UNIVERSIDAD AUTÓNOMA DE MADRID

DEPARTAMENTO DE ORGANIZACIÓN DE EMPRESAS

PHD THESIS

GOVERNING THE UNIVERSITY OF THE 21ST CENTURY: INTELLECTUAL CAPITAL AS A TOOL FOR STRATEGIC MANAGEMENT

LESSONS FROM THE EUROPEAN EXPERIENCE

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Madrid, July 2007

A LA CONSTANCIA, A LA COHERENCIA, AL TRABAJO SERIO…, SIN DUDA, A MIS PADRES

ACKNOWLEDGEMENTS

Writing this PhD Thesis has been a very long process and one of the most challenging enterprises I have ever undertaken. During the last four years important things have changed in my life and finishing this Dissertation would have not been possible without the support and encouragement of many people and institutions to whom I am sincerely grateful.

My supervisor, M. Paloma Sánchez, has my most sincere gratitude for her continuing encouragement and guidance, for giving me the opportunity to start a research career and being a constant intellectual stimulus. Special thanks also to Aldo Geuna, my tutor at SPRU (Science and Technology Policy Research) where I was a visiting student during a short but very valuable stay. His ideas have always challenged me. I hope this work will, at least a bit, live up to their expectations.

I particularly acknowledge the support of the PRIME Network of Excellence. Thanks to its PRIME Circulation scheme I had the chance to spend few months at SPRU, where I significantly improved my research and, even more importantly, learnt a lot about myself. My experience there was truly special. I would like to express my gratitude to everybody working there. My special thanks to Nick Von Tulzemman for always being available and willing to share all his wisdom with me.

Most of the research for this PhD Thesis was carried out within the European Project entitled “Observatory of the European University” funded by VI Framework Programme of the European Commission. Thanks to all the researchers and participants for sharing their knowledge and experience with me. Particularly, thanks to Lukas Bashung and Gaëlle Goastelec from Lausanne University.

Many thanks as well to the Department of Business Administration of Pablo de Olavide University, particularly to Ramón Valle, for his support from the beginning of my teaching career and for making my stay abroad possible and the chance to work on my Dissertation without other teaching activities. Without doubt, this Thesis has been possible thanks to that opportunity.

Sincere thanks goes to the many people who kindly collaborated in the fieldwork of this PhD research in the Autonomous University of Madrid, Pablo de Olavide University, Lausanne University and SPRU (in Sussex University).

Moreover, I wish to express my gratitude to Otto Altenburger from the University of Vienna; Karl-Heinz Leitner and Andrea Kasztler from the Austrian Research Center; Cinzia Daraio from Aquameth Project; and Cristóbal Torres and Rocio Castrillo from the Autonomous University of Madrid for their helpful comments and suggestions.

My special gratitude to Sheila for her great effort to make this Dissertation readable in English.

Many and special thanks to all my friends in Brighton, Madrid and Seville whose friendship is extremely important to me. They all know how difficult it has been to complete this process: Basak, Katie, Ubi, Charo, Marta S., Marta C., Sabina, Elena, Ana, Joaquín and Ana Beatriz, thank you very much. Special thanks to Roberto for his faith in me and his total support.

Last but not least, I could not have found the strength to go ahead and complete this Thesis without the unconditional support of my parents, Jesús y Mª Jesús, and my sister, Raquel, whom I deeply thank for being there for me at all the moments when I so much needed them.

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LIST OF ABBREVIATIONS

AAAS: American Association for the Advancement of Science

AQA: Quality Assurance Agency

AQUAMETH: Advanced Quantitative Methods for the Evaluation of the Performance of the Public Sector Research

ARC: Austrian Research Center

CHEPS: Center for Higher Education Policy Studies

CHINC: Changes in University Incomes: Their Impact on University-Based Research and Innovation

CSIC: Consejo Superior de Investigaciones Científicas

EARMA: European Association of Research Managers and Administrators

ECTS: European Credit System

EHEA: European Higher Education Area

ENQA: European Network Quality Assurance

EPM: Extended Performance Management

ERA: European Research Area

ESMU: European Center for the Strategic Management of Universities

ESPIRIT: European Strategic Program for Research and Develop Information and Technology

ESRC: Economic and Social Research Council

ETRI: Electronics and Telecommunications Research Institute

EU: European Union

EUA: European University Association

EUREKA: European Research Coordinating Agency

EUROSTAT: Statistical Office of the European Communities

EZ: Ministry of Economic Affairs (The Netherlands)

FASB: Financial Accounting Standards Board

GDP: Gross Domestic Product

GT: Grounded Theory

HE: Higher Education

HEFCE: Higher Education Funding Council for England

HERD: Higher Education Research & Development

HERO: Intellectual Capital in Higher Education Institutions and Research Organisations

IAS: International Accounting Standard

IASC: International Accounting Standards Committee

IC: Intellectual Capital

ICR: Intellectual Capital Reports

ICT: Information and Communication Technologies

IMT: Innovation Management Technique

INGENIO: Instituto de la Gestión de la Innovación y del Conocimiento

IPR: Intellectual Property Right

LOU: Ley Orgánica de Universidades

MEC: Ministerio de Educación y Cultura

MERITUM: Measuring Intangibles to Understand and Improve Innovation Management

METI: (Japanese) Ministry of Economy, Trade and Industry

NICI: National Intellectual Capital Index

NPM: New Public Management

OECD: Organisation for Economic Co-operation and Development

OEU: Observatory of the European University

OTRI: Oficina de Transferencia de Resultados de Investigación

PDI: Personal Docente Investigador

PRIME: Policies for Research and Innovation in the Move towards the European Research Area

PRO: Public Research Organization

R&D: Research and Development

RAE: Research Assessment Exercise

RICARDIS: Reporting Intellectual Capital to Augment Research, Development and Innovation in Small and Medium-sized Enterprises

SME: Small and Medium-sized Enterprise

SPRU: Science and Technology Policy Research

SUC: Swiss University Conference

SWOT: Strengths, Weaknesses, Opportunities and Threats

TQM: Total Quality Management

TTI: Technology Transfer Institution

TTO: Technology Transfer Offices

UAM: Universidad Autónoma de Madrid

UK: United Kingdom

UNIL: University of Lausanne

UOA: University Organisation Act

UPO: Universidad Pablo de Olavide

UPV: Universidad del País Vasco

USA: United States of America

VLSI: Very Large Scale Integrated Circuit

"The aim of science is not to open the door to infinite wisdom, but to set a limit to infinite error"
Bertolt Brecht (1898-1956)

1. INTRODUCTION

1.1. Research Justification, Main Objectives and Research Questions

In the so-called *knowledge-based economy*, intangible assets and investments are seen as essential drivers in the value creation processes in companies and, hence, in economic wealth (Cañibano, García-Ayuso & Sánchez, 2000; Lev, 2000). To this effect, since the second half of the 20th century main economic and strategic management theories have recognised, to a greater or lesser degree, the existence of intangible elements that explain part of the economic growth (Solow, 1957; Shultz, 1961; Denison, 1962; Arrow, 1962; Kendrick, 1974; Becker, 1975; Nelson & Winter, 1982; Nonaka & Takeuchi, 1995; Gorey & Dobat, 1996; OECD, 1996; Freeman & Soete, 1997; European Commission, 2000a).

Given their importance in the new economic paradigm, intangibles and Intellectual Capital have become a major issue not only for academics but also for governments, regulators, enterprises, investors and other stakeholders during the last decade. The term `Intellectual Capital´ (IC), can be 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, 2006b; p. 4).

Although most of the knowledge management and IC analysis refers to private firms, the interest has extended from private organisations to public ones, such as universities and research centres. This latest concern is due to the fact that universities´ main goals are the production and diffusion of knowledge and their most important investments are in research and human resources. Despite the fact that their main inputs and outputs are basically intangibles, there are very limited instruments to measure and manage them (Cañibano & Sanchez, 2004). Proof of the mentioned concern about managing and reporting on intangibles in universities and research centers is the recent work done by the High-Level Expert Group set up by the European Commission. Accordingly, one of the most important policy recommendations included in the final document[1] is the need for both Commission and member states "to promote IC reporting by universities and research organizations" (European Commission, 2006b).

If a knowledge-based economy is mainly characterised by the production, transmission and dissemination of knowledge, universities are unique in all these processes. Hence, since the end of the last decade, they are considered critical institutional actors in the national innovation systems and are in the forefront of the European policy agenda. In this changing context, Higher Education (HE) institutions are immersed in crucial structural changes throughout the so-called "Bologna process" and the creation of the European Higher Education Area (EHEA). Furthermore, new financial and social pressures have led to a number of significant changes and the following are cited in the specialised literature as the most significant: new methods for measuring university performance and efficiency, the creation of accreditation agencies across Europe, the institutionalization of new funding mechanisms, reforms of national legislations to increase the level of university autonomy, and the introduction of managerial tools to improve their internal management.

The analysis of European HE sector confronts a lot of difficulties given the high degree of heterogeneity of universities across Europe (and even within national boundaries), and due to the problems inherent to the study of public institutions. Even so, we

[1] RICARDIS: Reporting Intellectual Capital to Augment Research, Development and Innovation in SMEs.

consider it crucial to analyse these organisations due to their historic importance and relevance today. Moreover, economic and management literature has been traditionally focused on profit-making organisations and less attention has been paid to universities. Finally, as part of the academic community we are especially motivated to understand our universities better, and our aim is to shed light on ways to improve their internal management.

Therefore, taking into account the aforementioned scenario, the **purpose of this PhD Thesis is twofold**. On one hand, and due to the changing environment in which contemporary HE institutions are immersed, **to analyse which elements principally characterise the governing styles** of these institutions and, on the other hand, to study the **implications of using IC approaches in public European HE institutions**. It is worth noting that given the complexity of the HE institutions, this PhD research has been mainly **focused on research activity**.

Accordingly, our **main hypotheses** are:

- The university governing style influences its strategic management and behaviour.
- The success of HE sector reforms, at both national and European levels, are determined by the university governance structures.
- IC models provide an answer to the requirements for new management and transparency in public European Universities.

In short we can define the "thesis of the thesis" as the following: **contemporary universities should introduce new managerial approaches to successfully deal with the challenges of the new scenario and IC approaches would seem to provide a suitable framework. However, introducing IC models is not enough. There need to be significant underlying transformations in traditional university governing styles and structures to avoid purely "cosmetic" changes.**

This main goal could be disaggregated into more **specific research questions**:

- What do we understand by managerial and entrepreneurial universities? Do both concepts overlap? Is the European HE sector really immersed in a `managerial revolution´?

- What are the main aspects that define the governing mode of European universities? Can we identify a *European model*?

- Assuming that firm-level experiences could be useful in formulating public management models: What is the rationale behind recommending universities to identify, manage and disclose their IC?; Are IC approaches useful in understanding and improving the internal management process within universities? Is the IC framework relevant in HE institutions? What are the main benefits and shortcomings of applying it to HE institutions?

In order to answer these research enquiries, from the theoretical perspective, an in-depth and systematic review and analysis of the main specialized literature in the fields of economics, management, IC and intangibles, and higher education will be presented to provide the current PhD Thesis with a robust theoretical framework.

From the empirical point of view, the main research method chosen is mostly qualitative, based on multiple cases study analysis under the logic of the Grounded Theory (GT). Summing up, as social researchers we are addressing a phenomenon that we have considered socially significant, linking our work to theory, using large amounts of purposefully collected evidence and, analysing it systematically to assure rigour.

Finally, note that our active participation within the PRIME (Policies for Research and Innovation in the Move towards the European Research Area) Network of Excellence - and particularly in the European Project “The Observatory of the European University”, (funded by the VI Framework Programme) - has provided us with access to different university experiences across Europe and a very interesting starting point for this PhD Dissertation.

1.2. Thesis Overview

This PhD Thesis, after the introduction that sets out the rationale of the research and its main objectives and research questions, is developed is **three parts**.

The **first part** contextualises the PhD research and provides the basis to understand its academic relevance.

In the first chapter, the importance of intangibles assets and investments is analysed from a macro-economic point of view, providing some indicators and evidence of their growing importance in OECD economies. The necessity to improve the current indicators in order to better understand the new knowledge paradigm is addressed and the main policy initiatives to identify, measure and report on intangibles are highlighted. Accordingly, we define what it is understood by `knowledge-based economy´ as well as the terms `intangibles´ and `intellectual capital´.

Under the umbrella of the New Public Management (NPM) principles and the general reform of the public sector across Europe, the second chapter analyses the concepts of strategic management and transparency for public organisations and reviews the most outstanding experiences and initiatives in public organisations for measuring and reporting on IC.

The **second part** deals with the main unit of analysis: HE institutions. Although the specialized literature in the field considers universities and research centers key elements within the national innovation systems and recommends them to play an active role as knowledge producers, there is a lack of consensus about how these organisations should adapt to the new scenario. What is, or should be, their role in society, how they should be managed, or to what extent university-industry relationships might to be encouraged, have opened an intense debate. To this effect, questions mainly related to governance, funding mechanisms or assessment procedures are at the heart of the discussion.

New controversial concepts such as `managerial universities´ and `entrepreneurial universities´ have appeared. Regarding the novelty of these notions and the lack of any strict definition of them in specialised literature, the central purpose of the chapter 4 is to define them and to analyse their impact on academic knowledge.

