of a strongly innovative business.

Therefore, the number of spin-offs that are born in a university shows somehow the capacity to commercialize research, together with Intellectual Property.

- **Contracts and R&D projects**

The contracts and R&D projects are other way of universities to interact with two main external actors: government and industry. This strategic objective does not take into account the interaction of the university with society as a whole, which will be included through the last three objectives within Relational Capital: participation into policy making, involvement into social and cultural life and public understanding of Science.

- **Knowledge Transfer through Technology Transfer Institutions**

Technology transfer institutions (TTIs) are defined as “institutions which provide, continuously and systematically, services to publicly funded or co-funded research organisations in order to commercialise their research results and capacities. They are instruments to further the dissemination and the uptake of new technologies by enterprises. TTIs are organizations or parts of organizations which help the staff at public research organizations (PROs) to identify and manage intellectual assets. This includes the protection of intellectual property and the transfer of such rights by way of licensing to other parties. In addition to IPR management, TTIs can also help PROs to create or support new firms (for example technology parks and incubators) or to carry out collaborative research” (European Commission, 2004, p.10).
At an operational level, an organisation is defined as a technology transfer institution, if it:

a) provides services connected to the development and transfer of technology, rather than other (scientific) knowledge; and
b) provides one, several or all of the following types of services:
   - Patenting and IP management, including activities that are necessary for the filing of the patent, such as invention disclosure and evaluation, as well as management of other forms of IP, such as copyright, software, databases etc.;
   - Licensing of intellectual property rights;
   - Liaison for collaborative and contract research including client recruitment, contracting, legal issues, or contract management;
   - Support of spin-offs including services such as business planning, setting up, raising funds, etc.;
   - Financing of spin-offs by providing seed capital or by holding shares; and
c) is connected to one or several PROs.

The technology transfer institutions are gaining importance day by day as intermediaries between the university and the external world. Currently, the “Third Mission” approaches clearly benefit the inclusion of this issue, as well as the following objectives.

- **Knowledge Transfer through Human Resources**

   The transfer of knowledge from universities to society is probably the most traditional method of interaction between them. Despite this issue is not new at all, it still maintains a very high importance.

- **Participation into Policy Making**

   This objective tries to capture the academics’ influence in decision making, which is another way for a university to interact with its environment.

- **Involvement into Social and Cultural life**

   The new approaches from the Third Mission of universities have raised the interaction between of universities with society to a primordial objective. Therefore, a significant involvement of a university into the social and

- **Public Understanding of Science**

   From this Third Mission approach mentioned above, universities should be active in spreading knowledge throughout society. This heading deals with measuring the benefits that universities provide to public in general, instead of focusing in a reduced and specialised public, which is the norm.

   Regarding these four last categories (Knowledge Transfer through Human Resources, Participation into Policy Making, Involvement into Social and Cultural life and Public Understanding of Science), indicators are very new and difficult to collect, since there is not previous experience in the topic. As the reader may note, indicators are less demanding regarding information gathering and they focus on identifying the existence of related activities and checking what kind of activities and events are done in a university.

   After defining the measurement goals that a university may have, we grouped the indicators into these categories, in order to ensure a minimum number of indicators within each category. In next stages, a first pre-selection and subsequent cutting has been done.
Phase 2. Selection of Indicators Regarding Availability of Data and Perceived Willingness to Disclose

Within each strategic heading, we selected a number of indicators. For this selection, we took into account as a main criterion the availability of data at the UAM and the available information of other universities within the OEU group. Unfortunately, the information about other universities is still very scarce, and we had to base our selection mainly on the UAM availability. Subsequently, we tried to select the indicators that were more easily collected.

Phase 3. First Checking against MERITUM Characteristics

The definitive list of indicators actually published by universities should all be part of the internal document developed for management and decision making. If an indicator is not useful for internal management, its disclosure may make no sense. The more useful the indicator is internally, the better it will be for the community.

The third phase in the selection of indicators for disclosure was a first checking against the MERITUM characteristics of indicators. In 2002, the MERITUM project carried out a panel analysis to point out the most important and valuable characteristic that an indicator should have. The result was the following list of characteristics (MERITUM, 2002):

- **Useful**: an indicator is useful if it facilitates decision making both to internal and external users.
- **Relevant**: they are relevant when providing information that can modify or reassure the expectations of decision makers. To allow this, they should be:
  - Significant: related to issues critical for universities.
  - Understandable: presented in a way they are easily understood by potential users.
  - Timely: available when required for analysis, comparison or decision making purposes.
- **Comparable**: presented following general accepted criteria, so that users may make comparisons over time and across institutions, and
- **Reliable**: trustworthy. This requires the indicators to be:
  - Objective: the value is not affected by any bias arising from the interests of the parties involved in the preparation of the information.
  - Truthful: the information reflects the real situation.
  - Verifiable: it is possible to assess the credibility of the information it provides.
- **Feasible**: the information for their elaboration can be obtained from the University’s information system, or the cost of modifying those systems to obtain the required information should be lower than the benefits (private or social) arising from the use of the indicator.

