



Conference on

**Trends in the management of human resources
in higher education**

Measuring the intellectual capital of a university

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Introduction

The aim of this paper is to analyse some fundamental challenges regarding the measurement of the intellectual capital (IC) of a university. The main thrust of this paper is that the European, Humboldt-style universities are characterised by low innovation rate, weak links with the industry and poor human resources management policies; for this reason, universities require innovative management approaches.

This paper is not merely a theoretical reflection but also includes some practical views gathered during the project, "The Poznan University of Economics Intellectual Capital Report 2005" conducted by the author for the Poznan University of Economics in Poznan, Poland. Some practical observations and hints are included to provide practical, hands-on knowledge for the benefit of those who would like to pursue a similar exercise at their own university.

The views expressed by the author do not necessarily reflect the views of the Poznan University of Economics. It must also be noted that some of the remarks mentioned in this paper may be specific only to Central-Eastern European Universities and less germane to the Western European universities.

Definition of intellectual capital

The wealth-creating function of Intellectual Capital was recognised long before the seminal works of scholars such as Daniel Bell, Michael Porat, Alvin Toffler or Tom Stonier. As early as 1836, N. Senior wrote: „*The intellectual and moral capital of Great Britain far exceeds all the Material Capital, not only in importance, but in productiveness*”¹. IC comprises a wide spectrum of ideas and perceptions of the immaterial components of organisational assets. In this study, IC is viewed as both an economic and managerial concept.

In popular belief IC is associated with “human capital” or “knowledge.” The terms Intangible Assets, Knowledge Assets/Capital or Intellectual Assets/Capital are often used as synonyms². The term Intangible Assets can often be found in the accounting literature, whereas the term Knowledge Assets is used by economists and IC is used in the management and legal literature, but all refer essentially to the same thing: the intangible value contained in the heads and relationships of employees, management staff, customers and other stakeholders. IC encompasses not only the contents of employees’ minds but also the complex intangible structure that surrounds them and makes the organisation function.

A. Lönnquist and P. Mettanan in their review of the definition of IC identified the following characteristics:³

- It is invisible.
- It is closely related to knowledge and experiences of employees as well as customers and technologies of an organisation,
- It offers better opportunities for an organisation to succeed in the future.

The economic characteristics of IC include the following:

¹ N.Senior, *An Outline of the Science of Political Economy*, Longmans, London 1836 in: P. Quintas, P. Lefrere, G. Jones, *Knowledge Management: a Strategic Agenda*, Long Range Planning, Vol. 30, No.3, p. 386.

² M. Ulmer, *Latest Research on the Valuation of Intellectual Capital – Models, Methods and Their Evaluation*, Doctoral Seminar in Corporate Finance, Universitaet St. Gallen, 2003.

³ A. Lönnquist, P. Mettanan, *Criteria for Sound Intellectual Capital Statements*, Institute of Industrial Management, Tampere University of Technology, Finland.

- IC can pose a large risk element for buyers and sellers of knowledge – sellers do not give samples,
- It is a *debt item*, rather than an asset item since it is borrowed from people, e.g. employees and customers,
- Much of it is not owned or controlled by the organisation, e.g. the knowledge of workers; the boundaries are hard to define. Upton points out those items like workforce or customer satisfaction are harder to describe and bound in a concise fashion. The lack of boundary creates the risk that any measurement will double count. The organisation investing in IC does not retain full ownership of the assets it has created – non-owners, such as employees, can rarely be precluded from enjoying some of the benefits of the investments after they switch employers.
- Intellectual Capital accrues from a plethora of events and investments over a long time span. The cause-effect path of value creation is extremely complex and difficult to trace, e.g. the value of a brand is a result of marketing efforts, favourable market conditions (including the less successful actions of competitors), R&D investments etc.
- It is *non-financial* capital. There is no neutral unit of measurement corresponding to the monetary unit on a balance sheet.
- It is marked by ethical concerns about including human capital on a balance sheet – placing a price on individuals can send a message that employees may be substituted for other forms of capital.
- Since there is no one, single methodology or view on what IC is and how to measure it proliferate, the consensus among the different stakeholders is hard to reach.

Why measure the intellectual capital of a University?

Many now agree that we would rather be “roughly right than precisely wrong. Most executives today are measuring what they can measure because it can be measured. But this is like looking for the lost keys by the light – because there is light – rather than near the car where they were dropped!” (Amidon, 2002).