Within the paradigm of *new managerialism*, in chapter 5 we examine the rationale of implementing the IC framework in HE and research organisations. As argued, it is a fact that 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 such as the OECD, the European Union or the World Bank are showing an explicit interest in this issue organising working groups, international conferences, etc.

Accordingly, Intellectual Capital Reports (ICRs) are presented as a tool for visualizing organisations´ inputs, outputs and processes comprehensively. At European level, Austrian university reform is a paradigmatic example towards managerial ideas. Accordingly, changes that occurred in the Austrian tertiary sector during the 90s are described. Finally, and based on the analysis of these experiences, we outline the benefits and obstacles of implementing IC frameworks in these particular organisations, and reflect on the dichotomy mandatory versus voluntary basis, and on the trade-off between standardization and context-specific indicators.

In line with the idea that "the nature and scale of the challenges linked to the future of the universities mean that these issues have to be addressed at European level" (European Commission, 2003a; p.10), the final chapter of this second part presents two of the most recent and outstanding projects dealing with HE institutions. On one hand, the AQUAMETH project aimed to integrate a battery of indicators, using secondary sources of information, in a joint data base to allow benchmarking analysis at national level. On the other hand, the Observatory of the European University (OEU) project which was created using a bottom-up approach to understand better European universities and to improve university strategic management. Both initiatives - their goals, outputs and methodological shortcomings - are described. Furthermore, although both projects deal with different objectives, we highlight that both initiatives are highly complementary.

Finally, the **third part** is devoted to explaining the empirical analysis and its results and lessons. Chapter 7 discusses the main methodological approach. As mentioned before, multiple case study analysis under the logic of the Grounded Theory is the qualitative method used in this PhD research.

From our point of view, the logics that underpin case studies inquiry and the GT approach are highly compatible and have several aspects in common. On one hand, it can be said that both hold that from the analysis of empirical evidence the researcher can build a valid theoretical framework. On the other hand, both models rely on continuous comparison of data. The constant comparative model described by Glaser & Strauss (1967) and the replicate logic for multiple cases (Yin, 1994) aim at providing systematic procedures that assure the rigor of the emergent theory. This chapter justifies the methodology in detail and explains the research design, stressing the rationale of the unit of analysis, the case studies selection, the data collection and the data analysis process.

As mentioned, by working on these four case studies we have pinpointed the key variables that define the governing mode in HE institutions and the relationships among them.

The chapter 8 begins by defining the term “governance” and its implications in HE institutions. Afterwards, we highlight the strategic documents analysed, a characterisation of each case study, and the main concepts and categories that have emerged. Finally, the results on the implications of university governance modes for the implementation of IC approaches are presented.

In the last chapter, the final discussion, conclusions and further research lines are highlighted.

PART I

THE RELEVANCE OF INTANGIBLES IN THE KNOWLEDGE-BASED ECONOMY

"Not everything that can be counted counts, not everything that counts can be counted"
Albert Einstein (1879-1955) (attributed)

2. THE RELEVANCE OF INTANGIBLES IN THE NEW SOCIOECONOMIC PARADIGM: NEW WAYS OF MEASURING AND MANAGING

At present we are immersed in the so-called Knowledge Economy, which is understood to be an economy based directly on the production, distribution and use of knowledge and information (OECD, 1996). Nevertheless, knowledge cannot be considered a novel element in social-economic development, as it was already under study and being given thought in ancient Greece. Accordingly, the OECD (1996) recognises that knowledge has always been important for economic development and, as Davenport & Prusak (1998) also affirm, before ideas and theories such as "core competences" or "the learning organization" even appeared, good business managers valued the experience and know-how of their employees; which is to say, their knowledge. In fact the importance of knowledge as a factor in economic and social transformation was first highlighted at the end of the 19th century by the English economist Alfred Marshall, and, in the first half of the 20th century, by the authors of the Business Theory like Knight (1921) and Hayek (1945)[2]. Taking up the question posed by Davenport and Prusak at the end of the 90s – Why this new emphasis on the old question of knowledge which concerned Plato and Aristotle?

The basic difference with respect to the previous conceptions most assuredly lies in the fact that the importance of knowledge in business management was only truly recognised a few decades ago, fundamentally at the beginning of the 90s. This is to

[2] For more information about the concept of “knowledge” in economic theories, see Bueno & Salmador (2000).

say that what really differentiates them is the importance, role and significance that knowledge has in society as a whole (Bueno, 1999). In short, the term Knowledge-based Economy is the result of a greater recognition of the role that knowledge and technology play in economic growth (OECD, 1996).

Within this new paradigm, intangible elements are growing in importance in detriment to the classic production factors, such as machinery, land, or labour that have been unquestioned in advanced economies up to now. Such is the case that it has even been claimed that the creation of wealth is more closely linked to intangible assets rather than tangible ones. At European level, knowledge is explicitly recognised as a crucial ingredient of the innovation process and the Lisbon Agenda (Lisbon European Council, 2000) set up the objective to be the most competitive and dynamic Knowledge-based Economy in the world.

In a dynamic environment, intangibles like skills and human resources training, corporative image, organisational structure or relations with customers and suppliers, are being converted into important sources of sustainable competitive advantage and the creation of added value. Paradoxically, these crucial elements for business success are not included in company financial statements and, on many occasions, cannot even be identified, measured or managed correctly by any existing method. Traditional measurement tools have been incapable of including these new elements or offering convincing explanations on phenomena such as growth, productivity and employment. This is to say that measurement has become a strategic need today. For this reason, it is crucial to construct new measuring systems and indicators which capture the whole picture.

This problem also has repercussions at a micro-economic level. In consequence, notable efforts are being made both in academia and business to come up with a model of that enables companies to include intangibles in their internal management systems and in the ways they diffuse information.

The aim of this chapter is to justify and look more closely into the importance of the intangible elements in economic development and business success in the so-called Economy of Knowledge.

With this object in mind, the chapter is structured as follows: the first section, starting with the definition and typologies of knowledge, sets out the elements that define this new economy. There is a brief glance at economic and organisation theories and also business administration which, from the middle of the 20th century has considered knowledge an essential factor in growth and economic development and a source of essential competitive advantage. Besides this, the relevance of establishing new ways of measuring this new reality at both a micro and macro-economic level is stressed and there are examples of some of the most relevant indicators used in OECD (Organisation for Economic Co-operation and Development) countries which underline the importance of intangibles in the growth of industrialised countries. Given the numerous definitions and taxonomies of intangibles and Intellectual Capital (IC) that we have found in the specialised literature, section 2.2 sets out the most familiar definitions and classifications in business practice and on the political agenda, so as to clarify which will be used in this Doctoral Thesis. Section 2.3 looks at how intangibles are dealt with on the political agenda and section 4 on the need to introduce measuring models and intangibles management in the business world. The best known contributions, at both a national and international level, from the end of the last century are presented. Finally, in the last epigraph, the chapter conclusions are presented.

2.1. The Knowledge Society: A new socioeconomic paradigm

2.1.1. What do we understand by knowledge?

Before starting to talk about a Society based on Knowledge and the elements that characterise it, it is best to define what is understood by the term ‘knowledge’. So in this epigraph the concept will be defined and the most highly developed and commonly accepted typologies will be set out briefly.

According to Polanyi (1966) two types of knowledge can be distinguished:

- Explicit knowledge, by which is understood a codified knowledge, systematic and transferable through formal language.
- Tacit knowledge, i.e. personal knowledge, implicit, difficult to formalise and measure and, thus, to communicate.

For his part, Lundvall when analysing knowledge establishes a distinction in 4 categories (in OECD; 1996):

- `Know what´ refers to facts. Knowledge gathered in this category is nearer to the concept of information.
- `Know why´ refers to scientific knowledge of the principles and laws of nature. The production and reproduction of this kind of knowledge is often centred in specialised organisations, like research laboratories and universities. To have access to this, companies need interaction with these organisations, either through recruiting qualified staff or through contacts and joint ventures/activities.
- `Know-how´. This category includes skills and the capacity to do something. One of the most important reasons for setting up industrial networks is the need to share and combine elements of know-how.
- `Know-who´. This type of knowledge is getting more and more important. It refers to information on who knows what and who knows how to do it. It deals with the internal knowledge of an organisation at a greater level than any of the previous categories. Modern business managers consider it is vital to employ this kind of knowledge as an answer to accelerating change.

The first two points alluded to in this classification can supposedly be obtained easily through reading books, attending seminars and conferences, going into databases, etc., while the other two categories are more closely linked to practical experience and form part of tacit knowledge. As deduced from these definitions, the concept of knowledge is much broader than that of information which is basically restricted to the categories of know-what and why. Accordingly, as the OECD (1996) states, the development of information technologies can be considered an answer to the need for organisations to make use of the employees´ "know what" and "know why" more efficiently. Nevertheless, it should be kept in mind that the incorporation of these technologies makes it necessary for the organisations to develop internally or acquire in the market all the skills or type of specific knowledge to make good use of them. This new economy is characterised by the need for continuous learning as much in codified information as in the competence necessary to be able to use and manage this information. These skills have become crucial owing to the fact that accessing information is ever easier and cheaper.

For this reason, in spite of the fact that the economy of knowledge is visibly affected by the information society they cannot be considered synonymous. This is to say that although the developed technologies – Internet, Intranet, Lotus Note, etc. – are among

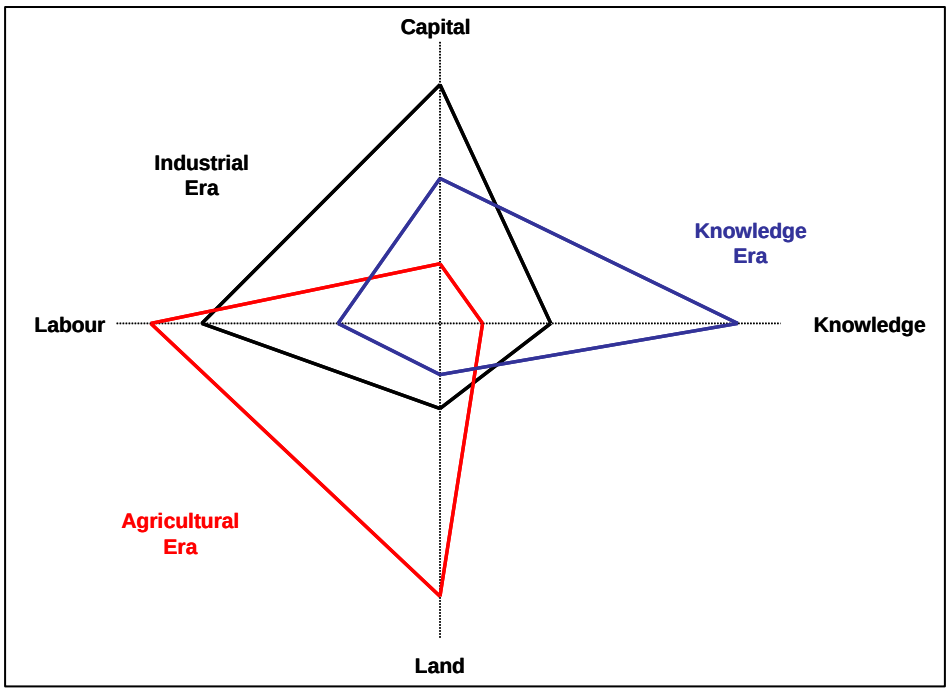
the positive factors that have increased and fomented interest in knowledge and its management (Davenport & Prusak, 1998), and the existence of information technologies and infrastructure for communications have given strong impetus to the process of codification of certain kinds of knowledge, the two concepts should not be confused.

2.1.2. Knowledge as a Productive Factor and Source of Competitive Advantage

There is general consensus in the specialised literature on the idea that we are facing a new socioeconomic paradigm, in which knowledge has become one of the determining productive factors, leaving aside traditional production factors: land, labour and capital. With the aim of explaining this new-found importance given not only to knowledge, but also to other elements of an intangible character, such as dynamic competences or organisational learning, in growth and economic development as well as in business organisation and strategic management, we present a brief historical overview following of the main theoretical contributions from the second half of the last century.

The graph in figure 2.1 shows the evolution that the four main economic factors have gone through. In an agricultural economy, the most important economic resources were land and work; in the Industrial Era, the work factor continued to have great relevance and the importance of capital increased in detriment to the land factor. Finally, in the present Knowledge Era, we are seeing a radical change in the predominance of traditional productive factors which have given way to the new role of knowledge. From the beginning of the 21st century it can even be affirmed that knowledge is the motor of this new economy (European Commission, 2000a).

Figure 2.1. Evolution of Economic Factors



Source: Gorey & Dobat (1996; in Bueno & Salmador, 2000)

In short, we can say that the modern economy is characterised by three new elements that make it radically different from previous stages (European Commission, 2000a):

1) The rhythm at which the structural changes appear to have increased in the last three decades, which implies the need to find answers and adapt more quickly.
2) Changes occur simultaneously, and
3) The idea that knowledge seems to explain a greater rate of growth than in the past.

From a theoretical point of view, economic thought in the first half of the 20th century is characterised by, among others, the belief that accumulating physical capital was the basic factor that affected micro and macroeconomic growth. However, from the 60s onwards diverse theories and approaches began to study knowledge as the differentiating element in the economy in general and in business development in particular.