However, and even though we have considered these characteristics in order to pre-select this battery of indicators, university managers should do the same exercise in order to assess each indicator taking into account their own management purposes and objectives.

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6 Regarding the verifiability of the indicators, the Community of Madrid is currently implementing a new system for the distribution of governmental funds based on Intellectual Capital issues. As the lump sum of funds is set in advance, the increase in the share of one university unavoidably means a decrease in the share of other one. In this situation, the verifiability of the data is going to be a main concern in the process of selecting the indicators, in order to avoid misappropriations.
4.3. **Scope of the ICR**

According to RICARDIS, standardization on the measurement of intangibles is at the same time an important and delicate issue. The document explains how standardization is paramount to provide comparability, interpretability and credibility of information. On the other hand, such standardization is difficult since IC Reports are designed around the specific characteristics of each organisation. The European Commission (2006) proposes three levels of indicators, as shown in the following graph:

![Figure I. Levels of standardization of IC indicators.](image)

Regarding the RICARDIS proposal for standardization, we should consider the basic or general set of indicators as those that should be useful for all organisations and institutions. Using the same thinking, there would be a set of sector-specific indicators (only useful for those in a specific sector, universities and research institutions in this case). Institution-specific indicators can be chosen by each university allowing for individual considerations.

Apart from the effort that the European Union is making for the standardization at the first level (the basic set of indicators), we attempt to set standards for clearly identifying, defining and describing indicators at the second level (sector-specific indicators for universities). The third level indicators should be developed by each institution individually. Assuming that every organisation is idiosyncratic in nature, the creation of an opener framework (with some homogenised categories to ensure consistency and comparison) can allow new and attractive possibilities. The model that RICARDIS proposes is narrow enough to assure a certain degree of comparison, and open enough to allow institutions to include their main concerns.

4.4. **Breaking Down by Scientific Fields**

The great differences among scientific fields concerning expected outputs (mainly patents and publications) make crucial to avoid aggregate comparisons regarding productivity. Although there is a clear need of providing disaggregated data for certain indicators, there is not consensus about the number of scientific fields that the OEU group should use for the breaking down of indicators. It is our aim show a first approach to adapt the diversity of the European Universities and categorise the great number of disciplines into six big scientific fields, following the recommendations of the Frascati Manual (OECD, 2002).
With this aim, we undertook a comparison among nine European universities\(^7\) in order to unravel their heterogeneity concerning scientific fields and the availability of disaggregated information. By doing this, we had to assume the number of faculties as the minimum unit of analysis possible. In principle, the breaking down of information by department, lab or research group would be highly costly (if possible). For example, this information is not available in the UAM. For this reason, we have decided to make a medium disintegration by faculties for this first comparison. However, we consider that a deeper disintegration of information may be very interesting for managing Intellectual Capital internally, and it could be thought about in the future.

In this regard, we have used the classification of fields provided by the Frascati Manual that is showed below:

