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An intellectual capital maturity model (ICMM) to improve strategic management in European universities: A dynamic approach

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An intellectual capital maturity model (ICMM) to improve strategic management in European universities

A dynamic approach

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Abstract

Purpose – The public sector is one of the least addressed areas of intellectual capital (IC) research. Universities are an interesting area of investigation because they are considered critical players in the knowledge-based society. The purpose of this paper is to develop a more general, flexible and comprehensive "IC Maturity Model" for Universities (ICMM), a framework for defining and implementing IC measurement and management approaches, as part of the whole strategic management of universities. Thus, the ICMM proposes a staged framework to initiate a step-by-step change within a university based upon its current level of IC management maturity. The different steps of maturity might be an answer to cope with the huge diversity of European universities, some of which have strong managerial orientation, while others follow collegial forms of governance.

Design/methodology/approach – The research approach is based on what has been called the "third stage" of IC research (Dumay and Garanina, 2013), focused on the practices of IC approaches rather than on its theoretical conceptualisation. The ICMM has been developed under the "Quality Assurance in Higher Education through Habilitation and Auditing" project framework, initiated by the Executive Agency for Higher Education and Research Funding of Romania (EUFISCDI). Three Mutual Learning Workshops (MLWs) were organised as a mean to bring together 15 international experts and practitioners to share their views and experience on IC reporting and setting up task forces.

Findings – An ICMM, which is a flexible model of implementing IC approaches within public universities, is developed. The ICMM provides a theoretical continuum along which the process of maturity can be developed incrementally from one level to the next, moving from IC data collection, awareness of IC, adjustment of IC specific indicators, measurement of IC, reporting of IC, interpretation and decision making, strategy and planning.

This paper is based on research conducted during the course of Mutual Learning Workshops co-funded by the Romanian Executive Agency for Higher Education and Research Funding of Romania (EUFISCDI) and the European Social Funds (Sectoral Operation Programme Human Resources Development 2007-2013) under the the "Quality Assurance in Higher Education through Habilitation and Auditing" project framework. The authors would like to thank the anonymous reviewers for their suggestions and the Guest Editor Professor John Dumay for his valuable comments that greatly improved the final version of the manuscript.

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Research limitations/implications – Future research needs to conduct empirical studies in universities to generalise the effectiveness of the ICMM model and guidelines for implementation.
Practical implications – The ICMM provides a staged framework to initiate a step-by-step change within a university based upon its current level of IC management maturity and its IC value creation dynamics. It allows universities to follow different paths, not necessarily a linear sequence.
Originality/value – Although several methods for IC measurement and management exist, most of these cannot accommodate the trade-off between the comparability aims and the efforts to capture the institution's uniqueness when designing an IC model.

Keywords Public sector, Intellectual capital management, Strategic management, Universities, Maturity Model, Intellectual capital

Paper type Research paper

Introduction

During the last decade there has been increasing attention paid to intellectual capital (IC) in the management literature (e.g. Guthrie *et al.*, 2004; Hunter *et al.*, 2005; Tan *et al.*, 2008), starting from the assumption that the economic growth of knowledge-based economies is primarily led by intangibles (Lev, 2001). Guthrie *et al.*'s (2012) review indicates a wide spread of IC research in different organisational types including local government, hospitals, government departments, research organisations, third sector, cultural and heritage organisations, police departments, universities and regional clusters. Despite these contributions, the least popular categories seems to be the public sector and not-for-profit, meaning that there are still research opportunities in these areas (Guthrie *et al.*, 2012).

Universities represent an interesting area of investigation because they are considered critical players in the knowledge-based society and are at the core of the policy agenda at national and EU level. The "Europe 2020" Strategy recognised explicitly the central role of universities in helping Europe to become a smarter, greener and more inclusive economy (European Commission, 2010). Moreover, universities have a pivotal role in regional development and significant potential in the development and implementation of Smart Specialisation Strategies (S3), which are key in the new Cohesion Policy framework (Kempton *et al.*, 2013). Despite the general policy recommendations towards the implementation of new management tools and governance modes, in the realm of practice, most European universities are trying to cope with increasing social and policy demands without significant changes in the way they manage their internal affairs (Elena and Paloma Sánchez, 2013; Ramirez Corcoles *et al.*, 2011). Increasing stakeholder demands for greater transparency, competition between universities and greater institutional autonomy push universities towards organisational innovations in designing management and performance systems. New performance and reporting systems allow public sector institutions, and universities in particular, to be in a better position to create transparency about the use of public funds, explain the achievements of research, training, innovation and their benefits to stakeholders, illustrate the development of intangible assets, reveal leverage effects and externalities, communicate (new) organisational values, and demonstrate their competitiveness (Warden, 2003).

In research centres and universities, the key issue at stake is the effective management of intangible assets and IC, which constitutes the largest proportion of universities' assets (Secundo *et al.*, 2010; Paloma Sánchez *et al.*, 2009). In such organisations, "the value of IC […] should be measured in terms of its direct or indirect social value" (Castellanos and Rodriguez, 2004, pp. 479-480). Consistent with Guthrie *et al.* (2004) and Mouritsen *et al.* (2004), an IC framework represents a significant attempt to meet the new demands of public institutions going beyond the New Public Management (NPM) focus, as it can help

to identify universities' organisational path to create value and can be used as a controlling and monitoring instrument (Leitner, 2004; Altenburger and Schaffhauser-Linzatti, 2006).

During the last two decades, some attempts have been made to apply IC models in universities and research centres, especially in European countries (Leitner *et al.*, 2014; Ramirez and Gordillo, 2014; Wu *et al.*, 2012; Veltri *et al.*, 2012; Nava and Mercado, 2011; Secundo *et al.*, 2010; Ramírez, 2010; Brătianu, 2009; Paloma Sánchez *et al.*, 2009; Ramırez *et al.*, 2007; Observatory of the European University, 2006; Paloma Sánchez and Elena, 2006; Leitner, 2004; Leitner and Warden, 2004). Recently, Dumay (2009a) criticised the apparent quest to develop more IC frameworks because a plethora of IC measurement frameworks already exists (Sveiby, 2010). Additionally, Dumay (2009b, p. 489) "openly questions the need to develop further IC theory and advocates a way forward by outlining a critical approach to researching and implementing IC in practice". A third stage of IC research is discussed in the literature (Dumay and Garanina, 2013; Guthrie *et al.*, 2012; Dumay, 2012), in which it is argued that the focus should be on developing IC theory in practice and effective IC management through praxis (Dumay and Garanina, 2013) to provide a better view of the actual impact of IC in action.