In 1957, Solow's publication "Technical Change and the Aggregate Production Function" (1957) marks a fundamental highpoint in the importance given to production factors in relation to growth. In this work, the author, through a function of Cobb-

Douglas type production, developed a model with the intention of evaluating the relative weight of each production factor in the economic growth of a particular sector of the US economy. One of the problems that Solow had to face was that, according to his model, economic growth tended to come to a halt in the long term. The data revealed that the production per worker had increased much more than the traditional economic assumptions could explain. In this way, what was known as Solow's "residue" appeared in economic literature and is, in fact, no more than the "unexplained" component of growth. The author dealt with this residue, which he called progress or technical change, as an exogenous variable in his model. As Solow, himself, acknowledged in 1987, the year in which he was awarded the Nobel Prize for Economy: "the results of this experiment were surprising (…). Gross production per hour of work in the US economy duplicated in the period 1909–1949, and about seven-eighths of this increase could be attributed to technical progress in its broadest sense and only the remaining eighth could be attributed to a conventional increase in capital intensity" (Solow, 1988; p.310).

Solow's results gave cause for innumerable studies in the field of growth accounting and one of the most influential and detailed attempts to untangle the respective contributions of production factors was produced by Denison (1962). In quite complex model, the author managed to disaggregate the factors that intervened in growth with the following results:

- 25% - Increase in the work factor with a constant educational level.
- 16% - Increase in educational qualifications of the average worker.
- 12% - Growth of capital factor (K)
- 11% - Improvements in the assignation of resources
- 11% - Scale economies
- 34% - Growth of "knowledge" or technical progress in a limited sense.
- 9% - Various factors reducing production growth.

These results not only confirmed Solow's findings, but also the importance of the "knowledge" factor (34%) and "work" factor (25%).

Later, in the last quarter of the 20th century, Economic Theory has stressed the relevance of one of the essential factors to understand economic development: human resources. Human capital analysis began with the revision of the term 'capital' made by Shultz at the beginning of the 60s. This author was the first to establish the fact that an

individual's skills and knowledge were a form of capital. He claimed that growth in human capital in Western societies is the result of deliberate investment and one of the main reasons for economic growth (Schultz, 1961). Later on, Gary Becker (1975) considerably developed the Theory of Human Capital, which is defined as the productive skills which a person acquires through an accumulation of knowledge, whether general or specific, formal or informal. As Mincer (1989) states, human capital plays a dual role in the process of economic development: as skills stock, generated thanks to education, and as knowledge stock, which accumulated is a source of innovation. In line with this thinking, investment in human capital will have positive effects not only on economic growth but also on variables such as incomes and employment (Becker[3], 1975 and 1993; Mincer, 1974).

Nevertheless, it is not until the 80s and 90s that knowledge is widely recognised as the crucial element in economic development. From the neo-classic economic point of view, the Theories of Endogenous Growth (Romer, 1986; Lucas, 1988) consider that growth in an endogenous process to the economic system, and technological change take place as the economic agents' answer to price changes.

In an attempt to go a further step in the explanation of economic development from a perspective which differs from the neoclassic theories-type, the recent Evolutionary Theories of Innovation and Technological Change do not stop at explaining growth but extend their interest to the processes of change, innovation and technological progress (Dosi, 1982; Freeman & Soete, 1997; Clement, Hammerer & Schwarz, 1998). These theories establish that scientific and technological activity is not an exogenous factor, but rather one introduced into the model as an explanatory endogenous variable of economic growth. In Freeman and Soete's[4] words (1997; p.16) "innovation is crucial, not only for those who want to accelerate or sustain the growth ratio of a country, but also for those who are concerned about the amount of goods and wish to change the direction of economic advance or concentrate on improving the quality of life". Without doubt, the literature, both theoretical and empirical, on technological change has supposed an important contribution to the concept of intangible investment[5].

[3] Nobel Price in Economic Science in 1992.
[4] Most important representative of the Evolutionary Theories with Nelson y Winter (1982), Dosi (1982) and Pavitt (1984).
[5] Intangible investment can be defined as those activities that can generate new intangible resources for the organisation or maintain the existing ones. A more detailed definition will be given in section 2.2. of this PhD Thesis.

On the other hand, from the second half of the 20th century, the Theories of Business Organisation and Strategic Management, have begun to show a growing interest in knowledge and other intangibles in the evaluation of success in organisations, focusing on aspects like skills and competence, tacit knowledge, quality management, marketing, organisational learning, or human resources training. As commented earlier, up to the 80s, knowledge was considered practically a commodity, on a par with the concept of information, and, in the same way, freely available to all organisations, generic and easily adaptable to the particular needs of each company (Sánchez et al., 2000). Today, in contrast, knowledge is seen as the key differentiating element and source of competitive advantage for firms as well.

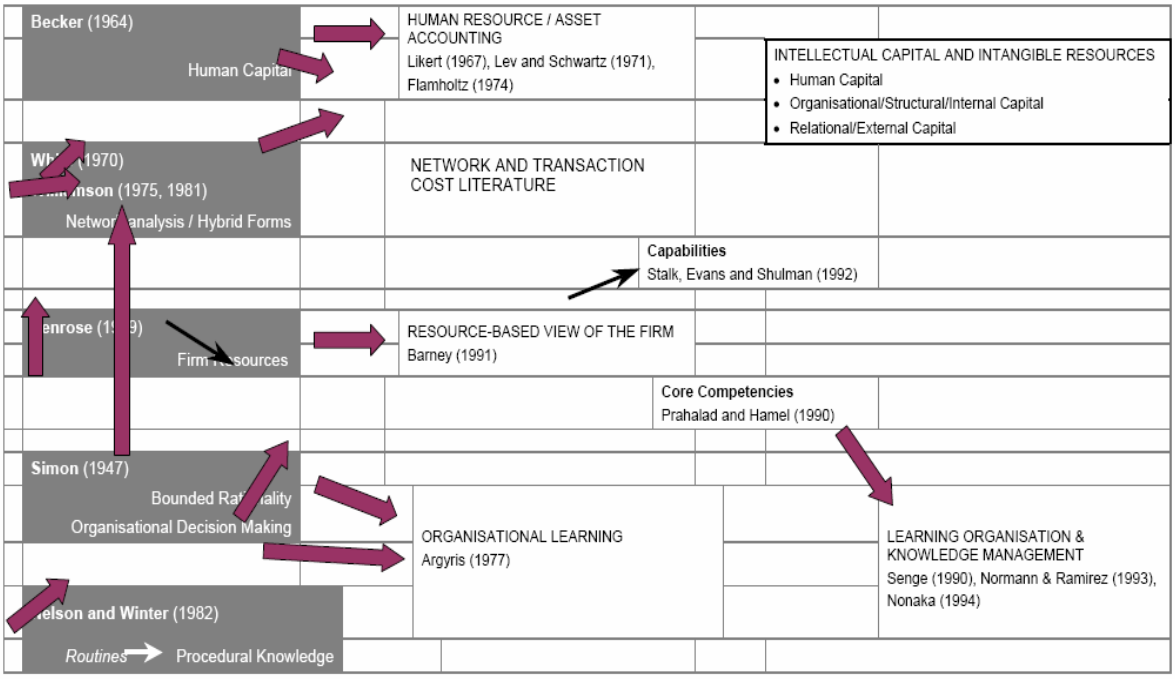
As a consequence of these changes, a school of thought was born called 'Vision based on Knowledge' (Conner & Prahalad, 1996; Demsetz, 1988; Orlikowski, 2002; Grant, 1996; Grant & Baden-Fuller, 1995; Kogut & Zander, 1992, 1993 and 1996; and Tsoukas, 1996). This approach draws on distinct sources, concepts and ideas from various disciplines (Grant and Baden-Fuller, 1995). Just as Sousa (2007)[6] states, this Vision mainly inherits its basic fundaments from literature on Resources and Capacities (Wernerfelt, 1984; Barney, 1991; Conner, 1991) and Evolutionary Economy (Nelson & Winter, 1982). From the point of view of the Theory of Resources and Capacities, this approach considers knowledge as a key strategic resource to maintain the competitive advantage of organisations. In the Evolutionary Economy, the company is conceived as a social community that presents advantages over the market as regards its capacity to create and transfer knowledge (Nelson & Winter, 1982; Kogut y Zander, 1992, 1996; Zander y Kogut, 1995). Under this evolutionary perspective, knowledge possessed by a company at a particular moment is consequence of past events and learning experiences, which, at the same time, determine the opportunities for future learning (Nelson & Winter, 1982; Kogut & Zander, 1992; Zander & Kogut, 1995, Teece, Pisano & Schuen, 1997).

As explained, numerous theoretical contributions serve as roots for the current debate about intangibles. Based on the research made by the University of Melbourne, university of Ferrara and the Stern Business School of New York University, the next

[6] For more details about the central aspects of this Vision, see Sousa (2007; pp.11-41).

figure summarises the main theoretical endeavours to explain the role of intangibles from the 60s to the 80s.

Figure 2.2. Theoretical Roots of the Current Debate on Intangibles and IC[7]



Source: European Commission (2003b; p.155)

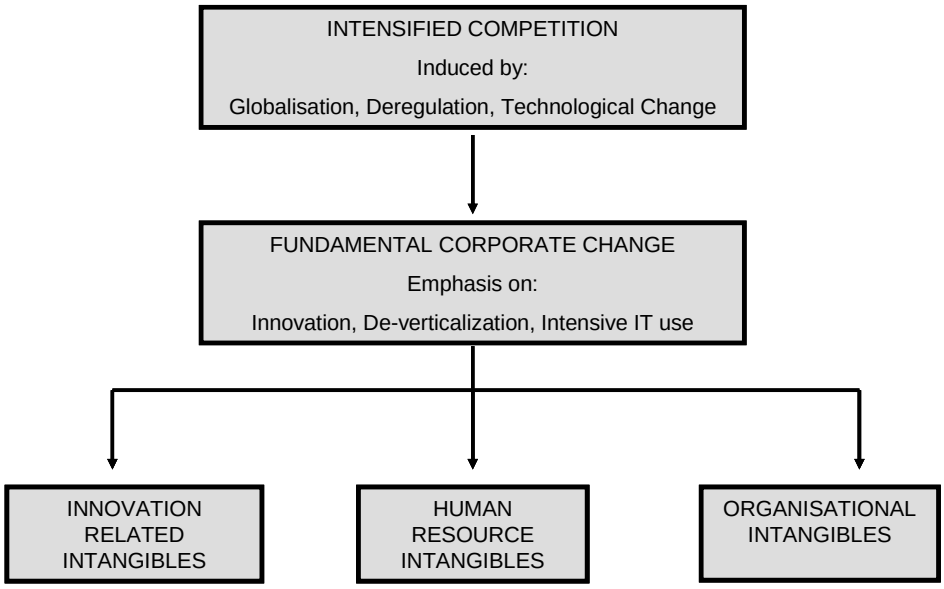
And so, as discussed, from the second half of the 20th century, the main economic, organisation and business management theories recognise, in one way or another, the existence of elements of an intangible nature, at variance with traditional factors, which explain to a great extent economic growth and business success. This is to say that the existence of intangibles, understood intuitively as being those factors that without physical substance or material, generate or can generate added value and economic growth. Within this broad concept we find questions such as research and development, manpower training, software, marketing, learning capacities, technical experience or organisational structure.

Intangibles do not, therefore, constitute a radically new phenomenon. What has recently given them so much relevance is the combination of two forces, one socioeconomic and the other technological (Lev, 2000). On one hand, the increase in competition in the business world as a consequence of the simultaneous processes of

[7] For an in-depth review of the theories dealing with intangibles and IC, see European Commission (2003b), chapter 5, section 5.1 (pp. 153-157).

globalisation and liberalisation of key economic sectors (transport, electricity, telecommunications, etc.) and, on the other, the development of information technologies and communication which have facilitated tremendous changes in the structure and function of organisations (see the following figure).

Figure 2.3. Ascendance of Intangibles



Source: Lev (2000)

As Lev (2000) affirms, owing to the pressure that firms are under as a consequence of these changes in the environment, from midway through the 80s organisations began an integral rethinking of their way to do business. The companies structured as in the Industrial Era and intensive in physical assets had been designed to work in scale economies. However, this kind of organisation and way of working no longer gives sustainable competitive advantage. For this reason, de-verticalization and innovation are converted into vital elements for the recognition of intangibles as sources of added value. With respect to the former, it substitutes the traditional scale economy, since present earnings are not only linked to production but derive ever more from relations with suppliers, customers, and even, competitors. Innovation, for its part, gains importance through the urgency and need that firms have for R&D, personnel training, and acquiring technology as a vehicle to sustain competitive advantage over time.

2.1.3. The Problems Associated with Measuring

As commented in the previous sections, knowledge is one of the major sources of competitive advantage. Given the new context, the question related to measuring has turned into a key element in order to understand the new socioeconomic paradigm and also to articulate state policies and define business strategies correctly. As the OECD (1996; p.43) states "our understanding of what is happening in the economy is constrained by the extension and quality of the indicators we have at our disposal". The same source, however, stresses that the traditional national accounts no longer offer convincing explanations of the trends in economic growth, productivity and employment.