<table>
<thead>
<tr>
<th>Table II. Fields of Science and Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. NATURAL SCIENCES</strong></td>
</tr>
<tr>
<td>1.1. Mathematics and computer sciences</td>
</tr>
<tr>
<td>[mathematics and other allied fields:</td>
</tr>
<tr>
<td>computer sciences and other allied</td>
</tr>
<tr>
<td>subjects (software development only;</td>
</tr>
<tr>
<td>hardware development should be</td>
</tr>
<tr>
<td>classified in the engineering fields)]</td>
</tr>
<tr>
<td>1.2. Physical sciences (astronomy and</td>
</tr>
<tr>
<td>space sciences, physics, other</td>
</tr>
<tr>
<td>allied subjects)</td>
</tr>
<tr>
<td>1.3. Chemical sciences (chemistry, other</td>
</tr>
<tr>
<td>allied subjects)</td>
</tr>
<tr>
<td>1.4. Earth and related environmental</td>
</tr>
<tr>
<td>sciences (geology, geophysics,</td>
</tr>
<tr>
<td>mineralogy, physical geography and</td>
</tr>
<tr>
<td>other geosciences, meteorology and other</td>
</tr>
<tr>
<td>atmospheric sciences including climatic</td>
</tr>
<tr>
<td>research, oceanography, vulcanology,</td>
</tr>
<tr>
<td>palaeoecology, other allied sciences)</td>
</tr>
<tr>
<td>1.5. Biological sciences (biology, botany,</td>
</tr>
<tr>
<td>bacteriology, microbiology, zoology,</td>
</tr>
<tr>
<td>entomology, genetics, biochemistry,</td>
</tr>
<tr>
<td>biophysics, other allied sciences,</td>
</tr>
<tr>
<td>excluding clinical and veterinary sciences)</td>
</tr>
<tr>
<td><strong>2. ENGINEERING AND TECHNOLOGY</strong></td>
</tr>
<tr>
<td>2.1. Civil engineering (architecture</td>
</tr>
<tr>
<td>engineering, building science and</td>
</tr>
<tr>
<td>engineering, municipal and structural</td>
</tr>
<tr>
<td>engineering and other allied subjects)</td>
</tr>
<tr>
<td>2.1. Electrical engineering, electronics</td>
</tr>
<tr>
<td>[electrical engineering, electronics,</td>
</tr>
<tr>
<td>communication engineering and systems,</td>
</tr>
<tr>
<td>computer engineering (hardware only) and</td>
</tr>
<tr>
<td>other allied subjects]</td>
</tr>
<tr>
<td>2.3. Other engineering sciences (such as</td>
</tr>
<tr>
<td>chemical, aeronautical and space,</td>
</tr>
<tr>
<td>mechanical, metallurgical and materials</td>
</tr>
<tr>
<td>engineering, and their specialised</td>
</tr>
<tr>
<td>subdivisions; forest products; applied</td>
</tr>
<tr>
<td>sciences such as geodesy, industrial</td>
</tr>
<tr>
<td>chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other allied subjects)</td>
</tr>
<tr>
<td><strong>3. MEDICAL SCIENCES</strong></td>
</tr>
<tr>
<td>3.1. Basic medicine (anatomy, cytology,</td>
</tr>
<tr>
<td>physiology, genetics, pharmacy,</td>
</tr>
<tr>
<td>pharmacology, toxicology, immunology</td>
</tr>
<tr>
<td>and immunohaematology, clinical chemistry,</td>
</tr>
<tr>
<td>clinical microbiology, pathology)</td>
</tr>
<tr>
<td>3.2. Clinical medicine (anaesthesiology,</td>
</tr>
<tr>
<td>paediatrics, obstetrics and gynaecology,</td>
</tr>
<tr>
<td>internal medicine, surgery, dentistry,</td>
</tr>
<tr>
<td>neurology, psychiatry, radiology,</td>
</tr>
<tr>
<td>therapeutics, otorhinolaryngology,</td>
</tr>
<tr>
<td>ophthalmology)</td>
</tr>
<tr>
<td>3.3. Health sciences (public health</td>
</tr>
<tr>
<td>services, social medicine, hygiene,</td>
</tr>
<tr>
<td>nursing, epidemiology)</td>
</tr>
<tr>
<td><strong>4. AGRICULTURAL SCIENCES</strong></td>
</tr>
<tr>
<td>4.1. Agriculture, forestry, fisheries and</td>
</tr>
<tr>
<td>allied sciences (agronomy, animal</td>
</tr>
<tr>
<td>husbandry, fisheries, forestry, horticulture, other allied subjects)</td>
</tr>
<tr>
<td>4.2. Veterinary medicine</td>
</tr>
<tr>
<td><strong>5. SOCIAL SCIENCES</strong></td>
</tr>
<tr>
<td>5.1. Psychology</td>
</tr>
<tr>
<td>5.2. Economics</td>
</tr>
<tr>
<td>5.3. Educational sciences (education and</td>
</tr>
<tr>
<td>training and other allied subjects)</td>
</tr>
<tr>
<td>5.4. Other social sciences [anthropology,</td>
</tr>
<tr>
<td>social and cultural] and ethnology,</td>
</tr>
<tr>
<td>demography, geography (human, economic</td>
</tr>
<tr>
<td>and social), town and country planning,</td>
</tr>
<tr>
<td>management, law, linguistics, political</td>
</tr>
<tr>
<td>sciences, sociology, organisation and</td>
</tr>
<tr>
<td>methods, miscellaneous social sciences</td>
</tr>
<tr>
<td>and interdisciplinary, methodological and</td>
</tr>
<tr>
<td>and historical S&amp;T activities relating to</td>
</tr>
<tr>
<td>subjects in this group. Physical</td>
</tr>
<tr>
<td>anthropology, physical geography and</td>
</tr>
<tr>
<td>psychophysiology should normally be</td>
</tr>
<tr>
<td>classified with the natural sciences]</td>
</tr>
</tbody>
</table>

\(^7\) Part of the OEU project from France, Switzerland, Spain, Italy, Portugal and Netherlands.
6. HUMANITIES

6.1. History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)
6.2. Languages and literature (ancient and modern)
6.3. Other humanities (philosophy (including the history of science and technology), arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic “research” of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S&T activities relating to the subjects in this group)


Therefore, we considered six big scientific fields in order to group the great variety of existing disciplines\(^8\). In this exercise, we undertook a first comparison with nine universities in the European Union. We obviously assume that the number of universities considered is much reduced, but it may be interesting as a first approach. The goal here was to group the areas which a university is involved, considering the faculties (as the minimum statistical feasible unit of study). This approximation by faculties is considered as a proxy to the areas in which a university researches.