Pathways for the adoption of IC management and reporting strongly depend on the characteristics of the university, its previous experience with management tools and its managerial orientation. Thus, what is needed is a more general, flexible and comprehensive model that could be used by universities with different profiles and development stages as higher education (HE) organisations, regardless of its voluntary or obligatory nature to assess the actual impact of IC in action. Following these recommendations, and taking into consideration the proliferation of IC models for universities and the HE sector, mainly designed by individual institutions and implemented on voluntary basis (Paloma Sánchez *et al.*, 2009), our concern is focused on the design of an IC model suitable for accommodating the trade-off between the comparability aims and the efforts to capture the universities' uniqueness.

The purpose of this paper is to propose an IC Maturity Model (ICMM) for universities, which aims to be a flexible framework for defining and implementing IC measurement and management approaches as part of the whole strategic management approach of the universities. Thus, the ICMM proposes a staged framework to initiate a step-by-step change within a University based upon its current level of IC management maturity. Moreover, the different steps of maturity might be an answer to cope with the huge diversity of European universities, some of which have strong managerial orientation, while others follow a collegial form of governance.

The rest of the paper is structured as follows. Section 2 provides the rationale to understand why IC management is relevant in the context of HE and research institutions. Section 3 presents the research approach and methodology. Section 4 proposes the maturity model for universities, its components, the different stages and the full cycle of IC management. Section 5 discusses some implementation guidelines and finally, Section 6 concludes the paper and emphasises the added value of the model proposed, its limitations and ways of moving forward.

Literature background

Intangible assets and IC are seen as elements essential for value creation in companies (Moustaghfir and Schiuma, 2013) and for nations' economic wealth (Martín-de-Castro *et al.*, 2011; Lev, 2001; Cañibano *et al.*, 2000). IC approaches were first developed at firm-level, mainly as a way to understand the gap between the value of companies on their balance sheets and on the stock market. Not surprisingly, considering that public

organisations have no value in the market, do not operate in a competitive environment and their products and services carry no price, IC approaches were initially understood as having no role to fulfil in the public sector. However, later the concept and tools were progressively extended to public sector and non-profit organisations mainly due to the high degree of "intangibility" of these organisations (Bossi *et al.*, 2005; Mouritsen *et al.*, 2004; Kong and Prior, 2008; Kong 2010). A review of the literature indicates that public managers started to be aware of IC importance and, during the last decades, an increasing number of public organisations and not-for-profit organisations have been making considerable efforts to identify, measure, manage and disclose IC (Kong, 2010; Kong and Prior, 2008).

This section aims to shed some light on this field by examining particularly what IC is in the context of universities, the rationale for proposing IC approaches for these institutions and the evolution of IC research towards the third stage.

Defining IC in the context of universities

A series of researchers have dealt with the development of methods to measure IC and to support IC management and reporting in universities (Silvestri and Veltri, 2011; Siboni *et al.*, 2013). In practical terms, IC strategic management focuses on the ways to visualise and make use of individual and organisational resources and capacities in a holistic manner, with a focus on intangible assets, and on how to develop in a sustainable manner such resources and activities. From an organisational point of view, the term "IC" refers to the resources on which the organisation relies in the broadest sense, including not only human capital (HC) resources, but those of the organisation itself (structural capital (SC)) and its relations with its external stakeholders and its general environment (relational capital (RC)) (MERITUM, 2002). However, there has been wide agreement that IC can be conceived as the amount of not-physical resources, available internally and externally, for combining the organisation's tangible, human and financial resources, in order to produce value for stakeholders and obtain a sustainable competitive advantage (European Commission, 2006). Hence, "it is the set of knowledge that creates, or can create in the future, value for an organization" (Castellanos and Rodriguez, 2004, p. 479). In doing so, IC has been considered both as the result of an organisation's research and development activities, and as the driver that enables the creation of greater value from those activities (European Commission, 2006). Moreover, IC could be described as intellectual material that has been formalised, captured and leveraged to produce higher valued assets (Schiuma, 2009).

Without doubt, the tripartite classification is the one that has the widest recognition in the specialised literature, structuring IC in three blocks: HC, SC or organisational capital and RC.

In the context of universities, the tripartite IC classification would be as follows:

- HC refers to the intangible value that resides in the individual competencies; this includes the expertise, knowledge and experiences of researchers, professors, technical staff, students and administrative staff.
- SC comprises the resources that are found in the organisation itself, that is, what remains when academic staff and students leave. This includes, among others, databases, intellectual property, research projects, research infrastructure, research and education processes and routines, university culture and governance principles.

- RC refers to the intangible resources and capabilities able to generate value linked to the university's internal and external relations. This includes its relations with public and private partners, position and image in networks, its academic prestigious, its brand, partnerships with the business sector and regional governments, its links with non-profit organisation and civil society in general, collaborations with national and international research centres, networks and alliances, attractiveness as a place to study and to work, etc.

Looking at the three dimensions separately is insufficient to understand IC. HC, RC and SC can be useful for organisations in general only if they are connected. Thus a fourth dimension to consider has been introduced, to highlight that in knowledge intensive organisations like universities and research centres, the three IC dimensions are related to each other (Habersam and Piber, 2003). Moreover, as with private organisations, the weight, the role and the internal meaning of each IC component differs depending on the university's profile, mission and vision. Accordingly, those universities defined as research-intensive will emphasise the critical role of consolidated researchers (HC), publication records of the research personnel (SC), and networks with prestigious universities (SC); while, the entrepreneurial universities will focus on personnel with an entrepreneurial mind-set and involved in business oriented activities (HC), creation of spin-off (SC) and partnership agreements with the private sector (RC); and teaching universities will concentrate their attention in attracting the best professors and students (HC), develop competitive graduate and post-graduate programmes (SC) and partnerships agreements with prestigious university for student mobility (RC).