Thus, there would appear to be an urgent need for information and data that give a better understanding and management of intangibles and IC. Such a need refers to both the stock of intangibles and also to the strategies and activities that the organisations are developing to improve those assets (Foray, 2004).

As argued in a study on the development of an infrastructure for measuring and reporting on intangible assets "paradoxically, an economic system based increasingly on intangibles may be stronger in the long term, since the exploitation of intangible assets allows more sustainable value creation than a system based on tangible assets. However, the problems associated with the measurement and evaluation of intangible assets imply that the system is more unstable, volatile, and vulnerable" (European Commission, 2003b; p.19).

From the Second World War indicators such as the GDP and national accounts were articulated like standard economic indicators for measuring in aggregated figures phenomena like production, consumption, investment or employment. These economic indexes shed light on how a system behaved and worked and have served, and still serve, as a guide for all agents in the system when political, social and economic decisions are being made. Nevertheless, it should be stressed that these classic measurements have never been particularly useful when it comes to explaining or predicting a nation's economic development, among other reasons, because they have neither been able to go further than show the added value of goods and services nor include determined variables which are also representative of the social and economic

reality. Given the dissatisfaction caused by the explanations provided by the Neo-classic Theories of Growth and by the GDP as the supposedly one reliable indicator of social welfare, certain economists and inter-governmental institutions (such as Amartya Sen, Ajit Dasgupta, and the United Nations Programme for Development) have tried to find indicators that can better reflect the enormous complexity that characterises the social reality. Accordingly, there have been diverse contributions, among which the following should be highlighted. (1) the inclusion of adjustments for measuring the existing GDP, as, for instance, introducing environmental variables, known as the Green GDP, (2) the substitution of the GDP by another indicator designed entirely differently, (3) the use of satellite accounting, or (4) the development of the denominated "social indicators", such as the Human Development Index or the Human Poverty Index, which complement the traditional GDP.

All the above illustrates the lacunas which hinder understanding of how the cogs turn in this new economy, and which present an unsettling challenge for present and future research. Further research must be devoted to the design of indicators and reliable measuring instruments in accordance with this new socioeconomic paradigm, not only in business but also at a macro-economic level.

If, as we have stated, the present economy differs in the way it works from the previous one, the traditional indicators could fail to capture basic aspects, and because of this, lead to erroneous economic policies (OECD, 1996). Added to this, it should also be noted that periodic surveys on innovation carried out in OECD countries do not sufficiently reflect the new situation as they do not include in the analysis, the essential intangibles variables which would explain the new processes of value creation (Sánchez et al., 1999). Because of this, it is necessary to design new measuring instruments. However, by their very nature, intangibles are extremely difficult to measure, and it is rather more complicated to obtain comparable indicators for them than for tangibles (OECD, 1999a and 1999b). Furthermore, there are severe obstacles when measuring knowledge, especially in reference to quantifying and the assignation of prices. On the one hand, because a large part of this knowledge is implicit, i.e., it is decoded and resides in the individual's mind, and, on the other, because we are ignorant of the terms and magnitude of the relationship between knowledge creation and its diffusion, and economic growth. In spite of the fact that supra-national organisations like the OECD recognise knowledge as the main intangible ingredient in

the economy, it should be stressed that there is no empirical proof of this as yet. Using the same argument, Lev (2000) affirms that, although it is generally accepted that intangibles create added value, the cause-and-effect chain has not been quantified. It must, therefore, be considered a working hypothesis.

The OECD (1996) states that as knowledge is not a traditional economic input, like raw materials or work, its inclusion in tradition national accounts is somewhat problematic as it would change the actual way of calculating these indicators. Because of all this, The OECD gives four reasons why knowledge indicators cannot fulfil the role of classic indicators:

- There is no stable formula or "recipe" that can translate knowledge creation inputs into a knowledge output.
- Knowledge creation inputs are difficult to establish because there are no knowledge accounts analogous to traditional national accounts.
- Knowledge has no systematic pricing system which could be used as a base.
- Lastly, the obsolescence of units of knowledge stock is not documented.

The problem with developing new indicators is in itself an element that highlights the unique character of an economy based on Knowledge. To fully understand its function new concepts and measurements are required which go further than conventional market transactions. According to the OECD it is, therefore, necessary to improve the indicators for the economy based on knowledge to develop the following tasks:

- **Measuring knowledge inputs**. Traditionally, R&D spending indicators and those that make reference to research and technical personnel have been the best sources of information when attempting to measure knowledge inputs. However, only a small fraction of all these inputs to the creation of knowledge can be attributed to these. Accordingly, the OECD points out that "a successful R&D policy stems from ideas that come from diverse sources, including informal professional exchanges and users' experiences and suggestions" (OECD, 1996; p.32). In this way, the improvement in the data-gathering process is fundamental when recognising the relative importance of the diverse knowledge inputs.

- **Measuring the stocks and knowledge flows**. As the measurement and evaluation of any stock carries with it the inclusion of a depreciation factor over the course of time, it is very difficult to apply amortization criteria on knowledge

indicators. In relation to this problem, the possibility of accumulating annual R&D inputs has been suggested for various countries and industries and to amortize them using approximate depreciation rates.

On the other hand, the measurement of flows or "the proportion of knowledge stock that comes into the economy in a given period of time" (OECD, 1996; p.33) turns out to be even more complicated. The proxy variables most used to measure knowledge flows are: 1) "embodied diffusion", which refers to machinery, equipment and components incorporating new technologies being introduced into production processes and 2) "disembodied diffusion", referring to the transmission of knowledge, technical skills or technology in the form of patents, licences or "know-how".

- **Measuring knowledge outputs**. Comparing knowledge inputs and outputs gives an idea of the relative positions of the diverse sectors and countries in terms of their R&D intensity. In this way, the OECD classification orders sectors and industries according to their relative expenditure on R&D or their R&D intensity. Nevertheless, this kind of indicators is mainly used in the manufacturing sector and has not been developed for the services sector, which means greater efforts are needed in this direction.

  Calculating innovation costs and profits to evaluate the social or private rates of return is another methodology that is used to measure knowledge outputs. This kind of indicator gives, along with others, an idea of the net profits for innovation efforts in industries and countries and is now being built at company level.

- **Measuring knowledge networks**. The distribution of knowledge among actors, as well as the formal and informal channels by which this is transferred, is fundamental in understanding the innovation process and knowledge creation. The development of indicators capable of measuring these networks is based, at present, on the National System of Innovation, which attempts to give a vision of "the skill of countries and systems to distribute knowledge among the various actors and institutions" (OECD, 1996; p.39), based on innovation surveys. From these, work is being started on maps of national systems of innovation and the capacity to distribute knowledge of economies through the analysis of two important flows: 1)

the distribution of knowledge among universities, public research institutions and industries and, 2) the distribution of knowledge within the market between suppliers and users (Smith, 1995; in OECD, 1996).

- **Measuring learning and knowledge**. The development of indicators that measure the relationship between learning and knowledge is of enormous importance for both countries and companies. The most common approximations to these indicators are based on the evaluation of social or private rates of return; i.e. the measurement of the impact that spending on education in society and business training has on economic growth or on company results respectively.

In short, the new indicators need to capture the process of innovation and knowledge distribution among the actors and key institutions in the economy. This means making changes in the National Systems of Innovation, in a way that the skills of countries and the systems to distribute knowledge are included. The central role that learning has in this new economic paradigm underlines the need to develop new indicators of human capital, training and manpower requirements (OECD, 1996).

In the same way, from the macro-economic point of view, the organisations, whether profit or non-profit making, need new systems of identification and management which visualise the critical intangible elements for the maintenance of their competitive advantage. For this reason, from the end of the 90s we have been witnessing a spectacular increase in models of intangibles management, not only in private firms, but also in the public sector. In the following chapters, we will be looking into the importance of identifying, measuring, managing and diffusing information on intangibles at a micro-economic level, giving special emphasis to public institutions.

2.1.4. Some Relevant Indicators

In spite of the problems associated with measuring which were highlighted in the previous section, the OECD uses some indicators which enable the analysis of this change of paradigm from the macro-economic point of view. However, it is important to stress that some of these indicators are still defined using classic parameters such as GDP, which, to some extent, is perpetuating the problem.

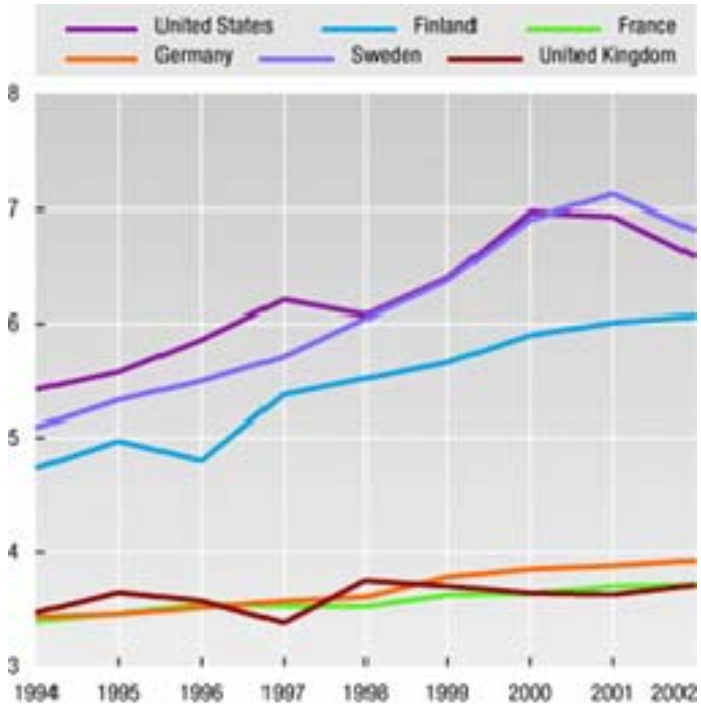
Regardless, the OECD states that industrialised countries are relying more and more on the production, distribution and use of knowledge. According to facts published by the OECD (1996), it is estimated that more than 50% of the GDP of the largest economies in the OECD are based on knowledge. It should be emphasised that, on one hand, investments directly related to products and services of high technology, especially with information and communications, are increasing, and, on the other, that demand is increasingly for highly qualified employment, fundamentally in sectors associated with state-of-the-art technology.

Below, we see some available data and indicators which show the described situation and the trends in industrial countries.

Investment in Knowledge. This is a synthetic indicator calculated as the sum of R+D spending, in software and total expenditure (public and private) on higher education. According to OECD data (2006), investment in knowledge is following a clearly growing trend. In 2002, this investment represented 5.2% of the GDP in OECD countries. However, it is interesting to note that from 1994 onwards the investment ratio in knowledge as a percentage of the GDP has grown more quickly in the United States and Japan than in the European Union of 15 members (EU-15). In 2002, investment in knowledge in the USA was 6.6%, in Japan 5% and in the European Union (EU-15) 3.8%.

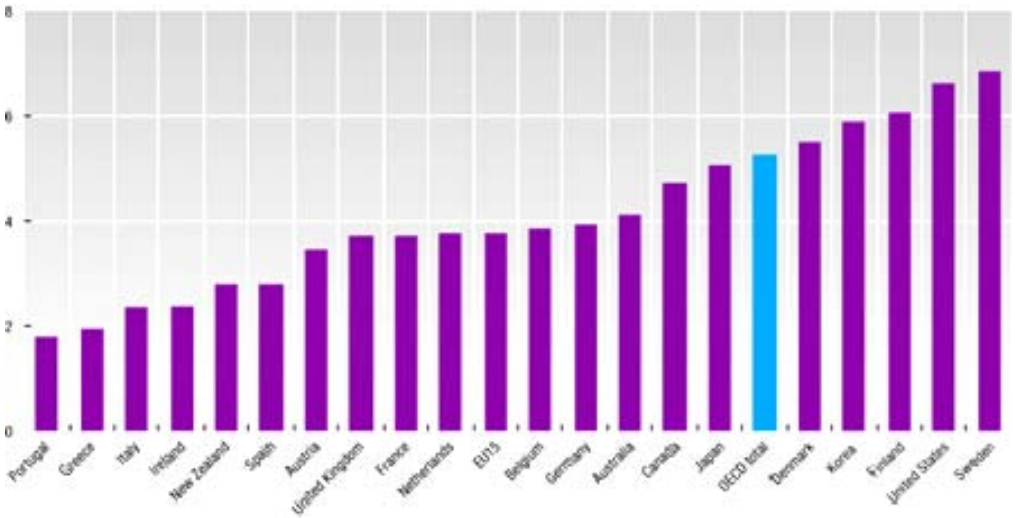
Nevertheless, there are notable exceptions as in the case of Finland, whose ratio for the same year was 6.1%, or that of Sweden which was 6.8% (see figures 2.4 and 2.5).