Then, the comparison was not considered very difficult in a first instance. Nevertheless, it is easy to be confused if someone does not do in depth through the breaking down of the Frascati fields presented in the previous page. Titles of each scientific field are not enough to assure the right inclusion in one or other field.

<table>
<thead>
<tr>
<th>Field</th>
<th>UMLV Université de Marne-la-Vallée</th>
<th>UNIL Université de Lausanne</th>
<th>Universidad Autónoma de Madrid</th>
<th>Université d’Aveiro</th>
<th>Université Paris-Sud</th>
<th>University of Maastricht</th>
<th>University of Bologne</th>
<th>EPFL Ecole Polytechnique Fédérale de Lausanne</th>
<th>University of Venice Ca’ Foscari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Sciences</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Engineering and technology</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Medical sciences</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Agricultural sciences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Social sciences</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Humanities</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Source: Gathered from the information presented at Budapest meeting (December 2005). OEU Project.

Another issue to be addressed in relation to scientific fields is the nomination of a university as generalist or specialised. We define a university as specialised when a big proportion of its effort is concentrated in an area or few related areas. We define it as generalist if a university spreads its effort in a number of different areas of knowledge.

At a first glance, only two of the nine universities of the table seem to clearly be specialised: UMLV Université de Marne-la-Vallée and EPFL Ecole Polytechnique Fédérale de Lausanne. Both of them are only engaged with Natural Sciences and Engineering and Technology. On the other extreme, we could identify three generalised universities: University of Bologne, Autonomous University of Madrid and University of Aveiro. Still, in this little sample, there are

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\(^8\) It is important to note that the Spanish Government does not separate the field of Agricultural Sciences (having only five fields) and this can pose a problem when universities have to decide how to report its information. A homogenisation of the way of grouping information is therefore highly needed.
three universities that remain in the middle between being specialised or generalised. In order to classify them, a clear definition of limits should be set down.

It has been difficult to set the limit between a generalist university and a specialised one. The OEU project undertook this goal but no unique solution has been raised. In order to show the complexity of this issue, we suggest some proposals for this separation with its correspondent problems and limitations:

(a) Breaking by number of areas of knowledge

We could consider specialised universities as those that are present in, for example, three or less scientific fields. This is, in our view, a naive approach, since being present in a specific area does not mean to be active from a research point of view. Moreover, some areas can remain only as historical objective and be of no interest for developing. For example, a university could have lost all the good researchers in an area and still maintain the same research institute, even if it is not prolific.

(b) Breaking by the resources dedicated to some areas

We can also consider the specialisation of a university dependent of the amount of resources that the university authorities dedicate to each area. This approach can result in misleading conclusions for many reasons. One of them could be that the university authorities do not have the power of reallocating resources in a given period of time. For example, in Spain, personnel cannot be reallocated, and this is the most important research-related expense that universities do. Also, some scientific fields usually need more fixed investment, such as labs, equipment, etc.

(c) Breaking by the outputs of areas

Other option may be to discriminate the most important fields regarding the most productive ones, that is, the ones that produce more outputs. One of the problems of this approach is that there is not enough knowledge about the outputs of a university (excepting publications and Intellectual property, which usually benefit the Sciences areas9). Other problem is related with new areas of knowledge, which may not give results in a short period of time, but can be a source of excellence in the future.

(d) Breaking down by the priority lines of a university

This is, in our opinion, the most coherent breaking down of specialization. As the university decides how many areas it invests in, it indirectly says what the strategy of the university is: looking for few areas of excellence or spreading its effort in a number of different areas of knowledge.

Although this breaking down can seem logical in theory, it also poses a number of limitations. First, there are universities that do not have priority lines (as the UAM). Second, the mere number of priority lines is not enough to assess the specialization of a university. It would be necessary to go in depth to know which area each specific priority is in, which would require information on a much disintegrated level.

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9 Measuring the quality of publications through the ISI database, or any worldwide criterion, seems to benefit general discoveries and hinder applied discoveries. This obviously benefits Sciences fields, since the discoveries made in these areas are easily proved and applied everywhere. On the other hand, very important discoveries in other areas, as Social Sciences, may be applied only in the research place.
4.5. Practical Issues on ICU Reporting

In this sub-section, we undertake three main concerns regarding IC Reporting on Universities: how to collect the data needed, who should be responsible of this data gathering, and how frequent the Report should be.