Using a metaphorical comparison, the measurement of intellectual capital of a university resembles the examination of physical health of the physicians employed in a hospital. It is (wrongly) assumed that all medical staff apply all the latest knowledge relating to their well-being. Similarly, the academic community, as well as the general public, assume that the intellectual capital of a university must be reaching the highest levels of excellence and does not require any kind of interference. The reality falsifies this statement. Today’s universities are slow to innovate. Many business companies such as high-tech start-ups and consultancies produce superior knowledge with practical applications.

The intellectual capital of universities should be measured for the following reasons:

1. The transparency of public institutions should be increased. In a knowledge-based society citizens demand constant and comprehensive access to the information when public funds are allocated.
2. The press ranking lists of universities need to be compared with other benchmarking methodologies which aim at ‘measuring’ rather than ‘ranking’ educational institutions, leaving the final decision on which university is ‘better’ to the reader. Universities should acquire and apply new methods of learning. The transfer of good practices could be increased if universities obtained access to the information on their IC. As Karl-Erik Sveiby (2000) put it: “so entrenched are the traditional measuring paradigms that executives have not even started to explore the most

interesting reason for measuring intangibles; the learning motive.[...]The learning motive promises the highest long-term benefits.”

3. The strengthening of links between universities and industry cannot be possible without introducing a common language. This ‘common ground’ would enable academics and business practitioners to develop mutually beneficial relationships. Words enable deeds.
4. The measurement of IC in universities will bring the ‘ivory-tower philosophy’ of the present researchers closer to the requirements of the public and industry. With a clearly defined set of indicators and reporting methodologies in place, it will be more difficult to conceal the low performance of researchers behind the verbosity of general, content-poor, unstructured statements. The introduction of a common language derived from IC measurement methodologies can be also conducive to the creation of the European Research Area (ERA). The process of building international research consortia may be speeded up if potential partners obtain the full insight into their IC statements.

Motivating senior academic staff to keep up with the fast-moving environment: some academic communities tend to reward their members for past achievements. Unlike in sports or business, a distinguished reputation within the scientific community may be maintained without any meaningful contribution within recent years. For example, Albert Einstein did not make any meaningful scientific contributions after he had turned 40. This cultural characteristic is a rare occurrence in the business world or the world of sports where present standing depends on current results. This over reliance upon past achievements may lead to the discrimination of younger researchers in favour of senior staff with regard to accessing research funds.

How to measure the intellectual capital of a University?

A thorough revision of all the methods for measuring intellectual capital developed in recent years goes beyond the scope of this paper. However, one of the most promising frameworks was developed in Denmark by the Danish Agency for Trade and Industry. It presents intellectual capital in the form of resources, activities and results. Thanks to this taxonomy it is possible to understand the paradox: why well-established European universities do not produce top quality knowledge. The high potential (*resources*) residing in the universities in many cases does not go hand in hand with their low performance (*results*).

The intellectual capital of a university consists of human capital and structural capital. The human capital relates to individual competencies of researchers. In the global economy and a growing demand for qualified research staff, the human capital of universities is very unstable. There is a high risk of brain drain in those universities that do not invest in their human capital. Thus the *activities* section of the measurement tool reflects the processes aiming at the renewal and growth of the strategic resources.

Intellectual capital measures should take into account the different qualities of output – the output of the organisation (e.g. publication, a training course), and the output of the client/user (e.g. problem solved). Thus IC measurement looms as an important instigator for increasing the productivity of knowledge-based work. The system should help the organisations involved to identify what works – and what does not work. Results should not be punitive.

Table 1. IC measurement matrix.

Types >> Categories	What is there? (Resources)	What has been invested? (Activities)	Which objectives have been achieved? (Results)
Human Capital	<ul style="list-style-type: none"> • Number of researchers • Share of researchers in total employment • Average age of a researcher • Women in science (share of women in workforce) • Inbreeding (share of researchers who are graduates of the university) 	<ul style="list-style-type: none"> • Research spending per employee • ITC spending per employee • Time spent in internal seminars per employee 	<ul style="list-style-type: none"> • Number of newly recruited staff • Number of contracts turned down with regret • Staff satisfaction • Staff turnover • Added value per employee • Composite employee satisfaction index • Average number of publications per researcher
Structural Capital	<ul style="list-style-type: none"> • Share of women occupying managerial positions • Number of chairs (departments) • Average employment in a chair (department) • No. of PC per employee 	<ul style="list-style-type: none"> • Total investment in research infrastructure • Success ratio in project acquisition • Research spending per chair (department) • Participation in international conferences • (no. of conferences attended, no. of researchers attending conferences) • No. of research projects underway (including EU projects) 	<ul style="list-style-type: none"> • No. of international students • Share of international staff • Name recognition and reputation (based on press ranking lists) • Student satisfaction index • Number of students • Number of courses • Average number of publications per chair (department)

The indicators describing the intellectual capital of a university should not be presented in a stand-alone form. In the case of The Poznan University of Economics a special structure of presentation was developed in order to create the context for the 30+ indicators collected in the IC report (see table 2).