Figure 2.4. Investment in knowledge OECD countries



Source: OECD (2006)

Figure 2.5. Investment in knowledge as % of the GDP (2002)

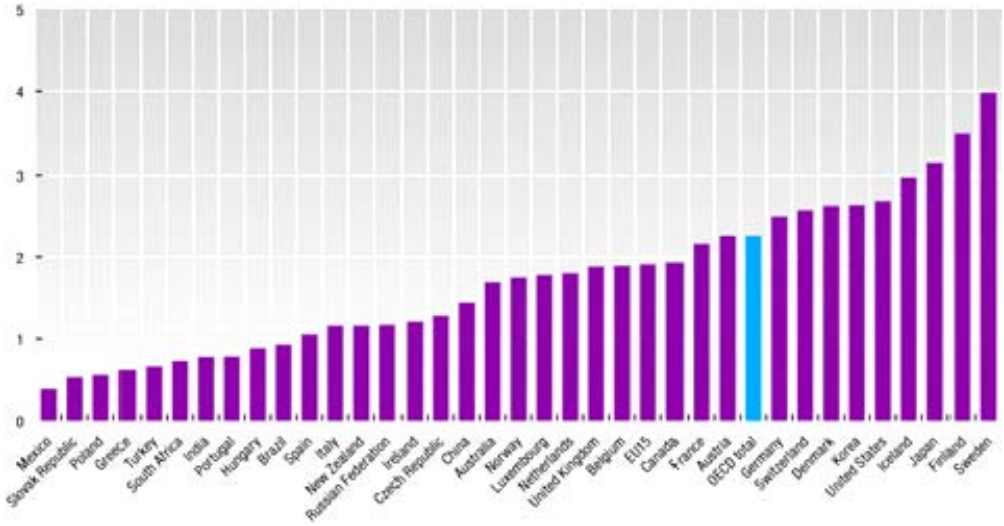


Source: OECD (2006)

Another key indicator for measuring the efforts made not only by governments but also the private sector to obtain competitive advantage in terms of science and technology, is the percentage of **spending on R+D** in respect to the GDP. According to data from the OECD report (2006), in 2004, this ratio rose to 2.26% in OECD countries (see

figure 2.6). If we analyse the trend in this indicator from 2000, we can observe it has increased in countries like Japan, and to a lesser degree in the EU-15. However, a small decline is registered in the United States. Iceland, Korea and Portugal are especially significant with ratios which have risen considerably from the beginning of the 90s. In 1991, ratios that stood at 1.18%, 1.84% and 0.57%, respectively, have gone up to 2.97%, 2.63% and 0.78%, respectively.

Figure 2.6. R+D Spending as a percentage of GDP (2004)



Source: OECD (2006)

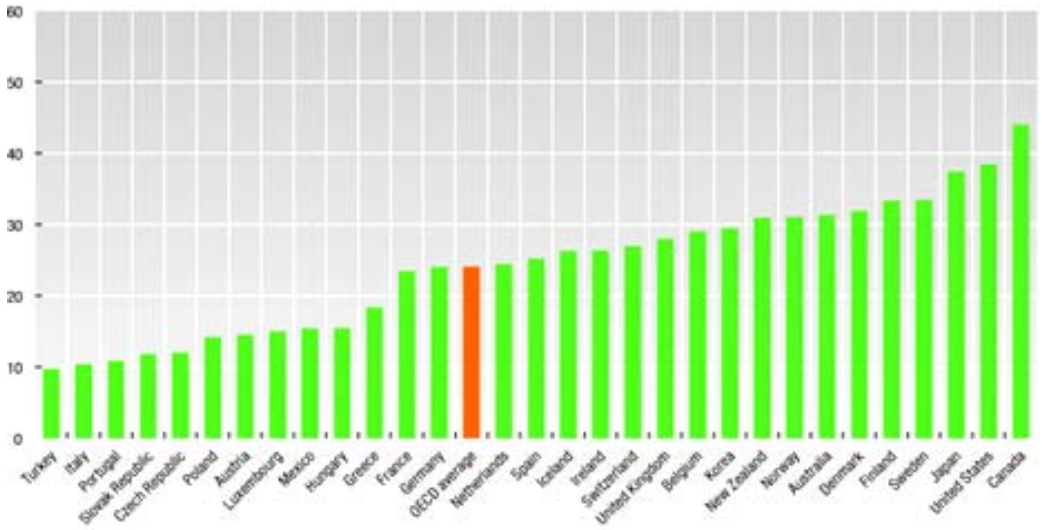
If we bear in mind that this new economy requires new workers' skills and competences, the quality and education of **human resources** becomes a vitally important factor, along with innovation and the diffusion of technology (OECD, 1999b). In general terms, about 25% of the population, taken as an average of OECD countries, has completed higher education in the group aged between 24 and 64, which represents an increase of approximately 7 percentage points with respect to the 1991 data. This figure increases to 29% if we are referring to the 25-34 age group (OECD, 2006).

As the figures 2.7 shows, the disparity among countries is still very clear. While in Italy, Portugal and Turkey, around 10% of the 25-64 age group has graduated from university, in Japan, Canada and the USA the figure is 40% (OECD, 2006).

Finally, it is interesting to note the **number of researchers** as a significant indicator. The OECD (2006) affirms that in 2002 about 3.6 million people were employed directly in research and development activities. This indicator, like previous ones, shows there

has been a slight increase. In 2002, there was an average of 8.3 researchers for 100 employees in the OECD countries, whereas in 1991 this indicator only represented 5.7. Nevertheless, the differences between countries are considerable. Although it is true that countries like Finland registered 16.4 researchers per 100 people employed in 2002, Italy only had 3 per 100, and Spain, Ireland and Holland registered just above 5 (OECD, 2006).

Figure 2.7. Percentage of the 25-64 age group that have finished high school (2003)



Source: OECD (2006)

These data show that, effectively, the economic paradigm is changing, and with it the sources for creating value and competitiveness for firms. Ever more voices in economic literature and business management are underlining the great importance of intangible assets in the success of organisations and their place in the market. The process of competition is now broader than the mere decision to set prices and production levels. It is no longer sufficient to acquire a plant or the most advanced machinery, as this only represents a very short-term advantage given that they are strategies which are easily plagiarised by the rest of the market. However, investments in intangibles (management, training, marketing, innovation, etc.) are difficult to perceive, and therefore difficult for competitors to copy (Webster, 1999). This is to say that the capacity to adapt to change, as well as continuously improve has become a basic requirement for achieving competitive advantage in this new environment (I.U.Euroforum El Escorial, 1998).

2.2. Intangibles and Intellectual Capital: Drawing a Conceptual Framework

2.2.1. Lacking a Shared Definition

Before looking more closely at the importance of intangibles, the tools and existing models that measure and manage them, it is advisable to define the principle concepts. Using a common language is fundamental not only to better understand the importance of these new elements in the economy but as a necessary first step to encourage internal and external reporting on IC (European Commission, 2003b). As explicitly recognised by the European Commission, having common concepts and taxonomies of intangibles "is becoming urgent so as to avoid the proliferation of words without precise encouragement" (European Commission, 2006b p.110). Accordingly, one of its recent recommendations was to set up an expert group to facilitate the development of consensus standardization of concepts and taxonomies (ibid., 2006)[8].

Until now there has been no consensus on the definition and classification of the term `intangible´. Throughout the literature on economics, accountancy and business administration there have been numerous definitions and classifications, some originating in evolutionary theories (Nelson & Winter, 1982) and others in theories of knowledge (Hall, 1992), offered by both the business community itself and organisms of a supranational character like the OECD or the European Union. Nevertheless, it can be stated that there is no general agreement on a definition, the way to classify it, its economic nature nor the way to evaluate and measure it (Blair & Wallman, 2001; Cañibano, García-Ayuso & Sánchez, 1999 and 2000).

It is not the aim of this work to present all the existing proposals on the concepts we are dealing with, but to designate the definition and classification adopted by this PhD research.

The term `intangible´ is usually used as an adjective accompanying different concepts, such as asset, resource, investment or activity, but on many occasions it is used as a noun. This in itself is proof of the difficulties in defining it (Cañibano et al., 1999; Sánchez et al., 2000).

[8] Recommendations included in the document entitled RICARDIS that will be explained in section 2.3.4 of this Chapter.

Among the innumerable proposals there is, for example, the one suggested by the Research Centre on Intangibles from the Stern School in the University of New York, which proposes the following definition of intangibles: "sources of future economic profit for a company, having no physical substance, and being acquired in an exchange or produced internally, having a finite life, a market value separate from the company but owned or controlled by it" (quoted in Cañibano, García-Ayuso & Sánchez, 1999).

For its part, the International Accounting Standard number 38 (IASC, 1998) defines them as "an identified non-monetary asset without physical substance held for use in the production or supply of goods or services, for rental to others, or for administrative purposes"; they are controlled by the company as a result of past events and from which the firm expects to obtain future profits.

From the business point of view, the Brooking Institution proposes the following: "non-physical factors that contribute to or are used in producing goods or providing services, or that are expected to generate future productive benefits for the individuals or firms that control the use of those factors" (Blair & Wallman, 2001; p.3).

In spite of the multiple definitions that we can find there are some elements that are common to all and that can bring us nearer a single definition. In general terms, for this PhD Thesis we assume `intangibles´ to be those elements that have no physical substance, that are a source of future profits for the company (they have already been acquired in the market or produced internally), and that can be sold (or not) separately from the rest of the company (Cañibano, García-Ayuso & Sánchez, 1999)[9].

Regarding the term `Intellectual Capital´ (IC), in a broad perspective, it can be defined as "the assets in a society that, although not reflected in traditional accounts statements, generate or will generate value in the future" (Bueno & Salmador, 2000; p.110). This is to say, it is the resources on which the organisation relies in the broadest sense, including not only human capital resources, but those of the organisation itself and its relations with the exterior.

[9] Definition based on the International Accounting Standard number 38 on intangible assets.

Bounfour (2005; in European Commission, 2006b; p.31-32) distinguishes two types of IC:

- Autonomous IC, which depends less on people and more on such elements as patents, brands, software, etc. (assets with a secondary market) and on reputation or image (assets without a secondary market).
- Dependent IC, which is more dependent on people, including: innovation, information and organisational capital, marketing and distribution and relational capital.

As Roberts (2000) states, the concept of IC is a term that has been conceived through practice; developed in, by and for business practice.

As much in this research field as in business practice, this term is usually used as a synonym of Intellectual Capital (IC). Despite being distinct concepts - “Intangibles” is used more in accountancy and “Intellectual Capital" in the literature on human resources and business management (Vickery, 1999) - they can be used indistinctly (Lev, 2000). However, and as argued in the MERITUM Project (2002), the concept of Intellectual Capital is broader as it takes in all kinds of intangibles, not only those formally owned by the firm but also those used informally.

For this reason, in this Doctoral Thesis both concepts will be assumed as synonyms and used indistinctly.

Finally, and accordingly to the previous definitions, we should mention that `management of intangibles´ is a broader concept that `knowledge management´, since the knowledge is one of the intangibles organisations should manage, but it is not the only one. Management of intangibles aims to identify, assess, measure and manage efficiently the intangible resources and activities in order to “enhance the firm’s value through the creation of competitive advantage” (Sánchez et al., 2000; p.317).

2.2.2. Most widely accepted Taxonomies

There have been different attempts by different bodies at micro and macro level to define an agreed classification or taxonomy of intangibles and IC[10]. However, as seen previously, there is no consensus on the definition of the concepts nor can one speak of homogeneous taxonomy.

According to the MERITUM Project, intangibles can be classified in `Intangible Resources´ and `Intangible Activities´ (see table 2.1). In harmony with the approach provided by Hall (1992), intangible resources are considered "assets" in its broadest and generic sense; i.e. including intellectual property rights, trademarks, information technologies and the capacities and competences of human resources. This is considered a statistic notion, and from this perspective, a firm's intangible resources can be measured at any given moment (stocks). But these resources can be analysed in dynamic terms, receiving the name of investments or intangibles activities. This is to say, steps taken by the company to acquire intangible resources externally or produce them internally, to increase the value of what is already owned, and evaluate and control the results of the intangibles activities. These activities obviously imply a cost for the firm, but given their characteristics, cannot always be identified and measured correctly, and, hence, they are not expressed in financial terms. In consequence, they do not figure in the company accounts (MERITUM Project, 2002).

Table 2.1. Static and Dynamic Vision of Intangibles

Static Notion	**Intangible Resources**		
	Assets	Capabilities	
Dynamic Notion	**Intangible Activities**		
	Develop or acquire new intangible resources	Increase the value of already existing resources	Evaluate and control intangible activities

Source: MERITUM Project (2002)

[10] For a broad review of the existing taxonomies and schemas of intangibles and IC see European Commission's study (2003b; pp.18-28).

The OECD (1992) states that, in spite of the interest shown in the concept of intangibles investments, there is no consensus on its categorisation, and proposes the following classification, which divides intangibles investments into three groups:

- Technological: which develop knowledge and the basic competences to introduce new products and processes (R+D[11], patents and licences, design and engineering, recognition activities and the search for new products and services, etc.).
- In human resources, fundamentally referring to organisational structures for training workers.
- In the market: in terms of exploration and organisation.

More than two decades have gone by and the search continues for taxonomy, for a formal construction whose basic characteristic is simplicity (Gröjer, 2000) and which is generally accepted by researchers and professionals. Along these lines, with a more academic bent, the research developed by Johansson (2000) stands out, using eleven Swedish companies with the objective of finding a way to classify intangibles from practice.