Beyond the different types of universities, each university (even those classified under the same typology) has a different managerial approach and maturity level in terms of management of intangibles and IC depending on the national law and regulations procedures of the country in which the university is located.

The IC value creation dynamics in university

IC management for universities is based on the premise that production and dissemination of knowledge could be measured and should be managed. IC management for universities is deeply embedded within broader public sector reforms and particularly the NPM doctrine (Elena-Perez *et al.*, 2014). NPM proposes that public organisations should introduce managerial processes from the private sector, following their successful practices. In particular, this approach demonstrates how the concept and the practice developed in private companies can be used also in the public sector (Hood, 1991; Vienažindiene and Ciarniene, 2007). Hence, it is not surprising that attempts to systematically introduce IC management in Austrian universities were part of broader package of NPM-inspired reforms (Leitner *et al.*, 2014). IC management systems could be viewed as a performance management system that has been adapted and contextualised for HE. They both serve as management tools and both involve data collection, analysis, decision making and information-inspired action. Nevertheless, one important difference should be noted. While performance management systems put strong emphasis on outputs and outcomes, IC management systems, on the other hand, emphasise "capital", that is, inputs and processes (although also involve outcome indicators). In this regard, IC management could be viewed as a "sibling" of post-NPM doctrines.

The need for universities to have a greater involvement with their wider community and the general concern to ensure comparisons and benchmarking among them, makes advisable the management and disclosure of information on IC

(Ramırez Corcoles *et al.*, 2011). General methods for identifying, evaluating, managing and reporting on intangibles within universities finds its justification on the one hand in the political and managerial challenges that universities are facing (Harayama, 1997; Jones *et al.*, 2009; Parker, 2011; Veltri *et al.*, 2012), and, on the other hand, in the fact that their most valuable resources are researchers, students and their relations and organisational routine.

Additionally, we can mention a number of other reasons why IC management tools have significant potential for universities (Elena and Warden, 2011). Universities are provided with more autonomy to manage their own affairs, not only academic but also financial, to redefine their own internal structures, which necessarily requires new management and reporting systems. Moreover, universities have to be more transparent and, thus, to disseminate more information to stakeholders (researchers and teaching, students, funding bodies, governmental agencies, labour market, and society as a whole). The increasing cooperation between universities and firms has resulted in the demand for similar processes of evaluation for both players. Accordingly, universities would have to implement new management and reporting systems, which necessarily incorporate intangibles. Indeed, IC management can help to shift the strategic focus of universities towards intellectual resources and enhance their capability to adapt to the challenges posed by the non-profit environment they are operating in. Finally, IC should play a key role in human resource management within organisations, thereby also addressing the organisational factors (SC) important to stimulate employees' creativity.

In general terms, the benefits of implementing an IC management model fall into two categories (Marr and Chatzkel, 2004; European Commission, 2006): first, its potential to function as a management tool to help develop and allocate resources, create strategy, monitor the development of the organisation's results, and facilitate decision making; and second, its potential to function as a communication and reporting tool linking the institution to the stakeholders and as a way to attract resources – financial, human and technological. All these typologies of benefits can be envisaged within the different IC management approach and framework developed and applied within the different stages of IC research.

IC management in universities: moving towards the third stage of IC research

IC as an innovative management approach is a very relevant topic in theory and practice. Over the years, IC research has progressively changed its focus: three stages of IC research can be discussed.

The first and the second stage of IC research

Originally, Petty and Guthrie (2000) outlined two stages associated with developing IC as a research field. The first stage of IC research focused on raising awareness and understanding IC's potential for creating and managing a sustainable competitive advantage in private organisations. This stage is grounded in the work of practitioners in the 1980s and 1990s. The main focus was awareness about IC as something significant to be measured and reported, but with little empirical research provided in support (Petty and Guthrie, 2000). The output of this research was the creation of frameworks and guidelines, such as the Skandia framework (Skandia, 1994), the MERITUM Project (2002) and the Danish guidelines (Mouritsen *et al.*, 2003).

The Danish guidelines can be applied as an instrument for IC management as they acknowledge the need for knowledge management initiatives and define a set of indicators to measure and follow up. They were commissioned in 1998 by the Danish

Agency for Trade and Industry (DATI) through a project for preparing IC statements in companies. The document Intellectual Capital Statement was published in 2003 and was tested by a mixed sample of 80 Danish firms. In the same period, the Measuring Intangibles to Understand and Improve Innovation Management (MERITUM) project saw the participation of Denmark, Finland, France, Norway, Spain and Sweden to develop a set of guidelines to measure, manage and disclose information on intangibles (MERITUM, 2002). As results of the these research activities, the guidelines were published in 2001 consisting of three components: first, a conceptual framework comprising a set of definitions and the classification of intangibles; second, a management model for the identification, measurement and management of intangibles; and three a framework for an IC report describing how intangible resources and activities of a company are linked to the achievement of strategic objectives. In this stage, the "grand theories" (Dumay, 2012) were used to create awareness of IC concepts (Dumay and Garanina , 2013) and no significant empirical research was discussed (Petty and Guthrie, 2000, p. 162).

In IC's second stage it is connected to strategic management and evidence is gathered to justify its use (Petty and Guthrie, 2000, pp. 155-156). In this stage a plethora of IC frameworks has been applied in practice to demonstrate their potential value creation impacts. Different classifications were created, which helped to define and group different methods of IC evaluation (Boedker *et al.*, 2008; Ricceri, 2008). As a result by the mid-2000s more than 50 methods were created (Pike and Roos, 2007; Sveiby, 2010).

Probably the most comprehensive effort of this second stage, the so called ICU Report, was developed by the Observatory of the European University (2006) to provide a comprehensive and homogenous model for managing and reporting IC in universities. As proposed by the ICU Report (OEU, 2006; Paloma Sánchez *et al.*, 2009), a proper IC management and reporting tool has to take into consideration three elements: first, the vision of the institution, which includes the main general objectives, the strategy and the key drivers to reach them; second, the intangible resources and activities that the institution can mobilise and the different activities undertaken or planned to improve them, and third, the system of indicators defined to allow the internal and external bodies to assess the performance and estimate the future of the institution correctly. Despite efforts dedicated to developing a comprehensive framework for IC management and disclosure, the attempts to make the ICU Report a reality show several shortcomings in the implementation process, mainly related to internal characteristics of the institutions, such as the definition of the university's boundaries and profile, the level of involvement of managers and their experience with similar tools or the resolution of conflicting objectives within the institution (Paloma Sánchez *et al.*, 2009).