4.5.1. Data Gathering: How?

The data gathering process could vary from one institution to another, depending on the development of their internal databases. It is important to highlight that the information on IC should be collected in a systematic way, to ensure consistency in data. The main sources of information could be the following (MERITUM, 2002, p. 84):

- The institution’s databases. In this regard, the UAM is doing an important effort in order to implement a data warehouse comprising the variety of different databases, in order to improve its efficiency.
- Internal documents and reviews. As we mentioned before, much of the information requested here has been collected for a long time. However, it is spread in many different documents.
- Questionnaires. They can be used to adapt an ICU Report to the idiosyncrasy of a university and to identify clashing positions and potential problematic groups.
- Interviews. It is now clear that there is an important part of qualitative information in an ICU Report. Therefore, it may be necessary to carry out a survey among different levels at a university to capture it.
- External sources. It is important to take into account the perception that external actors have about a university, and to identify external opportunities and barriers.

When presenting the system of indicators, both internally and externally, it appears to be significant to show data as an average of the last 3 years. In this way, one year averaged with the last two will be compared to the previous year also averaged with its last two. Consequently, these data can better show general trends and avoid temporal behaviours and situations. We consider that both methods (the direct and the averaged comparison) provide complementary information.

4.5.2. Data Gathering: Who?

Referring to companies, MERITUM guidelines highlight that it is necessary to distinguish between the individuals in charge of the development and design of the measurement system as such, and those engaged in the actual development of the indicators. With regard to data gathering, information must be obtained from the different departments of the institution, since the data needed is of a diverse nature. Concerning universities, the ideal situation would be a central data gathering office that contacts different departments. The individuals in charge of the development of the measure systems may be embedded in Office for the preparation of the Strategic Plan, since we consider these documents very related.

Regardless of who is responsible for the preparation of the ICU Report, the academic top authorities should be committed to and engaged in the preparation of the Intellectual Capital Report of the institution.
4.5.3. Frequency of Reporting

In the private sector, international practices have set up the frequency of reporting in at least once per year. Nonetheless, the tendency is to shorten the reporting period as a result of the demands of interested third parties. For universities, we suggest that the preparation of the ICU Report should have the same frequency as the publication of the Strategic Plan, since these documents are complementary. Therefore, the complete ICU Report can be published every two/three years, and follow-ups of it annually.

MERITUM states that it is advisable to carry out a cost-benefit analysis to establish the frequency with which periodic information should be prepared, both for internal and external use (MERITUM, 2002, p.85).

4.6. Methodological Shortcomings

As referred before, in our view the practical approach taken in this document has one particular limitation, which will be tackled in future work: the lack of activity-related indicators. As we formally defined above, activities are actions aimed to improve the situation of the IC in an institution. They reflect how an institution is going to be rather than how it is at the moment. They really show what the main strategic goals of the institution are. The RICARDIS document also emphasises the importance of distinguishing between resources and activities.

Despite the fact that the lack of activities-related indicators clearly represents a limitation to this work, there was a crucial reason for this. The OEU project has been mainly working on resources, and it has not proposed indicators on activities. Within the project, indicators were selected according to the ease of data collection: indeed, the feasibility of obtaining information in Universities was a major criterion when selecting indicators.

This limitation is also closely related with the goal of this work: creating a list of indicators that looks for the comparability among institutions. If we consider comparability as a first aim to fulfil, it may advisable to use indicators of resources. Moreover, we selected resource indicators bearing in mind the possible reluctance to publish strategic moves. In our view, how a university is planning to improve a certain situation throws invaluable light on the strategic decisions that have been made internally. On the one hand, this will be of great value to attract, for example, the best researchers or students, but, on the other, may give out sensitive information. A careful selection of the indicators on activities to be disclosed is therefore needed.

Nonetheless, we state that the scanning of indicators that provide information on activities will be paramount in future steps in ICU Report development. Subsequently, this work should be considered an initial step that will be developed in the future.

A second shortcoming of this proposal is that some indicators were not clear enough. In order to make indicators comparable among institutions, a very precise and clear definition would be essential. Even with a very clear definition, there can be misleading indicators depending on the person or institution that gathers them. We consider that this limitation should be understood as a structural characteristic of a novel science, which will become more precise over time by the process of standards setting. For example, the indicator number 9 (see table I: Amount of research budget managed at the central level / Research Budget) seems easy to calculate in theory, but is extremely difficult in practice, for these reasons:
a) The classification of items in the budget does not attend the criterion of autonomy in the use of funds, so this indicator would be impossible to be calculated for someone external to the university and subsequently does not fulfil the requirement of verifiability.

b) There are items that have a part that is managed at the central level and other part that is not. It is paramount to know the proportion of each part. This is the case, for example, of some money coming from the regional government.

c) The situation could change over time, so the criteria used in a given period of time could not be useful for the next one.

d) Even if we can solve all the problems mentioned above, some limitations about definitions may still remain. For example, are the expenses in libraries part of the budget managed at central level? In whole or in part? There is a number of acquisitions that are financed by research projects and they are subsequently not of free use by the university authorities. It would be the same case for new infrastructures.

e) The overheads taken from the research projects and contracts (15-20%) are considered part of the external funding. This amount is not clearly identified, but it is in fact part of the budget managed at central level since it is of free use by the university authorities.