For its part, IC has also been categorised in different ways by academics and business management since the mid 1990s. It is important to stress the notable efforts that the business world is making in the search for a valid universal classification. Brooking (1996) presents this concept as the combination of four elements: market assets, human assets, intellectual property assets and infrastructure assets. For its part, the Swedish firm Skandia sees it as the sum of human capital and structural capital (which at the same time includes client/customer capital and organisational capital which itself is the sum of innovation and process capital). But, without doubt, the tripartite classification is the one that has the widest acceptation in specialised literature (MERITUM Project, 2002) and in political language (European Commission, 2006b), structuring IC in three blocks as shown in the following table:

[11] Software is included in the category “tangible investments in physical assets”.

Table 2.2. Elements of Intellectual Capital

- **Human Capital**: Referring to intangible resources capable of generating value that resides in individuals, such as their skills, capacities, knowledge, experience and training.
- **Structural Capital**: Referring to intangible resources capable of generating value that is found in the organisation itself, i.e. what remains without the employees; the routines, processes, the rights to intellectual property databases, business culture, etc..
- **Relational Capital**: Formed by intangible resources capable of generating value linked to the company's external relations. This includes its relations with customers, distributors, suppliers, the public administration, competition, etc. and also how the firm is perceived; its image, attractiveness, reliability, solvency, etc.

Source: MERITUM Project (2002)

Nevertheless, it is important to note that the real wealth from IC not only resides in the sum of the elements which make up the whole, but in the interconnections between them (Roberts, 1999).

2.3. Policies towards Intangibles

With the aim of improving the contents and decision-making in governmental policies, particularly those related to science and technology, innovation and education, stress must be placed on the need to take a serious look at the changes involved in the shift from a post-industrial economy to one based on knowledge. Accordingly, the OECD has established a series of multidimensional policy recommendations (see table 2.3), looking more closely at the idea that economic growth is not the result of isolated policies or mere institutional agreements, but of co-ordinated actions designed to create the right conditions for change and innovation (Visco, 2001).

As stressed by the OECD (2001c) the policies for intangibles should consist of two major actions: first, favouring investments in intangibles by providing fiscal incentives, subsidies or public investment programmes; second, increasing the rate of return on intangible investments by increasing the benefits of investment (cited in European Commission, 2003b, p.74).

Table 2.3. Policy Recommendations for a Knowledge-based Society

POLICY	MECHANISM
Strengthen the economic and social foundations	Assuring a stable macro-economy, opening and improving the way the market and institutions work.
Facilitate the diffusion of information and communication Technologies	Increasing competition in communications and technology, improving skills, and making confidence-building a priority with governments.
Favour innovation	Giving greater priority to basic research, improving the effectiveness of public R+D investment and promoting knowledge flows between science and industry.
Invest in human capital	Strengthening education and training, making the teaching profession more attractive, as well as improving the links between the educational system and the working place.
Stimulate the setting up of companies	Improving access to high-risk financing, reducing the time-consuming/tiresome administrative regulations and maintaining a positive attitude towards employers.

Source: OECD (2001d)

However, although these policies attempt to encourage growth and economic development more or less directly through innovation and knowledge by putting more emphasis on the less tangible elements of the economy, and reflecting the awareness of governments and policy makers of intangibles, we cannot say that they can actually be defined as a "policy for intangibles".

Recognising that there is a lack of information on intangibles in organisations and with the aim of encouraging public and private organisations to measure and disclosure their IC, the European Union and some national governments have endeavoured to provide political recommendations for better understanding and implementing IC approaches. Although it is widely recognised that intangible assets are the main drivers of growth and wealth, the general guidelines supported by Governments and the European Union still consider the measurement and diffusion of IC as voluntary, so that organisations are not compelled to report it.

In this sub-section we briefly highlight the most relevant and recent guidelines developed at national and European level. Following a chronological order: MERITUM

Guidelines (2002), Danish Guidelines[12] (1997 and 2003), Japanese Guidelines (2004)[13], Australian Guiding Principles (2005)[14] and RICARDIS (2006)[15].

2.3.1. MERITUM Guidelines

The first internationally relevant document that we should highlight is the Guidelines document developed by the MERITUM *(Measuring Intangibles to Understand and Improve Innovation Management)* Project. This project was funded by the European Commission V Framework Programme between 1999 and 2001 and developed 77 case studies in six European countries (Spain -coordinator-, France, Finland, Sweden, Denmark and Norway).

Best practices in firms with regard the management of intangibles were analysed and it was possible to identified three steps or phases in this process: the identification of critical intangibles in the value creation process, the measurement of those intangibles throughout a set of indicators, and the monitoring of intangibles resources and activities (Sánchez et al., 2000).

The final result was a practical guide focused on the best practices for measuring and reporting on the intangibles in participating firms and tested by experts through a Delphi analysis (Sánchez et al., 1999; MERITUM, 2002). It also provides detailed suggestions for IC disclosure. It is the only experience on IC for organisations at a European level.

The MERITUM guidelines contain three different parts: (a) the vision of the firm, (b) a summary of intangible resources and activities, and (c) a system of indicators.

Besides, one of the main contributions of the Project was the used and diffusion of tripartite classification of IC aforementioned: Human, Relational and Structural, today internationally used by most of the IC models.

[12] See: Danish Trade and Industry Development Council (1997 and 2003).
[13] See: Johansson, et al. (2006a and 2006b).
[14] See: Society for Knowledge Economy (2005).
[15] See: European Commission (2006b).

2.3.2. Danish Guidelines

One of the most relevant efforts and most contrasted guidelines is the document entitled: "Intellectual Capital Statements: the New Guideline" (2003). This Guideline was the result of joint work developed by researchers, companies, industry organisations, consultants and civil servants under the coordination of the Danish Ministry of Science, Technology and Innovation. The main motivation or idea that underlined this initiative is that Denmark "need(s) to secure and develop our (its) prosperity and welfare" (Mouritsen et al., 2003; p.5).

The first guideline was published in 2000 and was tested by 80 Danish public and private organisations in a follow-up project organised by the Danish Ministry of Science, Technology and Innovation in 2001-2002. Based on the experiences of 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 IC. 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.

Based on the experience of the Danish organisations, the ICR has four main elements (Mouritsen et al., 2003):

- A knowledge narrative that explains the organisation's strategy for knowledge management.
- A set of management prescriptions that help to identify the actions that should be implemented to accomplish the above mentioned strategy.
- In coherence with the strategy defined by the organisation, a set of initiatives or actions to develop the organisation's IC.
- Finally, a battery of indicators in order to make it possible to follow the organisation's achievements.

From the public sector perspective, Mouritsen et al. (2004) reflect on and discuss the 26 Danish public sector organisations' experience to develop IC statements for 2001-2002. In particular, the authors explain in detail the management challenges and efforts, as well as the actions and indicators of three specific public institutions: the

Customs and Tax Region Odense, the Danish Maritime Authority and the Danish Defence Construction Service.

Although the use of the Guidelines proposed by the Danish Government is voluntary, companies are required "to disclosure in their management report information on their IC, if this is a relevant aspect of their economic activity" (European Commission, 2006b; p.60).

2.3.3. Japanese Guidelines

The Japanese Government has been making a significant effort to stimulate and encourage IC reporting in private firms. In 2004, the Guideline "Intellectual Property Information Disclosure" (Japanese Ministry of Economy, Trade and Industry (METI), 2004) was published.

Particularly designed to be useful for small and medium-sized corporations as well as start-up companies and big corporations, this document is based on five basic principles (METI, 2004; pp.7-8 and Johanson et al., 2006; p.5):

- The application of the guideline is voluntary. However, its use is highly recommended since it will function as "a common language of communication", between companies and markets on intellectual property.
- The objective is to present a picture which is in accordance with corporate intellectual property management.
- It is desirable to add quantitative data in order to avoid any misinterpretations.
- It is important to maintain the format and basic assumptions in order to assure consistency over time.

One year later, the METI published the "Guidelines for Disclosure of Intellectual Assets Based Management" (METI, 2005). This guideline suggests an IC report based on the basic management philosophy and business characteristics taking into account a time perspective. Accordingly, the IC report should be structured in three main parts: (a) a general part explaining the strategic objectives and vision of the firms, (b) a perspective "from past to present", including the management policy in the past and the intellectual assets accumulated in the company, and, lastly (c) a perspective "from present to future", stressing the future value creation process and additional investment for

developing and maintaining the intellectual assets.

It is desirable that the Intellectual Assets based Management Report includes the following elements (METI, 2005; p.3):

- Vision and business characteristics
- Present and predicted performance
- Intellectual assets and value creation method
- Identification of future uncertainty and how to deal with it
- Intellectual assets indicators such as KPI to support the above

2.3.4. Australian Guiding Principles on Extended Performance Management

The publication of these guidelines was commissioned by the Society for Knowledge Economy, whose principle objective is to "help improve organisational productivity and performance through the better management of knowledge and innovation" (Society for Knowledge Management, 2005; p.5).

By publishing this document, the central purpose was to give guidance to organisations on making visible all the intangibles resources that are not recorded in traditional accounts. In this way, the guidelines introduce the concept of `extended performance management´ and `extended performance accounts´. It is assumed that some organisations will only use this process for internal management purposes but there are others that might also choose to publish information about their intangibles externally. It is, therefore, expected that there will be potential benefits at both levels.

The Guiding Principles, published in 2005, were intended for a broad target audience, although the following are cited as the most relevant: Australian public and private organisations, as well as investors and professional bodies.

The document proposes a simple framework for developing an "extended performance account" as a strategic matrix, and a set of phases to help managers to implement the model in their own organisations. The strategic approach and future orientation are clearly highlighted (see table below).

In order to help organisations to develop the model, the document includes three steps (Society for Knowledge Economy, 2005; pp.50-55):

(a) Business orientation, mainly referring to the identification of strategic business objectives,

(b) Business analysis: which includes four phases: market analysis, stakeholders analysis, resource composition analysis and resource management analysis; and

(c) Performance assessment.

Table 2.4. Framework for Structuring an Extended Performance Account

	Strategic Objectives	**Managerial Efforts**		**Indicators (internal & external)**		
		Current Activities	Planned Actions	Indicators	Past / Current	Target
Relational Capital						
Structural Capital						
Human Capital						

Source: Society for Knowledge Economics (2005; p.39)

2.3.5. European Commission IC Recommendations

In December 2004, the Directorate General for Research and Technological Development of the European Commission set up a High-Level Expert Group to recommend a set of measures to stimulate small and medium-sized companies (SMEs) to report on their intangibles. The main assumption which supports the recommendations for reporting is that IC is the hidden driver of the knowledge-based economy and that diffusing information on IC may stimulate and make the organizations' R&D efforts more visible. The idea that underpins this European initiative is that "stimulating IC reporting requires an approach from the European Commission aimed at a process of coordination and convergence of guidelines that will empower national policies and will allow translation and adoption in the various member states" (European Commission, 2006b; p.13).

The final aim of the document produced by the Group (RICARDIS -Reporting Intellectual Capital to Augment Research, Development and Innovation in SME's-) was to set out a number of recommendations[16] for research intensive SMEs and other stakeholders; and also for public policy-makers on how to encourage organisations to report on IC (European Commission, 2006b; p.7). Following its recommendations, governmental policy actions should be aimed at four main areas: raising IC awareness, improving IC reporting, promoting the use of IC reporting, facilitating the standardization of IC.

This document is especially relevant for universities and research centers, since they include a specific recommendation about the importance of managing and reporting IC in these institutions. Specifically, it suggests that:

a) Universities and similar institutions should be assisted to see the advantages, both for their internal management and relations with society, of managing and reporting IC.
b) Under-graduate and postgraduate education and training in the identification, management and communication of intangible assets should be provided to students, and
c) Funding agencies should establish IC reporting requirements, but only in an environment of increased support and funding and not as tool for *cutting back* or *budget restriction*.

The document states that "IC Reporting could improve both the transparency in governance and in their resource management. This could make a valuable contribution to their competitiveness and attractiveness to the most 'forward looking' students and academics of the European Higher Education System" (ibid, p. 102).

2.3.6. Synopsis

Although the Guidelines previously described have been designed with mainly private firms in mind, important lessons and best practices can be gleaned from these experiences. As we will explain in chapter 5, we have actually based the design of the

[16] The Group of Experts has formulated seven policy recommendations, proposing actions, actors and rationale for the activities. For more information see European Commission (2006b; p.99 -100).

tentative Intellectual Capital Report for Universities on the main principles of the mentioned guidelines.

Summarising the result of the analysis of the guidelines on intangibles published or supported by governments and the EU, it could be said that there are more converging elements than divergences. All of them are voluntary and stress the importance of linking the IC management and report with the internal strategic objectives and vision of the organisation. Furthermore, they all highlight the importance of visualising the value creation process over time and including a battery of indicators to measure the intangible resources and activities. As pointed out by the High Level Expert Group in the RICARDIS Document, though all the existing guidelines are very useful and excellent guides, "in the long run, the convergence of the existing guidelines should be sought" (European Commission, 2006b; p. 25). The next table illustrates a tentative synopsis of the five Guidelines described[17].

[17] See European Commission (2003b) for other tentative comparisons with the IFAC Study nº 7, MERITUM Guidelines, Danish Guidelines and Nordika Guidelines.