Another result of this stage is the EU Commission action in 2004 to set up a high-level expert group to propose measures to stimulate the reporting of IC in research-intensive small and medium enterprises (SME). The result was the document RICARDIS – Reporting IC to Augment Research, Development and Innovation in SMEs in which IC reporting by companies and other organisations such as universities is highlighted as being paramount in the knowledge economy. The most relevant critique of the second stage research is the interest in only "the good story" of measuring intangibles and IC and thus leaving considerable space for a more critical examination (Alcaniz *et al.*, 2011). Recently, a considerable number of scholars has suggested adopting a performative approach and orienting research more specifically to analyse how IC works in organisations, how it manifests itself, and how people, processes and relationships are mobilised in relation to it (Cuganesan, 2005; Mouritsen, 2006; Cuganesan *et al.*, 2007; Dumay, 2009a).

The third stage of IC research

Finally, a third stage of IC research was gaining impetus to study how organisations, understand, adapt and apply IC as a management technology (Guthrie *et al.*, 2012), especially in cases of attempting to manage IC for the first time. Since 2004 there are constant calls for the critical examination of how IC evolves in practice over time (Chatzkel, 2004; Mouritsen, 2006; Mouritsen and Roslender, 2009; Guthrie *et al.* (2012).

Advanced models (Chiucchi, 2004) developed in the third stage adopted the evolved notion of IC as a dynamic system on intangibles resources based on knowledge (Veltri *et al.*, 2012). In these kinds of models, attention is focused on the interactions between the IC components and intangible activities essential in the production, maintenance and development of intangible resources (Silvestri and Veltri, 2011). The assumption behind these models is that measurement of IC is necessary for the management of knowledge, and their main aim is to identify the paths of an organisation's value creation based on knowledge (Veltri *et al.*, 2012). Some features are considered relevant when analysing and defining an integrated IC management model: the potential value of IC, its dynamic and the organisation-specific nature. Understanding these factors in the context of universities means that as regards the first feature, the potential value of IC, IC components have to interact with each other and with tangible factors. Furthermore, the dynamic nature implies that IC is a concept in evolution, which undergoes changes over time and which must be constantly understood and interpreted (Kianto, 2007). The implications for researchers and practitioners are that an exhaustive list of IC components does not exist, due to these constant changes of classification (Grojer, 2001). The organisation-specific nature of IC also implies that IC indicators are specific for each single organisation, sector, industry, typology, size of organisation, etc. Even the more accredited guidelines for drawing up an IC report do not propose an exhaustive list but include only some organisations' specific examples. In the context of HE institutions and universities, the challenge is to combine flexibility and adaptation to the fast-changing environment, which necessarily implies the introduction of management tools.

Dumay and Rooney (2011a, p. 344) found that "that it is possible to effectively implement IC practices without necessarily needing concrete IC measures because organisational measurement needs continually evolve depending on factors such as the characteristics of individual organisations; changing internal and external political, social and economic environments; and evolving business plans and strategies". Following this, another essential aspect of the third stage is empirically researching IC practices inside organisations rather than IC measures (Guthrie *et al.*, 2012).

In the wide range of public organisations several studies have highlighted a lack of research with reference to state universities (Hellstrom and Husted, 2004; Paloma Sánchez and Elena, 2006; Bezhani, 2010), and several calls for research have been published to improve the managing of IC in those organisations (e.g. Castellanos and Rodrıguez, 2004; Leitner, 2004; Paloma Sánchez *et al.*, 2009; Secundo *et al.*, 2010). Despite the benefits and potential of IC approaches, in the realm of practice, universities face serious difficulties when trying to implement a "business" mind-set to steer the organisation towards a successful future. They are complex organisations dealing with a multi-mission approach, task complexity, professionalism and administrative values (Sporn, 1999). Furthermore, the way European universities are governed, often based on collegial models, hinders the implementation of new managerial decision-making processes and tools (Elena and Warden, 2011). There are also important external constraints, such as the changing role of the state, public budget pressures and new societal demands. In other words, IC management approaches developed in the first

two stages of IC research were not able to provide a solution for the huge diversity of universities in Europe. Paloma Sánchez *et al.* (2009, p. 320) argued that some of these shortcomings have led to the idea that "it would be better to build specific models for each organisation, which could only be done with voluntary initiatives". Therefore, from a third stage IC research perspective it would be fruitful to find a framework for managing and implementing IC through a more strategic managerial approach looking at the different stage of IC maturity in universities and research centres.

Research aim and approach

Based on the premises outlined above and on the idea that "one solution does not fit all" (Secundo *et al.*, 2010), the research aims of this paper are to develop a flexible framework able to adapt to the individual characteristics of different institutions and to different stages of managerial development. This provides an opportunity for IC approaches to be reinvented and to facilitate a more balanced approach among management, measurement and reporting to contribute to the strategic management of the universities.

The research approach followed is based on what has been called the "third stage" of IC research (Dumay and Garanina, 2013), which focused on the praxis of IC approaches and models rather than on its theoretical conceptualisation, focusing on the deeper managerial implications of how to use IC in the strategic management of universities, taking into account their different types and development stages. When dealing with IC in the public sector the gap between theory and practice is very broad. The benefits of IC approaches advocated by the literature and policy recommendations are clear but clash with the daily life and the reality of these institutions.

Hence, our research approach is practice-oriented and has been produced under the "Quality Assurance in Higher Education through Habilitation and Auditing"[1] project framework run by the Executive Agency for Higher Education and Research Funding of Romania (EUFISCDI) and co-funded by the European Social Funds (Sectoral Operation Programme Human Resources Development 2007-2013).