Therefore, only a member of the university with access to internal accounting could calculate this indicator. In general, the top authorities should be aware of the importance of these indicators and dedicate enough resources to calculate them appropriately. Each indicator would have specific problems and we may be able to identify only a part of them. In some cases, we could observe that the data is available, but manual procedures would be required to gather information useful for management.

Other methodological shortcoming can be the different levels of development of universities in the definitions of strategic goals. This difference can hinder a comparison among universities. As argued when analysing Intellectual Capital models at firm level, the starting point to implement a research measurement system, is the discussion and definition of corporate goals and strategies, because “the process of acquiring, applying and exploiting knowledge starts with the definition of specific goals” (Leitner & Warden, 2004; p.8). Accordingly, the culture of quality and transparency in the higher education system started some years ago has pressed universities around the world to define a Mission Statement or a Strategic Plan. Even so, not all universities are at the same stage of development.

Besides, most of the European universities follow a functional and disciplinary internal structure, which make it difficult to manage university research activity as a whole. Indeed, most managers of individual faculties have little knowledge about research activity in other disciplines. Moreover, this organisational structure is not flexible enough to assess and measure multidisciplinary actions and joint research (Sanchez and Elena, 2006).

5. Observatory of European Universities experience: the Autonomous University of Madrid Case Study

The successful embodiment of new management systems in universities can be neither understood nor implemented without an in depth analysis of the current governance of the university, specifically their qualities, potentialities, barriers and limitations. In this sense, this model has been tested against a survey carried out among fourteen decision makers at the Autonomous University of Madrid (UAM), at different level.
This case study was undertaken to complement and give sense to the proposed framework of IC approaches in universities presented the previous section. We defend that the idiosyncrasy of a university affects the successful implementation of an IC model. Therefore, it is paramount to carry an in-depth study of each university that decides to implement these systems.

Despite, the UAM has shown several necessities that may be solved by implementing an IC system, some barriers that could hinder or even make this implementation impossible if they are not taken into account and appropriately managed can be identified.

It is important to mention that, the UAM has been one of the most proactive universities within the Observatory of European Universities project\textsuperscript{10}.

In order to understand the European university system, to contribute actively towards excellence and to improve university management processes in this changing context, the Observatory is one of the most ambitious initiatives. It is being developed within the PRIME\textsuperscript{11} Network of Excellence, and supported by the VI Framework Programme.

The main aim of the Observatory is to understand better the importance of managing intangibles in public universities in order to improve their level of quality and competitiveness regarding research activity. Fifteen universities and research institutes from eight different European countries\textsuperscript{12} are working together to develop a common framework of analysis and to build a battery of indicators to measure and compare the intangible elements related to research activities. That analytical framework is a bi-dimensional matrix, the so-called Strategic Matrix, organised through five thematic dimensions (funding, human resources, academic output, third mission, and governance) and five transversal issues (autonomy, strategic capabilities, attractiveness, differentiation profile, and territorial embedding). Each cell of the Matrix contains various key questions and a set of indicators. Hence, this analytical framework helps to conceptualised research activities in public universities, and to manage them (OEU, 2006).

After creating this Strategic Matrix, and now that the project is bound to finish, the OEU group is working on a methodological guide that will fulfil the following objectives:

- To provide a tool for the application of the thematic dimensions of the Strategic Matrix within non-participant universities, in order to manage IC. In this methodological guide, all the problems in data gathering and methodological recommendations will be addressed, in order to help universities facing similar concerns.

- To recommend guidelines for the disclosure of IC information. Next section is focuses on the proposal of general guidelines for helping HE institutions when reporting IC information.

Although, when of applying the OEU principles and filling up the Matrix within the UAM we are learning about different issues, like the data gathering process or the utility of the OEU framework for internal management, this paper is mainly focused on the aspects related to the diffusion of IC indicators. Our aim is to move towards the individual problems perceived in our case study to a more general approach useful for other European universities.

\textsuperscript{10} June 2004 - December 2006

\textsuperscript{11} PRIME stands for Policies for Research and Innovation in the Move towards the European Research Area

\textsuperscript{12} Germany, Spain, France, the Netherlands, Hungary, Italy, Portugal and Switzerland.
In the attempt to analyse the UAM case, during June and July 2006, fourteen in-depth interviews to have been done among the main decision makers at the UAM and other positions that are considered strategically important due to the amount of information that they receive and their decision capacity. In particular: Rector, Vice-Rector for Research, Vice-Rector for Libraries and Scientific Promotion, Director of Research Institute, Director of Research Institute, Dean of Economics and Business Faculty, Social Council President, Professor of Archaeology and Professor of Accounting and Finance, Management Director, Head of the Research Administrative office, Head of the Personnel Services, University Personnel Claiming Office, and Deputy Director of Research in Universities from the Madrid Regional Government.