Table 2.5. Synopsis of the Main International Guidelines on Intangibles and IC

	MERITUM	Danish Guidelines	Japanese Guidelines	Australian Guidelines	RICARDIS Document
Main Objective	Measuring and diffusing intangibles in order to improve the decision–making process at firm level and the science and technology policy design	Having an instrument for the management and reporting on IC	Stimulating and encouraging IC reporting in private firms	- Raising public awareness on intangibles, particularly among users (employees, shareholders, customers, etc.); - Assisting Australian organisations to understand better the value and performance of their knowledge intense resources.	Setting recommendations to stimulate reporting of IC for business mangers and public policy makers
Supported by	V Framework Programme: Jointly developed by research groups of six countries.	Danish Ministry of Science, Technology and Innovation	Japanese Ministry of Economy, Trade and Industry	Australian Government Consultation Committee and Australian Information Management Office	Directorate-General for Research (European Commission). Programme: Integrating and Strengthening the European research Area
Main users focus	European companies across sectors	Danish public and private organisations	SMEs, start-up companies and big corporations	Australian public, private and third sector organisations; government officials; investors and professional bodies	Research intensive SMEs. Special recommendation for Higher Education Institutions and research centers
Scope	European	National	National	National	European (EU-25)
Level of Adoption	Voluntary	Voluntary	Voluntary	Voluntary	Voluntary
Implementation Process	Three phases: (a) Vision of the firm, (b) summary of intangible resources and activities, and (c) a system of indicators.	Four elements: (a) knowledge narrative, (b) management challenges, (c) actions, (d)battery of indicators	Three phases: (a) management philosophy, (b) from past to present, (c) from present to future	Three Steps: (a) Business orientation, (b) Business analysis: and (C) Performance assessment	Five dimensions: (a) taking stock of IC, (b) planning investments in IC, (c) IC internal communication, (d) internal management using IC and (e) reporting of IC.
IC taxonomy	Human, Relational and Structural Capital	No specific proposal	No specific proposal	Human, Relational and Structural Capital	Human, Relational and Structural Capital

Source: The Author

2.4. Micro–Economic Analysis: Intellectual Capital in Business Management

As mentioned before, this new situation also has repercussions at a micro-economic level, as it is transforming the processes of value creation, which, at the same time, forces organisations to rethink their models of internal management. As already argued in the preceding epigraphs, the structural changes taking place in the OECD countries reflects the growing importance of the production, diffusion and use of knowledge and information when improving competition in companies (OECD, 1999b). The traditional tangible resources are losing ground to intangible assets (Cañibano, García-Ayuso and Sánchez, 1999 and 2000). So it is vital for the firm to know how to manage these intangibles effectively, because their success and place in the market depends on it. Accordingly, knowledge can provide sustainable competitive advantage because it generates an increase in yield and continual advantages. While the material assets decrease as they are used, so knowledge assets increase: ideas bring new ideas (Davenport & Prusak, 1998). On these lines, the authors affirm that explicit recognition of knowledge as a corporative asset constitutes in itself a novelty in terms of business management.

In a rapidly changing, dynamic world where new communications and transport offer consumers the opportunity, without precedents, of acquiring products and services in unlimited companies worldwide, organisations must look for new ways to differentiate themselves from the competition. For this reason, today, more and more management and consultants talk of knowledge as the principal key asset in sustainable competitive advantage (ibid., 1998). As James Brian Quinn said, “the intangibles that add value to most of the products and services are based on knowledge: technical know-how, product design, marketing, creativity, innovation” (in Nonaka & Takeuchi, 1995).

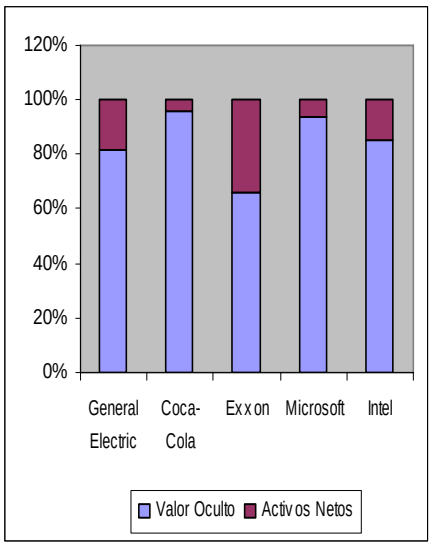
The firm, conceived as a “black box” by classic economic theories, is now being studied by new disciplines which are paying special attention to the dynamic interior of this “box”, to the knowledge embedded in routines, practices and processes that the company transforms into products and services with added value for the consumer (Davenport & Prusak, 1998).

Nevertheless, despite the relative existing consensus on the relevance of intangible resources, accounting reality makes no echo of this growing importance and has no

adequate measuring systems. The fact that the traditional accounting systems are based on historical cost explains why most intangibles are not included in the conventional financial statements and why they are considered the "hidden driver" of the economy (European Commission, 2006b).

At the moment, diverse research, among which the study made by Lev (2000) stands out with a sample of the 500 largest companies in the USA, show that the average market value of a firm is normally nine times the value reflected in its books. As empirical evidence demonstrates, the five companies most highly quoted on the New York Stock Exchange have a market value which far exceeds what is reflected in their Statement of Accounts (see figure 2.7).

Figure 2.8. Market Value and Assets (thousands of millions of $)



COMPANY	MARKET VALUE	ASSETS	"HIDDEN VALUE"
General Electric	169	31	138 (82%)
Coca-Cola	148	6	142 (96%)
Exxon	125	43	82 (66%)
Microsoft	119	7	112 (94%)
Intel	113	17	96 (85%)

Source: Classification from the magazine Fortune 500, 28th April 1998 (Ross et al., 1997)

As Edvinsson and Malone (1997) put forward in their work "Intellectual Capital", there have always been temporary vacuums between the perception that the market has of a particular business organisation and the reality that the annual accounts show, but now this breech is turning into an abyss. As an answer to this, written opinion coincides in giving name to this hidden value which is found behind the difference between the market value and the financial statements, it is what is known as Intellectual Capital.

Although this difference has not passed unnoticed in economic history, until a relatively short time ago it was considered a merely subjective factor which was very difficult to

measure as it was thought to be caused by rumours and investor and shareholder expectations. However, this is hardly the case. In the present knowledge economy, the most relevant flows are those of information, investments in human capital and information technology, and surprisingly none of these appear explicitly in traditional accounting (Edvinsson & Malone, 1997). It can, therefore, be stated that the information recorded in traditional accounting does not comply with the needs for information of managers, investors, shareholders or customers.

Organisations like the FASB (Financial Accounting Standard Board) do not deny the fact that intangible elements are creating added value and profits to the company and argue that the assets may be intangibles and although they are not interchangeable they can be useful for the firm in the production or distribution of other goods or services. Everything that is commonly employed to produce goods or services, whether tangible or intangible, whether it has a market price or is interchangeable also generates future profits (FASB, 1985).

However, the basic problem when entering these intangibles in the books arises from the recognition of these as assets. Some of the limitations that are seen when including specific information in the accounting system are due to the accounting structure, itself. The most important objections to their recognition in practice comes from the uncertainty associated with intangibles profits and the fact that, in some cases, the firm cannot totally control them (as for example unpatented know-how) (Lev, 2000).

Additionally, it must be kept in mind that the immense amount of literature that this field of research is generating not only points out that there are severe deficiencies in the accounting and publication of information on intangibles that should be resolved, but that if this is not done, again citing Lev (2000), they will not be correctly integrated into business management systems. In spite of this, what can be affirmed is that intangibles are taken into consideration informally in decision-making and management processes (Cañibano, García-Ayuso and Sánchez, 1999). This fact verifies the importance that firms give them with regards objectives and internal management. However, although effectively management is employing indicators of a non-financial nature on a day-to-day basis, there are no good systems or applications to measure or evaluate the critical intangibles in the company. Because of all this, it is of vital importance to develop a

suitable intellectual capital measuring system or instrument that facilitates its identification and measurement, and enables systemisation with time.

The objectives that should take priority in this measuring system are, on the one hand, those that increase company competitiveness and, on the other, improve internal management efficiency.

In short, if it can now be said that the creation of company wealth does not exclusively depend on physical and financial assets, but that intangible assets are acquiring a growing importance, it is essential to identify them, as a previous step, in order to be able to manage them efficiently and, at the same time, have them generate value. What is therefore required is a revolution in measuring systems, so that knowledge and intangibles become the axis (I.U.Euroforum, 1998).

Accordingly, as many researchers and professionals state, despite the doubtless need for a profound change in traditional accounting systems that necessarily requires regulatory intervention, it is important to begin with voluntary initiatives to manage and diffuse information on intangibles that with time will bring significant changes in accountancy norms.

Achieving a more complete information model which reflects the critical intangibles of a company and its inter-relationships will be a way of democratising and giving more transparency to the decision-making process as much in organisations as in financial markets (Lev, 2000). Democratise in the sense that a more complete system will facilitate greater information to a growing number of individual investors that use the markets without investment advisors, and whose decision-making process will be simplified. Greater transparency, for its part, is explained by the number of decisions that in a present-day company are shared in some way with external agents such as suppliers of sub-contracted services, strategic alliance partners, etc., who demand more in-depth information published in the financial statements.

The key to achieving a substantial improvement in management systems and the diffusion of information on intangibles is to build a comprehensive and coherent structure of information that focuses on the value creation process of a company.

There have been great efforts, especially in the 90s, centred on designing a tool capable of measuring the intellectual capital in companies. Researchers, company directors and consultants have started up different models with the aim of improving the internal management of the organisations thanks to the identification and measurement of their intangible assets.

It is not the object of this work to make an exhaustive review of each and every one of the existing contributions and initiatives since there are as many models for measuring and managing intangibles as there are firms and organisations interested in the question[18]. Nevertheless, some experiences, as much at an international as national level, should be an obligatory point of reference for academics and professionals. Internationally, the models with the most repercussion are: Balanced Business Scorecard (Kaplan and Norton, 1992 and 1996); Navigator of Skandia, (Edvinsson and Malone, 1997); Technology Broker (Brooking, 1996); Intellectual Asset Monitor (Sveiby, 1997), and the MERITUM Project (2002). Nationally, one of the most relevant models is the one produced by the I.U Euroforum (1998): the denominated Intellect Model. The table 2.6 presents, briefly, the most relevant contributions from each of these models.

In spite of the fact that each of these models has its own characteristics, it is possible to identify a number that are common to all and give us some very valuable clues for improving the models themselves and, even learning from them and being able to adapt them to other kinds of organisations:

- They are not limited to being mere measuring systems, but really represent new internal management models.

- They question the generally accepted premises of traditional accounting.

- They are characterised by a structure of simple indicators which are easy to handle and very clear.

- They include non-financial and qualitative indicators.

[18] The RICARDIS document (European Commission, 2006b; pp. 63-73) provides a review of the different existing IC models, ranging them from “classical evaluation of intellectual assets” to “modern” evaluation methods. The European Commission’s report (2003b) reviews the IC and Intangibles Methods in Chapter 5, section 5.3, pp.160-185.

- All the Models are articulated according to the company vision, strategy and corporative objectives.

- As a consequence of the last point, they are not conceived as Universal Models, but must be adapted to the needs and context of the organisation.

- These models are articulated with a double objective: to improve the internal management and diffusion of more and better information to third parties. The contributions made by Sveiby and Skandia are those that put special emphasis on this double dimension.

- The models take for granted that top management, like the rest of the employees, will be involved in the development and putting into practice of the measuring system to ensure its success.

- The firm is thought of as dynamic and attempts are made to introduce the temporary variable in diverse ways.

Table 2.6. Most Relevant Contributions towards an IC Model at Firm Level

MEASURING MODELS	MOST IMPORTANT CONTRIBUTIONS
Balance Score Card (Kaplan and Norton)	▪ It is the first attempt to integrate non-financial indicators in a business management system. ▪ It provides a structure and battery of simple, easily manageable indicators. ▪ Analysis of the chain of company value is integrated in the model. ▪ It balances the short and long-term perspective.
Monitor of Intangible Assets (Sveiby)	▪ It provides a clear and precise taxonomy of Intellectual Capital in three categories: Human Capital, Structural and Relational, which is the one retained in later initiatives. ▪ It makes a key distinction between business and diffusion objectives. ▪ It breaks with the conception of an industrial firm and considers it a "knowledge organization".
Navigator (Edvinsson)	▪ It constitutes the first practical application of a system for measuring and managing intangibles in a company. ▪ It represents a rupture with classic accounting and is pioneer in the publication of an Intellectual Capital Report. ▪ It emphasizes the idea of a double perspective of internal management and diffusion to third parties of information on intangibles. ▪ It provides an important conceptual novelty by including the feature of "time" (past, present and future) with the aim of making the model more dynamic
Technology Broker (Brooking)	▪ It develops a new concept of the Generic Audit of Intellectual Capital. ▪ It emphasizes qualitative aspects as sources of wealth and competitive advantage.
MERITUM Model	▪ It has a multi-national and inter-disciplinary dimension. ▪ The suitability of the Model is contrasted in different firms ▪ It is characterised by its flexibility and adaptability to companies in diverse sectors and dimensions. ▪ It develops the complementary aspects of the statistic notion (intangible resources) and statistics (intangibles activities). ▪ It provides some universal Directives for the management and diffusion of intangibles. ▪ It has continuance with the Project E*Know-Net
Intellect Model	▪ It is applicable to business practice ▪ It has considerable diffusion at a national level.