To this purpose, and with the aim to cover the highlighted research gap, three Mutual Learning Workshops (MLWs) were organised as a mean to bring together international experts and practitioners to share their views and experience on IC reporting and setting up task forces (see also Leitner *et al.*, 2014). The MLW took place in Bucharest (Romania) from October 2012 to May 2013 involving 15 experts from across Europe. We used this qualitative research approach to compare the rich and diverse experiences from different HE institutions and countries concerning the stage within the reform process realised in almost all European countries in the past (de Boer *et al.*, 2008) and the type of university. We aimed to analyse and compare different cases and thus adopted a purposeful sampling approach as suggested by Patton (1990). The organisation of the workshops was coordinated by one of the authors of this paper. The experts were selected from eight different European countries (Austria, Greece, Italy, Latvia, Lithuania, Poland, Romania, Spain) and were all researchers with a background in HE research and the evaluation of IC. In addition, they were all involved in practical exercises concerning the implementing of IC management systems for HE institutions and thus contributed practical experience. All authors of this paper participated in the workshops and each participant worked out a presentation and synthesised experiences from each country by short papers and notes.

The mutual learning methodology developed during the mutual learning workshops is a valid tool to provide a common space, a "platform", for experts, practitioners, managers and policy-makers to reflect upon, share, consolidate and transfer experiences and lessons. This methodology has proven to be highly effective in other areas of high

relevance and policy impact, such as the definition and implementation of Smart Specialisation Strategies (S3)[2].

The expert team conducted the research along three stages:

- Stage 1: mutual learning from IC management in European Universities. In this phase the existing approaches and lessons with IC management at universities across Europe were discussed and synthesised among the experts' group. Analysis included experience from Spain, Austria, Greece, Italy, Romania, Lithuania, Poland and Latvia. During this process each expert presented at the first mutual learning workshop (held in October 2012) experiences from each country and case focusing on the institutional context, the purpose of IC management, the IC models and taxonomies used, the implementation process, and the practical use of IC management and reporting systems. Each participant documented the findings from each case by preparing presentation materials and short papers. The data collected was analysed in an iterative and discursive process by the team. This was mainly done by combining within-case analysis and cross-case analysis (Trochim, 1998; Yin, 1999). Therefore, we were looking for similarities as well as significant differences between the cases and factors concerning the purpose, IC models, institutional context, implementation strategy, and experiences.
- Stage 2: identification of the main shortcomings of the existing models and instruments for IC reporting and management. A common discussion and analysis of existing approaches within the second workshop (held in March 2013) allowed the definition of the requirements for a new model to be developed. The lessons were synthesised by the team around the following four key issues: first, critical review of functions and purposes of IC management and reporting models from the university perspective; second, the need to re-orient and adapt IC models and frameworks to individual institutions; third, the definition of indicators for considering the trade-off between comparability purposes and usefulness for managers; and fourth, shortcomings of the implementation process. Each participant again prepared in advance presentation material and short papers reflecting the findings of the first workshop in the context of the individual cases and countries.
- Stage 3: development of the model. In the third workshop (held in May 2013), the IC model was defined taking into account the features of universities and the operational requirements for very different universities concerning their management development and organisational culture. The participants reviewed the existing guidelines and publications dealing with the process of implementation of IC management and reporting systems, but also more generally, for the implementation and introduction of management systems. A common group discussion and critical debates about the pros and cons of the different approaches finally resulted in an IC maturity model presented in this paper. The final result is the Blueprints for IC Reporting for Universities along with a set of guidelines for IC management implementation in European universities (Leitner *et al.*, 2014).

Findings: an ICMM for universities

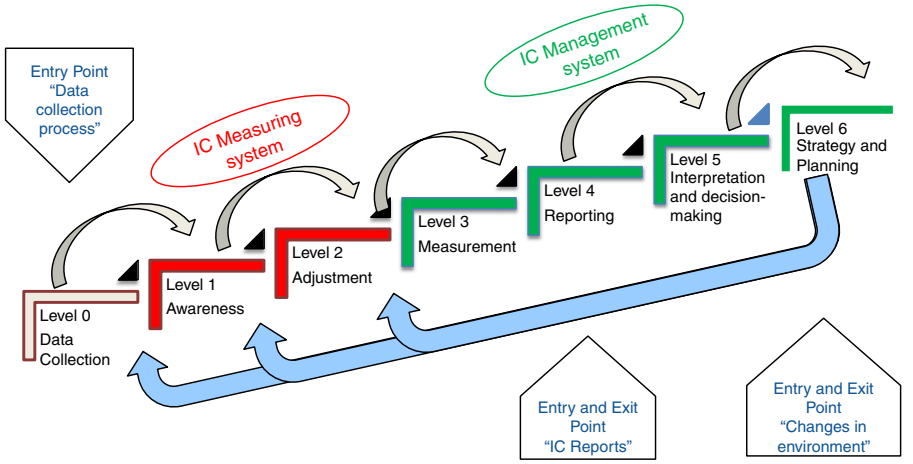
As discussed in previous sections, the European HE landscape is characterised by diversity in terms of missions, forms of governance, level of autonomy, capacities and existing processes for management of tangible and intangible assets. This suggests that

the adoption of IC management systems should be flexible and tailored to individual needs and capabilities; to this end we suggest an approach for IC management based on the concept of maturity models.

Maturity models were initially developed in computer programming with the aim of ensuring systematic development of software and inter-operability of programmes (Van Looy *et al.*, 2010). Subsequently such models were applied to monitor and manage the introduction of a broad range of organisational innovations: from new product developments to e-learning or open source. Maturity models provide a flexible framework for the introduction and management of innovations along a continuum of maturity levels: from ad hoc activities carried out by "heroic individuals" to systematic implementation and subsequent continuous improvements. Depending on capabilities and individual characteristics, organisations typically start at different levels and proceed to the next stages at varying speed. Hence, maturity models serve several functions: first, initial appraisal of status quo (i.e. identification of maturity level before introduction of innovations); second, step-by-step roadmaps on how to proceed; third, instruments for monitoring the progress.

The proposed ICMM for Universities has been constructed in line with three guiding principles (see Figure 1). First, IC management systems should be introduced considering the mission, objectives and unique features of the university. Hence, there are multiple "entry points". In other words, universities are likely to start the definition and implementation of an IC management approach from different levels (e.g. for the data collection process or from the reporting of IC information or even just from a change in the environment). Second, fully functioning IC management system is an iterative rather than a linear process. IC measurements should be systematically integrated into decision-making processes and periodically reviewed in line with shifting strategic and operational objectives. Third, IC management is not "yet another management tool": a fully mature system should be at the heart of strategic and operational decisions taken by the university.