Table 2. The structure of the IC report.

DESCRIPTION AREAS	Method of description	Underlying theory
Strategic management	The strategic management (SM) barometer	Originally it was planned to use the Balanced Scorecard logic. Eventually, due to the absence of the codification of the appropriate processes a simplified version of the BSC was applied: a list of thirteen areas was defined. Each area was assessed in regards to the scale of implementation (0% - not implemented; 25% - under consideration; 50% - in the process of planning and preparation; 75% - partly implemented, 100% - fully implemented).
Knowledge goals	A narrative	Numerical data on IC has to be balanced with qualitative measures such as descriptions.
Employee satisfaction	The results of an employee satisfaction survey	Employees' full intellectual potential can be utilised only if there is the right motivation and psychological capital among the workforce. The overall employee satisfaction is measured with an internal survey. The respondents are requested to rate their satisfaction (on the scale 1-5) with: 1) their colleagues, 2) teaching assignments; 3) auxiliary services provided by the administrative staff; 4) direct superior; 5) IT infrastructure.
Student satisfaction	The results of an student satisfaction survey	The students are considered the main part of the relational (or market) capital. The results of the survey are presented in numerical form
The university's graduates	The photographs of prominent graduates	The most accurate and reliable measurement of the output of a university is the long-term success of its graduates.
Organisational structure	The organisational chart	The university is a complex structure employing in many cases several thousand qualified professionals. The bureaucratic
IC indicators	Divided between human and structural capital indicators present a concise	' <i>What gets measured gets done</i> '. A set of numerical indicators allows for comparisons in time and benchmarking against other universities.

As far as the strategic management is concerned, originally it was planned to develop a measurement tool similar to the Balanced Scorecard (BSC) measurement. The full implementation of the Balanced Scorecard at the university is a lengthy and complicated process. It is almost impossible to engage a community of several hundred researchers, each of them pursuing their own personal strategies, in the creation of strategic vision and goals for a university. Due to the low level of codification of strategic management knowledge at the University, a simpler diagnostic tool was developed. It is a self-evaluation chart with a list of thirteen strategic management areas (e.g. mission statement, ISO certification, business education background of the University's top management). Each criterion is self-evaluated on the four-point scale (0% implementation ... 100% implementation).

Potential threats and obstacles

The development of Intellectual Capital measurement processes can be severely hampered by "IC illiteracy." Traditionally the management of science was based on the tacit knowledge of senior academics that have spent a few decades working at the university. The codification of organisational knowledge

requires a change of attitude. It takes some skill to read and interpret an Intellectual Capital report. Maps and plans have been instrumental in the development of human civilisation. But it was those who could read such maps that could change the world. Similarly, Intellectual Capital reports are valueless for those who cannot construct and read them. If the progress of the Knowledge-based Economy is to continue, the 'Intellectual Capital literacy' among decision-makers in Europe must increase.

It has to be stated that due to historical, technical, cultural and procedural barriers not all of the important information can be grasped in the first IC report. Although the administrative staff is the main source of raw data, their understanding of the idea of intellectual capital management is very low. This creates problems with collecting the information in the proper format. Inadequate human resources databases may slow down the process of collecting and processing tracking the employment records of most of the researchers.

There are a number of cultural barriers to the measurement of intellectual capital at universities, such as:

- Uncompetitive remuneration. This creates incentives for seeking extra opportunities such as consulting and training activities outside the university. Even if the salaries of researchers are increased, the culture of seeking extra employment aside from the university will remain.
- Weak leadership. The rector is elected for a four-year tenure from within the research community. This reduces the likelihood of taking radical decisions.
- High societal status. A university professor may be discouraged him from 'trying harder,' as the threat of unemployment, which is usually an important motivating factor in the labour market, is practically non-existent in the scientific community at the university.
- The self replicating-organisational culture. Older generations of researchers tend to hire 'people like them'. Similarly, individuals who do not fit the old culture are unlikely to be hired.