The whole survey comprised two big parts: the first one dealt with the analysis of the usefulness and willingness to disclose the indicators proposed in the ICU Report, and the second one dealt with analysing the governance and the idiosyncrasy in research in the UAM. Whereas both parts are equally relevant for our analysis, the results here presented mainly correspond to the information gathered regarding the disclosure of indicators. In future papers, the analysis of governance will be exposed.

Accordingly, the goals of the study mainly fall into three categories:

a) Evaluating the usefulness for management of a pile of selected indicators. For that, the interviewees had to evaluate each indicator regarding a Likert scale.

It is interesting to state that, despite interviewees were asked to reply the questionnaire in a general way, it was perceived that they usually focus on the UAM case. Therefore, the perceived usefulness of the indicators is much related to the specificities of the UAM.

In this sense, the perceived usefulness of the indicators has been so high that no indicator has been rejected at this stage. This exercise has been very positive in general since it clearly shows the perceived importance of this kind of information: interviewees appear to be aware that IC information is becoming more and more needed everyday.

b) Identifying “styles of governance”. This exercise is part of the thematic dimension of the Observatory “Governance”.

Defining the governance of a university is not an easy task since these institutions are complex and possess a number of specific characteristics that make them unique (Sporn, 1999). However, the pressure of the social environment is forcing an analysis of their governance styles in order to better understand their functioning and to raise recommendations that allows them to adapt to the new social demands.

Our analysis has been based on the most relevant characteristics regarding research of the governance style of the UAM, focusing on the organisational structure, the levels of centralisation/decentralisation in research management, the mechanisms for conflicts solution, the internal and external perception, the capacity of adaptation and the degree of autonomy and the relationship with society. As mentioned before, given the ambitious objectives of the survey, the outcomes from the governance analysis will be presented in forthcoming works.

c) Assessing possible barriers for the disclosure of indicators, with the goal of a future creation of an Intellectual Capital Report for HE institutions.

Concerning perceived barriers on the diffusion of the list of indicators, no respondents identified any indicator as confidential. That is, the whole sample considered all the indicators as potentially disclosed. It was not surprising to find that all indicators did not
pose confidentiality problems, since the pre-selection was done based partially on the previous experience in the OEU data gathering process at the UAM.

The total acceptance of all the indicators for disclosure raises an interesting and very positive conclusion. The general willingness to disclose IC information show that the interviewees are aware of the necessity of transparency required by the European Union, and they do not support anymore the traditional opacity of universities regarding funding distribution. Moreover, they are showing interest in the university to engage with measurable objectives and subsequently they are supporting a compromise to society. In other words, agreeing on the disclosure of a list of indicators means that the university is willing to accept compromises of transparency and accounting, which a very positive signal.

When undertaking this work, some methodological considerations have emerged. The first one is that, due to the nature of the survey, these interviews should be regarded as opinions rather than statistics. Besides, the variety and heterogeneity of the opinions would make quantitative information meaningless. The second one is that the selection of the sample has not been random, and therefore it does not have statistical validity within the UAM. However, it has provided very rich information regarding opinions and has shown the heterogeneity of positions at the University.

Last but not least, it is worth mentioning that since the survey template has been based on the work done within the OEU project its scope is quite generalist, aiming at capturing the reality of European universities and research centres. Although this kind of scope can obviously offer a global idea of the university situation, we consider that a more specific interview template could have better reflected the idiosyncrasy of the institution. Obviously, this specific design implies a previous knowledge of the situation in each university. In the case of the UAM, in some cases it has been observed that the close or Likert-scaled questions turned out to be incongruous with the speech of the interviewee. Also, considerations about the research groups (as virtual labs), which were not in the survey, should be included. Because of everything mentioned above, if the exercise were to be repeated in some months, a better and more specific interview template could be created.

6. Conclusions and Ways Forward

As we have seen, this work aims three main objectives. The first has been to identify the necessity of new governing models and managerial tools in universities, reflecting specifically on the benefits of applying IC approaches. The second aim has been to provide an initial framework for disclosure IC information within universities: ICU Report for disclosure. In this sense, we provide recommendations about the structure and scope of the report, the selection of indicators, practical issues related to the data gathering process and the frequency of the report, and, finally, some methodological shortcomings. The last aim has been to assess the usefulness and suitability of this ICU framework in the specific case of the Autonomous University of Madrid.

At the centre of this work has been the concept of IC, defined as the combination of an organisation’s Human, Relational and Organisational resources and activities (European Commission, 2006).

As argued, there are two main reasons supporting the need of managing and reporting IC in universities. On the one hand, because universities’ main inputs and outputs are basically intangibles, only a small part of these are identified and very limited instruments exist to
measure and manage them (Cañibano y Sánchez, 2004). On the other hand, because of the new pressures for accountability within public institutions, universities and research centers are forced to be more transparent and to disseminate more information to stakeholders (European Commission, 2003).