As Figure 1 illustrates, the full cycle of maturity model includes seven levels to improve maturity, three entry points (data collection process, IC reports and Strategy



Source: Secundo *et al.* (2014)

Figure 1. ICMM for universities: paths for IC definition and implementation

and Planning) and two exit points (IC reports and changes in environment). As mentioned above, the entry point implies that the institution can start with the model at different levels, and not necessarily from level 0, given the different degrees of its management maturity. Those universities not familiar with the IC approach and still with a need to homogenise databases and gather further data will most likely start from level 0, while for instance universities already reporting on IC (such as could be the case of Austrian and Spanish universities) can start from Level 4. On the contrary, exit points means that the institution could stop the process and not finalise the full maturity cycle for different reasons. It could be the case of the institution that would like to stop the process when the target of reporting has been accomplished or when changes in the environment impose reorientation of managerial priorities (new regulations from the governing body, new accountability purpose or innovation in quality assurance and accreditation processes).

The seven levels of IC maturity model are as follows (Secundo *et al.*, 2014):

- Level 0: data collection. All European universities collect, to greater or lesser degree, some data for accounting, management and/or external accountability purposes (e.g. number of students, degrees awarded, number of research projects, number of staff, etc.). Some of these indicators could be related to IC, but are neither conceptualised as such, nor used in the management process. Such data collection process (either for management or reporting purposes) represents a typical entry point for IC measurement and management. The data collection could be developed at department, school or university wide level depending on the level of awareness and the voluntary or mandatory status of the approach.
- Level 1: awareness of IC. Universities are producing knowledge, but a rather small proportion of them can clearly identify unique intangibles that differentiate them from other universities or similar institutions. Hence the first level of implementation of IC management systems involves the definition of key intellectual assets unique to a university. These assets could be different from one university to the other according to their mission, engagement in the regional community and ranking at national and international level. This process is typically guided by strategic objectives and the available information on current strengths and weaknesses. Awareness of IC may be the result of long-term strategic orientation and, over time, could lead to the next level: adjustment of data collection and monitoring system. Data could be identified with different aims: to improve performance of a specific university action, to assess the performance at internal level (among the different departments) or to afford external comparability purposes. All these initiatives should be carefully described and organised around a whole strategic overall aim.
- Level 2: adjustment of monitoring systems. Once the objectives and scope of IC monitoring is defined, indicators and routines for data collection are reviewed so as to explicitly incorporate relevant dimensions of organisational IC. This includes systemic review of all the data collected by a university, relinquishing of irrelevant indicators and introduction of new ones to reflect the strengths and weaknesses of the IC of a university. While consensus building on unique IC dimensions (awareness level) is likely to involve broad participation from the academic community, optimisation of monitoring systems is usually performed by the management of the university with the final goal to develop the IC assessment criteria.

- Level 3: measurement of IC. Measurement involves systemic collection of data in line with *ex ante* defined indicators. This process involves considerable costs to university administrators and the academic community, who have to provide additional information. Well-functioning measurement systems are based on a limited set of indicators and a shared vision regarding the rationale behind data collection. If levels 1 (awareness) and 2 (optimisation) are immature, the measurement process is likely to be problematic. On the one hand, if there is lack of consensus on the objectives of IC management, the academic community may decline to provide additional information. On the other hand, definition of the right indicators and measurement process can create incentives for the academic community to align their individual agendas with that of the university.
- Level 4: reporting of IC. Publication of IC reports could be an indication that university has reached the fourth level of the ICMM. Importantly, the reports should serve two functions: accountability of external stakeholders as well as tax-payers at large; and provide vital information for managerial decisions (OEU, 2006). All too often information on IC is used only for external accountability purposes. This stage could also represent an exit point, that is, the IC measurement system is not used as an integral part of IC management.
- Level 5: interpretation and decision-making. The sixth maturity level involves use of information on IC in everyday decision making. It should constitute an integral part of human resource recruitment policies and investment decisions, as well as set the framework for deliberations on the internationalisation strategy of the university, the development of innovative curriculum and new research agenda.
- Level 6: strategy and planning. A fully functioning IC management system involves periodic reassessment and reinvention of universities' unique strengths, long- and short-term objectives and means to achieve them. Hence, the last maturity level involves the use of information on intellectual assets to review universities' internal processes, redefine mission, values, objectives and strategic plans. These decisions should be reflected in the next planning cycle: what are the core assets and how they should be monitored and managed to improve mission and performance? At this level, the IC approach can be considered at the same time as the strategic mission and the performance management tool for the university (Secundo *et al.*, 2010).

The strategy and planning phase could also reflect an entry point to IC management. Radical shifts in strategic orientation of the university (typically caused by factors such as economic crisis, change in regulatory framework or appointment of a new Rector) could create a need to introduce IC management as an instrument to flesh-out universities' mission or reallocate resources.

Some guidelines for the adoption and implementation of the ICMM are detailed for each maturity level (see Table I). The ICMM implementation process could follow an annual cycle or biannual cycle according to the needs of universities and the laws of the country where the university is located: more advanced universities could start from the strategic planning of the intangible resources and then develop into the three stages as shown in Figure 1. Other universities could start from IC measurement, other could be involved in IC awareness. In any case, the ICMM is a circular process: the results of the implementation of each level return to the university's management through a feedback report so that it can make necessary changes and re-orient strategy.