When designing an IC measurement tool, one should be aware of the following potential challenges⁴:

- Complexity - too many metrics, excessive detail, or burdensome data capture - can make metrics too difficult to use,
- Metrics aimed at short-term performance often have unintended long-term consequences because employees tend to do well on what is measured rather than what is not,
- Know the difference between in-process and end-process metrics. In-process metrics are used to help understand what is working. End-process metrics measure process effectiveness. According to the Danish Ministry of Science, Technology and Innovation, indicators can measure effects (end-process), activities (in-processes) and resource mix⁵,
- Quantitative metrics often miss important subjective elements (i.e., qualitative factors),
- Cultural barriers - fear of measurement and new systems, lack of understanding,
- Lack of meaningful employee involvement,
- Lack of common definitions and terms,

⁴ See: B. Hack, *Designing Performance Measures and Metrics*, APQC 2003, www.apqc.org, *The New Guide to Intellectual Capital Statements*, The Danish Ministry of Science, Technology and Innovation, Copenhagen, February 2003, p. 13; H. Rohm, *Improve Public Sector Results with A Balanced Scorecard: Nine Steps to Success*, U.S. Foundation for Performance Measurement, 2002.

⁵ *The New Guide to Intellectual Capital Statements...*

- Visions and strategies that are poorly defined and understood, not actionable and not linked to individual actions,
- Identification of “social loafing”⁶ – many common IC indicators overlook this issue. For example the indicator *number of publications* can be easily skewed by this malpractice.

Final conclusions

Knowledge-based work is the dominant economic activity in the knowledge-based economy. Europe is facing demographic changes requiring a significant improvement in the productivity of Intellectual Capital. Facing the global market, European economies have no choice but to strengthen their intellectual potential in order to survive competition from the Asian economies. Clearly there are no panaceas and universal solutions for improving the performance of European Universities. Nevertheless, European universities must adopt management approaches and methods developed in the business sector.

The IC measurement should be thought of as a platform for discussion about intangible assets in the university. The content of IC report should therefore provoke questions – not just give all the answers. The authors of IC reports shun from leaving the room for ambiguity--inspired by the accuracy of financial statements they try to copy the structure of a balance sheet. Instead, IC reports should include a certain number of questions and scenarios, which the management will try to analyse. Competent managers do not know all the answers, but they excel at posing the right questions. Making the acquisition and application of IC 'discussible' improves prospects for informed decision making that can mobilise changes in the business agenda. Clearly, it is apparent that IC reporting models are still at an embryonic stage⁷.

It should not be assumed that universities that do not publish their IC reports are necessarily less advanced in the ways they manage their intellectual capital nor that organisations that do publish their IC reports, are generally more advanced. An IC report is an organisation's attempt to gather and structure certain bits of information - not a decisive proof as to whether it manages its intangible assets or not. Understanding a problem is not identical with being able to solve the problem. IC measurement should not be considered as an antidote for the uncertainty considering the efficiency in allocation of resources. IC measurement, despite all the difficulties, is not in vain. More knowledge is always better than less knowledge. Flying an aircraft with two engines (financial capital accounting and IC measurement) is always safer than flying with just one.

The measurement of Universities' performance is essential if higher-education system is to continuously regenerate itself by the intelligent use of knowledge management.

There is a need for more objective and reliable methods for measuring Intellectual capital of Universities in Europe and beyond. The introduction of such methods requires:

1. Building awareness among the senior academics occupying management positions at universities.
2. Creating an IC measurement task force.
3. Introduction of IC measurement methodologies.
4. Timely and complex implementation and publication of the results.

⁶ Social loafing refers to a decrease in individual performance when the individuals work in the presence of other persons. Social loafing implies that people work less hard in a group compared too working alone. There are various reasons for social loafing to occur, such as the lack of identification of individual contributions in a group effort, a difficult to establish relationship between input and output, and a minimum of evaluation potential. For more elaborate explanation of the concept of social loafing refer to: P. Vermeulen, J. Benders, *A Reverse Side of the team model*, Team Performance Management, Vol. 9, Number 5/6, 2003, pp.107-114.

⁷ P. Demediuk, R. Sims, V. Wise, N. Sciulli, *Measuring the Development and Application of Intellectual Capital in Local Government*, School of Accounting and Finance, Victoria University, Melbourne, Victoria, Australia 2003.

5. Engaging the scientific community into the process of evaluating their performance based on the IC measurement tool.

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