In this new changing context, this work has evidenced that new methods of measurement and management are necessary within universities and research centres, and IC approaches seem to be a potential answer to cope with the new challenges.

The ICU Report is a proposal to the disclosure of IC information. This tool deals with a first attempt to create a homogenised IC Report specifically designed for universities and research centres. With this purpose, we have designed the ICU Report with three main sections, in order to address the close relationship of management with the selection of information for disclosure. In this regard, a pile of indicators were selected.

The system of indicators proposed has taken into account the close relation between management and measurement. Thus, any system of indicators is designed to be useful for management, and it should be reflection on how and in what extent management will use this system. It has been, in our view, a valuable attempt to create a framework in order to make universities become aware of the importance of IC their institutions. Nevertheless, as mentioned above, it is important to keep in mind that universities will have to make an individual effort in adapting this framework to their specific characteristics.

We consider that the list of indicators is not self-explanatory since each indicator can denote or imply different things depending on the person who receive the information. Consequently, it is crucial to add the literature required to understand each indicator in order to avoid a set of meaningless indicators.

The lack of activities-related indicators is one perceived limitation of the ICU system of indicators for management and, subsequently, of the ICU Report for disclosure. Accordingly, this work should be considered an initial attempt that will be extended in the future: we state that the scanning of indicators that provide activities’ information will be paramount in future steps of an ICU Report development. Moreover, when running the survey, it was perceived that some indicators would need a further definition, and even with this, there can be misleading indicators depending on the person or institution that gathers them. This limitation should be understood as a structural characteristic of a novel science, which will become more precise over time by the process of standards setting.

Furthermore, it was crucial to take into account the idiosyncrasy of each institution when considering the creation of this proposal, especially how these specific characteristics can delimit its usefulness and what barriers can hinder the right implementation of an ICU model. In order to fulfil this objective, a survey has been done at the Autonomous University of Madrid. It has comprised fourteen interviews among decision makers at the UAM at different levels (such as the Rector and some vice rectors), and one responsible of universities in the government of the Community of Madrid.

Although no quantitative data has been collected (regarding the nature of the study), we can conclude that the UAM top management is very much aware of the necessity of this kind of management tools for both internal and external uses. They have been very proactive with the research group and shown a great interest within the work. The general willingness to disclose IC information shows that the interviewees are aware of the necessity of transparency required by the European Union and society at large.

In this regard, the participants state that indicators would be very useful to identify strategic objectives and priority lines. The fact that the top authorities of the UAM perceived most of
the indicators as very useful and no indicator was considered confidential highlights that there is a willingness to acquire a commitment with the community (students, public authorities funding universities, labour market and society as a whole).

Notwithstanding this willingness, there are some barriers that may hinder the implementation of new management models if they are not appropriately treated. They are related to the current power structure of the university and the resistance to change perceived in some people and services. Regarding the resistance to change, we recommend providing these groups with detailed information and a fluent communication in order to improve their understanding and motivation. Moreover, some groups have been identified that could be the motor of change if they were engaged enough, such as the research groups, which gather their own funding and act as virtual labs apart from the university government.

In order to address the characteristic complexity of universities to these proposals, we also undertook the study of the UAM’s research management and governance. By this study, it was clearly perceived the transition environment that is taking place in the UAM, and, in general, in all European universities. Most interviewees are aware of the new and challenging paradigm, although there is still a high diversity in the perceptions of the current situation.

Therefore, our final recommendation is the implementation of Intellectual Capital models in the UAM, in order maintain the levels of excellence in research and efficiently manage the opportunities and challenges of the new context.

In summary, we consider that the ICU framework is an easy instrument to characterise research activities within universities. It facilitates a learning process about what are, and will be, the key issues for universities and presses university authorities to define strategic guidelines. Although many indicators of this system have been traditionally used in universities, the contribution of this work has been to create a common working framework in an initial attempt to homogenise and harmonise Intellectual Capital information. Also, the ICU framework highlights the importance of people, knowledge and innovation in achieving strategic goals, since it recognises that universities are key producers of knowledge and innovation and that Human Capital is one of the main factors of this process.

We believe that this experience, though somehow limited (mainly due to the novelty of the issue and the relative lack of previous experiences), has created a tentative framework to develop an IC model in universities, and has made us gather a broader understanding of the university unique features in the specific case of the UAM. However, should be considered exploratory in nature. This case study allowed us to get some insight into the university routines and to adapt the ICU framework to a specific university. We consider that the elaboration of other case studies would be a logical way forward to the generalisation of results. Nevertheless, this ICU framework can be considered a good starting point in order to inspire future research.

In this sense, there are many other possible ways forward for this study. The first logical way forward of this study can be the inclusion of activities-related indicators in both the ICU system of indicators and the ICU Report. Some additional developments of this work can be the extension of the ICU model to teaching, since the work has approached only research so far.
7. References


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