Level	Objective	Guidelines for ICMM implementation
0: Data collection	Collect the IC data available	Adopt a top down approach to standardise the data collection to avoid mismatch among heterogeneous data
1: IC awareness	Identification of the key intangible assets in a university	The awareness of IC involves a wide community of University's governing body including the head of Department, Head of School, Rector and Managing Director of post graduate programs. The university's strategic objectives will guide the collection of data about the distinguishing intangible assets created and measured for each teaching, research and innovation process
2: Adjustment of monitoring systems	Identifying the intangible assets of the university which stakeholders demand most	A questionnaire can be designed and sent to every member of the governing body of universities in order to identify intangible items they consider essential for universities and to set up the set of IC indicators. The IC indicators should be collected within the University's information System
3: Measurement of IC	Systemic collection of data in line with ex ante defined indicators	The IC measurement could follow the national law guidelines or the general recommendation deriving from the international Agency for quality assurance. This process can be adapted according to the country where the university is located
4: Reporting of IC	Providing a complete report containing the IC strategy, implementation and indicators	Reporting can be developed from an internal University body taking in consideration the general recommendation deriving from the environmental factor, law and regulation of the country where the university is located
5: Interpretation and decision-making	Decision making process starting from the IC recommendation	The Interpretation process can be done from the different University's stakeholders. Decision making process will regard the students, the faculty and researchers, the technicians, the university board, the local public institution and the national funding sources to improve or not the University overall mission
6: Strategy and planning	Reassessment and reinvention of universities' long- and short-term objectives and means to achieve them	The University's Rector and Governing body should be able to set up new directions for the strategic planning starting from the guidelines received form the most valuable assets

Table I.
Implementation guidelines for ICMM

Discussion

As described above the ICMM has been framed within the third stage of IC research (Dumay and Garanina, 2013), since it highlights the praxis of IC approaches and models rather than relying on theoretical conceptualisation. The advantages of IC management refer to the opportunities to move beyond the metrics and measurements and to focus on the strategy process in practice, grounded on IC assets (Edvinsson, 2013). Traditional measurement tools and frameworks do not capture the flow of intangible assets and their impact on value creating dimensions over time (Guthrie *et al.*, 2012). In overcoming these limitations, the ICMM is consistent with the third stage of IC research because it allows the implementation and examination of how the IC approach works in practice within the university context to create stakeholder value. The ICMM could be interpreted as a high level strategy rather than a new IC model, since it can be implemented also in the context of organisations already using some particular model

or framework. The ICMM sustains the understanding of the actual impact of IC in action when moving from the lower level to the higher level, and allows the assessment of IC value at university level to provide insights for all stakeholders involved in the decision-making process. Thereby, the ICMM can be better adopted to the very different types of universities (e.g. more research oriented, more teaching oriented, public, private) and their level of autonomy (Braun and Merrien, 1999). Hence, insights into the impact of IC practice can be used to reflect on and select what worked and what did not. The ICMM gives researchers and practitioners the ability to reflect on the crucial role of IC management in: guiding the university board over the long term for establishing plans, clarifying the scope of the teaching, research and third mission process, allocating resources and assessing performance (Kim and Grant, 2010); communicating and enhancing the understanding of stakeholders of the value creation process and outcomes. Although there is a broad consensus on the benefits of IC management and reporting, the implementation of such systems is problematic.

To tackle the problem, we have proposed ICMM specifically tailored for implementation in European universities where it can be easily personalised to the needs of the bottom-up approach to gathering insights into the workings of IC, or to the need to assess the interaction of IC elements rather than trying to allocate abstract IC measures (Dumay and Garanina, 2013). It has three main benefits. First, the model provides practical guidelines on how to strategically manage IC assets and how to effectively assess a maturity level to include IC management within the overall strategic management view. This model can encourage researchers, practitioners, and representatives of the governing body to understand the implementation processes of IC approach taking in considering the measurement and management perspective at the same time.

Second, the ICMM points to key IC managerial areas that must be tackled. This is because the IC components are significantly associated with university maturity levels as well as organisational performance (Melville *et al.*, 2004). The model can be used by the huge diversity of the European universities having different levels of adoption of IC approaches (IC disclosure, IC reporting, IC measurement, IC management, etc.).

Third, the ICMM highlights the process-oriented approach by employing assessment principles of the IC. Each maturity level, for example, matches outcomes with a maturity level (e.g. IC data collection – initial). This attempt will help practitioners and policy makers to develop process-oriented approaches, to compare the university process level with other institutions and to provide information to stakeholders. Level 4, reporting of IC can be diversified according to the needs of the stakeholder: if the focus is on internal management, then just some indicators will be highlighted to allow the university governance to take decisions; when the need to compare different universities arises, then some selected measures will allow external benchmarking. Therefore, pathways for adoption of IC management and reporting strongly depend on the characteristics of the university, its previous experience with management tools and its managerial orientation.

On the other hand, adoption of ICMM faces four risks and limitations. First, successful implementation is based on a premise that universities have wide strategic autonomy, that is, they can set their own strategic and operational objectives. If these are set by political bodies (e.g. through performance contracts), then the scope for and value of ICMM diminishes.

Second, implementation of ICMM requires strong leadership and ownership of results. The largest investments are done at initial stages, while full benefits are reaped only at stages 5 (interpretation and decision making) and 6 (strategy and planning).

Hence, in the absence of leadership universities could get stuck at initial phases or abandon the whole process all together.

Third, there is a risk of developing multiple managerial levels as organisations move from one maturity level to another. The IC management and reporting process should incorporate rather than operate in parallel to other managerial instruments. If movement between different maturity levels does not involve synthesis of "new" and "old" processes and tools, then the benefits of adopting IC management systems are likely to be offset by soaring costs.

Fourth, there is a risk of moving ahead too quickly. In principle it is possible for a university to move from level 0 to level 6 in one budgetary year. This, however, would undercut the hidden value of deliberations and consensus building. Ultimately, effective strategies are not the ones that are written in the shortest possible time, but the ones that successfully mobilise collective efforts that (re)shape an organisation. From these considerations, it is clear that the ICMM proposed move towards a more comprehensive strategic management approach cannot be implemented by a "simple" IC Statement but will be realised by processes and strategy involving all the university's stakeholders according to the level of maturity taken in consideration.

Conclusions and ways forward

The last decade see greater awareness of IC in universities (Siboni *et al.*, 2013) thanks to the increasing adoption of a decision-making model based on IC qualitative models widely adopted in the context of the public sector due to the NPM doctrine. Additionally, since the late 1980s the European university system has undergone a profound change, led by the structural transformations driven by the Bologna Process aimed at increasing the quality of the research system and to make universities more comparable, competitive, dynamic, and transparent (Siboni *et al.*, 2013). This process has resulted in the creation of a European dimension for HE in which universities are moving from traditional academic organisations to new organisational forms known as the "Stakeholder University" (Romano, 2009) or "Entrepreneurial University" (Clark, 1998) requiring innovative academic and administrative management (Weber, 2006). Universities need to take into account new IC management strategies for identifying, measuring and valuing intangibles as part of an overall management perspective. Córcoles *et al.* (2011) affirmed the need for universities to include information on IC in their accounting information systems to allow stakeholders to make the right managerial decisions and create value. Secundo *et al.* (2010, p. 152) also outline that "IC is a metric of performance and the intangible report may well represent for HE and research organisations what the balance sheet and the income statement are for business companies".

According to Abhayawansa (2014, p. 119) "At present, the numerous initiatives on IC reporting provide many interesting and challenging ideas, but arguably have little prospect of widespread adoption. Perhaps, the lack of agreement among academics and practitioners on most aspects of IC reporting including what to report (or what is IC) and how to report, can be blamed for the current moribund status of IC reporting". Nevertheless, the situation is likely to change, because the increasing autonomy and competition among universities and research organisations will oblige universities to position themselves strategically, raise new financial resources and find new ways of accounting for their investments and expenditures. In response to these challenges, universities and research organisations are already implementing new management and reporting systems, which must incorporate intangibles. Accordingly, the reforms have increased the autonomy of universities, providing a central role to performance

measurement and efficiency, leading to the creation of national accreditation agencies and promoting the use of new managerial tools (Sánchez and Elena, 2006).

As argued by Dumay (2009b, 2012) neither practitioners nor the academic community support the universal implementation of any of the proposed frameworks because none of them seems to offer a robust solution to visualise, manage and report IC. The case of universities is even more clear because the wide range of individual experiences of managing and reporting on IC have been, in most cases, stand-alone practices without continuity over time. The design of an IC model suitable for balancing the trade-off between the comparability aims and the efforts to capture the institution's uniqueness remains a work in progress. To close this gap, and consistent with the third stage of IC research, our analysis pointed out that the pathways for adoption of IC management and reporting strongly depend on the characteristics of the university, its previous experience with management tools and its managerial orientation.

The theoretical contribution of the IC Maturity Model for Universities (ICMM) is the design of a flexible framework for defining and implementing IC approaches allowing people to act, thus shifting IC from theory to practice. The ICMM provides a theoretical continuum along which the process of maturity of the university can develop incrementally from one level to the next, analysing how IC evolves in practice over time. Transitions from lower to higher maturity levels are neither predetermined, nor effortless. Maturity models seem to be useful because they allow organisations and institutions to self- assess the maturity of various aspects of their processes against benchmarks. Specification of a university's IC maturity helps in determining the current attitude towards intangible assets, the state-of-knowledge about IC and finally the university's specific strategy for implementing IC related activities to improve performance. In addition, the model does not strictly follow the traditional rational and linear view of strategic management but also reflects, to some extent, the emergent character of strategy making (e.g. Mintzberg and Waters, 1985; Simons, 1995). Improving strategic management in universities, including IC management, thus has to be considered as an incremental learning process.

Climbing the "maturity ladder" requires at least three preconditions. First, strategic leadership is essential to tackle at least three challenges: inertia in decision-making routines and managerial practices; countering a rather widespread belief that knowledge creation is not susceptible to management, but rather relies on individual efforts of "super-star academics" and autonomy from managerial or bureaucratic "red-tape"; taking tough decisions in reallocating resources in line with the strategic and operational objectives that emerge from interpretations of IC measurement system.

Second, transition between maturity levels requires continuous efforts from the academic community. Hence, it relies on broad consensus on the benefits to justify the costs. All the university stakeholders, starting from the staff, moving to the departments' directors and to the governance body, need to be aware about the benefits resulting from the adoption of the methodologies and strategies of IC management. If the first maturity levels more directly involve the department or faculty staff, the higher levels involve more the strategic management body because they are more expensive both in terms of costs and justification of the benefits. In this case, the university's strategic leadership and governing body should be able to clarify the benefits in terms of performance and should be involved in some sensitisation strategies targeted for different stakeholders.

Third, transitions to higher levels necessitate the introduction of additional analytical, managerial and similar systems. For instance, measurement requires the definition of

indicators, careful analysis of the costs and benefits of collecting each additional data point, review of other monitoring systems to facilitate benchmarking, etc. Development and maintenance of these systems will consume scarce human and financial resources.

A practical contribution of the ICMM is provided in terms of a staged framework to initiate a step-by-step change within a university, based upon its current level of IC management maturity. The application of the model would be a healthy exercise in transparency for these institutions to facilitate access for their stakeholders (university governors, teaching staff, technicians and administrative, students, public administration, institutions and business organisations) to a variety of information, which is relevant to their decision making. So, the ICMM could facilitate universities on the path to presenting information useful to their stakeholders, contributing to a greater transparency and comparability in the HE sector, to help decision-making processes, improve the articulation of public policies and increase transparency in the whole system. Therefore, the originality of the ICMM lies in its adaptation to cope with the huge diversity of European universities, some of which have strong managerial orientation, while others follow a collegial form of governance.

Despite these contributions, we highlight some limitations of this paper. First of all, our conceptual framework is based on an extensive literature review while also involving experts in the field of IC at a university level that. The ICMM was developed within three Mutual Learning Workshops based on a qualitative research approach using the inputs and experiences from various experts from different countries across Europe. Although it would have been possible to involve more experts, we have chosen to discuss the experiences within a smaller group of experts representing eight countries, a number of units often considered as appropriate for meaningful comparisons in the literature (Patton, 1990). However, in the future, empirical studies in universities are needed to generalise the effectiveness of the ICMM model and our suggestions. Second, there is a lack of exploration of critical or standard indicators to manage IC. This paper focused on processes on how to identify, develop and prioritise IC indicators in universities in times of change. It would be worthwhile to discuss standardised indicators that universally could be implemented across various universities in the same countries or across countries.

Future research should include the identification and validation of IC indicators according to the features of the university where the model is applied. To this end, a questionnaire will be sent to members of the governing board of a set of identified universities to identify the different perceptions of each group of stakeholders regarding the importance of disclosing information about IC.

Notes

1. Project co-funded by UEFISDI and European Social Funds (Sectoral Operation Programme Human Resources Development 2007-2013).
2. For more information see the Smart Specialisation Platform peer reviews activities based on the principles of mutual learning workshops: http://s3platform.jrc.ec.europa.eu/peer-review

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