Source: Elena (2002)

2.5. Some Final Considerations

Nowadays it is widely accepted that intangible assets and investments are the dominant factors in economic wealth and in the value creation process in companies. As argued in this chapter, since the second half of the 20th century, various Economic and Business Organisation theories have recognised that the competitive advantage within the so-called knowledge-based economy has shifted from material and financial

assets to intangible and non-financial ones. A brief overview of the main theoretical roots - from Solow´s studies on technological change (1957) to evolutionary economic theories (Freeman & Soete, 1997) - , have been presented.

However, this shift reflected in the specialised literature has not led to the necessary changes in the traditional accounting or measurement systems at either the macro or micro level. Because of this, the OECD (1996) stressed that the traditional national accounts no longer offered convincing explanations of the trends in economic growth, productivity and employment. There is, therefore, an urgent need for information and data that give a better understanding and management of intangibles and IC, regarding both the stock of intangibles and the activities that organisations are developing to improve them (Foray, 2004).

Given the lack of consensus on the definition and classification of the terms `intangible´ and `intellectual capital´, in this chapter we have presented some of the most relevant definitions, taxonomies and notions that are used in this PhD research. Indeed, both concepts are assumed as synonyms and used indistinctly.

Concerning the problems of measurement, we have described some of the most relevant indicators that are being used by the OECD and which enable the analysis of this change of paradigm from the macro-economic point of view: investment in knowledge, spending on R&D, the level of education and the number of researchers have been highlighted.

Accordingly, the OECD and the European Union have established a series of policy recommendations looking more closely at the idea that economic growth is the result of intangibles assets and investment. In general terms, policies for intangibles should consist of two major actions: favouring investments in intangibles by providing fiscal incentives, subsidies or public investment programmes; and increasing the rate of return on intangible investments by increasing the benefits of investment (OECD, 2001c). These policies attempt to encourage growth and economic development more or less directly through innovation, information and communication technologies, human resources and knowledge by putting more emphasis on the less tangible elements of the economy, and reflect the awareness of governments and policy-makers of intangibles. Nevertheless, it cannot be defined as a “policy for intangibles”.

For this reason, recognising that there is a lack of information on intangibles in organisations and aiming at encouraging public and private organisations to measure and disclose their IC, the European Union and some national governments have endeavoured to provide political recommendations for better understanding and implementing IC approaches. In this chapter, the most outstanding guidelines developed at national and European level have been highlighted: MERITUM Guidelines (2002), Danish Guidelines (2003), Japanese Guidelines (2004), Australian Guiding Principles (2005) and RICARDIS (2006). Although all of them are different, it could be said that there are more converging elements than divergences. All are based on voluntary approaches and stress the importance of linking IC management and reporting with internal strategic objectives and the organisation's vision. They also highlight the importance of making the value creation process visible over time and include a battery of indicators to measure the intangible resources and activities. A synopsis stressing the main aspects of the aforementioned guidelines has been presented.

In addition to the shortcomings associated with measuring at macro-level, this new paradigm also has repercussion at a micro-economic level, transforming the processes of value creation, and, at the same time, forcing organisations to rethink their models of internal management. As a result, there have been numerous efforts, especially in the 90s, focused on designing a tool capable of identifying, measuring and managing IC in companies. Researchers, company directors and consultants have started up different models with the aim of improving the internal management of the organisations by identifying and measuring their intangible assets.

Given the enormous variety of models and systems developed by firms, we have only highlighted those experiences that should be considered an obligatory point of reference for academics and professionals. Internationally: the Balanced Business Scorecard (Kaplan and Norton, 1992); Navigator of Skandia, (Edvinsson & Malone, 1997); Technology Broker (Brooking, 1996); Intellectual Asset Monitor (Sveiby, 1997), and the MERITUM Project (2002). Nationally: Intellect Model (Euroforum El Escorial, 1998).

Despite the fact that each of these models has its own characteristics, we have identified some shared features, for instance, that these models are not limited to being

mere measuring systems, but represent new internal management models that question the generally accepted premises of traditional accounting; they are characterised by a structure of indicators, including non-financial and qualitative indicators; they are articulated according to the organisation vision, strategy and corporative objectives; and that they are intended to improve internal management and to diffuse intangible information to stakeholders.

In sum, the concepts and ideas presented in this chapter are most valuable for the analysis of the application of IC models in public organisations and set up the theoretical framework that will help us to answer the research questions defined at the beginning of the PhD Thesis.

3. VISUALISING THE HIDDEN VALUE OF THE PUBLIC SECTOR

As discussed in the previous chapter, the knowledge intensive economy is leading to important changes in society and in both private and public organisations due to the fact that today knowledge is probably the key source of economic development and wealth. Indeed, there has been considerable literature devoted to explaining why knowledge is considered a crucial public good and essential for a country's overall competitiveness and development (OECD, 2001a)

In particular, the knowledge-based economy is pressurising the public sector in three different aspects (ibid., 2001a; pp.12-13):

- Due to the globalisation and privatization processes, public organisations no longer have the monopoly on knowledge. These organisations are, therefore, under pressure to increase the knowledge basis of their activities and to integrate new knowledge.

- Greater importance of the citizens, who are increasingly demanding individual solutions. So governments have to `customise´ their policies and services, which makes public activities much more complex.

- More rapid staff turnover. The culture of life-long employment in the public sector is changing in most OECD countries.

The OECD (2001a) states that the public sector has a unique role in promoting the production, use and transfer of knowledge, specially: (a) providing knowledge not traditionally offered by private firms, as, for example, basic research; (b) ensuring education and information for society as a whole; (c) constructing `information super highways´, and (d) regulating knowledge production, transfer and use, for instance throughout intellectual property rights.

However, while there is a widespread trend in private companies of managing their knowledge and IC, there is "little evidence that the same systematic organisational changes are taking place in the public service organisations of most OECD Member countries" (ibid., 2001a; p.19). Hence, the key question is how public organisations can improve their practices to adapt to the requirements of the knowledge-based economy and manage their knowledge and other intangibles assets better.

Accordingly, the purpose of this chapter is to twofold: to illustrate the major changes that the public sector is facing in the new knowledge paradigm mainly related to improving internal management and increasing the level of transparency -, and to justify why we consider that IC models can be a valid instrument to deal with these two challenges.

Furthermore, we present a number of governmental and academic endeavours as well as some outstanding initiatives at organisational level for visualizing, measuring and managing IC in the public sector. Finally, some concluding remarks are made.

3.1. Modernization of the Public Sector: Towards Strategic Management and Transparency

3.1.1. Introduction

The transformation of the public sector has been an important issue on the political agenda and a major theme of interest for professionals and academics in the past two decades.

When talking about the public sector's transformation and public management, there is a need to highlight the main characteristics of what was coined the New Public Management (hereafter: NPM). Under this heading, we find the changes that occurred

in the public sector in most OECD countries[19] during the 80s and 90s which mainly concern public accountability and are intended to guide public administrations towards a more efficient model (Hood, 1991 and 1995; McLaughlin et al., 2002).

There is a large amount of literature covering various aspects of the NPM[20] but it is not our main objective to discuss this trend in detail. However, its principal ideas can be summarised in the following seven characteristics: (a) professionalism in the public sector; (b) performance standards and measurements; (c) emphasis on output control; (d) emphasis on the shift to desegregation of units in the public sector; (e) shift from hierarchies to a more competitive basis for providing public services; (f) introduction of private sector management practices and tools; and (g) stress on discipline in resource use (Hood, 1991 and 1995). Despite these general aspects, it is important to note that NPM is not, in the realm of practice, a unified set of features and practices which are unified but ones that vary depending on the sector (health, education or social services), and even within it (Dent et al., 2004).

Beyond the NPM doctrine, public sector transformation is still a priority for industrialised countries. Because of the urgent need to respond to not only the rapidly changing environment and pressures resulting from globalisation but also the knowledge paradigm and the new societal and fiscal demands, "public management reforms to enhance performance continue to be an important issue for all OECD governments" (OECD, 2003b; p.27),

Our main concern in this PhD Thesis – the identification and management of intangibles and IC in the public sector- is mainly related to one of the most relevant characteristics of the public sector reform: the introduction of managerial tools that have been traditionally used by business. Accordingly, the next sub-sections are focused on the implementation of management tools in public organisations, stressing the importance of improving internal management and increasing transparency levels.

[19] Although NPM doctrine has been applied to different OECD and non-OECD countries, the UK had an essential role in the development of this notion and can claim to be its `birth place´ (McLaughlin et al.2002). However, it is important to note that there were significant variations in the degree to which NPM principles were taken up by different countries in the 1980s (Hood, 1995).

[20] Some of the literature associates this trend mainly with countries with Anglo-Saxon tradition, with right-wing political parties and with fiscal stress and macroeconomic failures. However, some authors, like Hood (1995), claim that these ideas do not correspond to any analysis of reality and that NPM principles have also been implemented in other circumstances.

3.1.2. Managing Public Services

Managing the public sector is not an easy task. It is especially difficult since, as pointed out by the OECD (2003b; p.7): (1) public outputs are specially complex and difficult to define, (2) inputs are not easily measurable, and, as a consequence, (3) it is difficult to assess public sector efficiency. In addition, the vast majority of its inputs and outputs are intangibles.

In general terms, it can be argued that during the 1980s and 1990s the public sector was subject to intense transformation processes mainly motivated by two factors: (a) the economic and fiscal pressures, and as a result, the growing importance of managing public money efficiently, and (b) the new societal demands for better services (Joyce, 1999). The idea of managing public services more like business was, therefore, very popular among politicians during the 80s, especially in Anglo-Saxon countries.

However, public organisations differ from private firms in essential aspects. According to Bossi et al. (2005) eight specific characteristics distinguish the public from the private sector:

- Less incentive to adopt new management approaches, due to a non-competitive environment.
- Intangibles objectives; less linked with the market value and with financial profit.
- More importance given to social and environmental responsibility.
- Most of the public organisations provide services (education, health, etc.), i.e., intangibles.
- The most important resources used by the public sector are intangibles: knowledge and human resources.
- Inflexible management procedures and rigid structures. The bureaucratic model does not facilitate new approaches.
- Less necessity to quantify.
- Increase of external demand for accountability and transparency in the use of public funds.

In addition, as highlighted by Echevarria & Mendoza (1999, in López, 2003; p.14), the public sector attitude differs from market rationale for the following reasons:

- The resource allocation process follows a political process and not market values.
- Some public organisation objectives are not defined by the organisation itself but by national Constitutions or laws to assure citizens' rights.
- The value creating process in public organisations is very much conditioned by social perceptions. For this reason, issues such as transparency, equity or non-discrimination are part of the final value of the public service.
- It is difficult to measure the value of the final product or service, since in most cases it has no market price.

Organisations in both the public and private sector have developed initiatives to generate methodologies and tools to manage intangibles. The study carried by the European Commission (2004b) provides a comprehensive review of the methods to manage innovation in the knowledge-driven economy: the Innovation Management Techniques (IMTs). IMTs are defined as "the range of tools, techniques and methodologies that support the process of innovation in firms and help them in a systematic way to meet new market challenges" (European Commission, 2004b; p.6). The report presents the following typology:

1. Knowledge management techniques
2. Market intelligence techniques
3. Cooperative and networking techniques
4. Human resources management techniques
5. Interface management techniques
6. Creativity development techniques
7. Process improvement techniques
8. Innovation project management techniques
9. Design management techniques
10. Business creation techniques.

However, based on these distinctive features previously mentioned, the direct implementation of managerial ideas traditionally used by the private sector in public organisations seems to be neither advisable nor particularly easy. Accordingly, they

need to be adapted to a greater or lesser degree to a non-market context before being implemented. On the same lines, the study carried out by Echevarría & Mendoza (1999) emphasize the idea that most management approaches should be adjusted to some extent in order to be successfully implemented by public organisations (see table below).

Table 3.1. Degree of Implementation of Different Managerial Approaches in the Public Sector

Management Approaches	Direct Implementation	Creative Implementation	New Conceptualisation*
Strategic Planning		■	
Management of Organizational Change		■	
Management by Objectives		■	
Management of Projects	■		
Services Management	■	■	
Marketing	■	■	
Operational Management	■		
Organizational Design	■	■	
Human Resources Management		■	
Financial Management	■		
Information & Technology Systems	■		
Management Control		■	

Source: Echevarría & Mendoza (1999); * Re-invention of the instrument given the specific characteristics of the public organisation

Although we are not aiming to review all the managerial approaches that public institutions are using to improve their internal management and their services to citizens, we outline some of the most widely used. By doing so, our purpose is to illustrate the growing importance of managing intangibles in public organisations, even if not always explicitly recognised. New considerations concerning information and communication technologies, quality, human resources, knowledge management and strategic planning are highlighted.

One of the most common and widely accepted management tools in the public sector over the last two decades has been the introduction of **Information and Communication Technologies** (hereafter: ICT), probably because, as suggested by Echevarría & Mendoza (1999, in López, 2003;), they need less adaptation and can be almost directly implemented to the public sector (see again table 3.1). With the

development of ICTs in the public sector, the notion of `e-Government´ (in some countries, like Spain, it is called `e-administration´) has emerged as an important tool for government reforms.

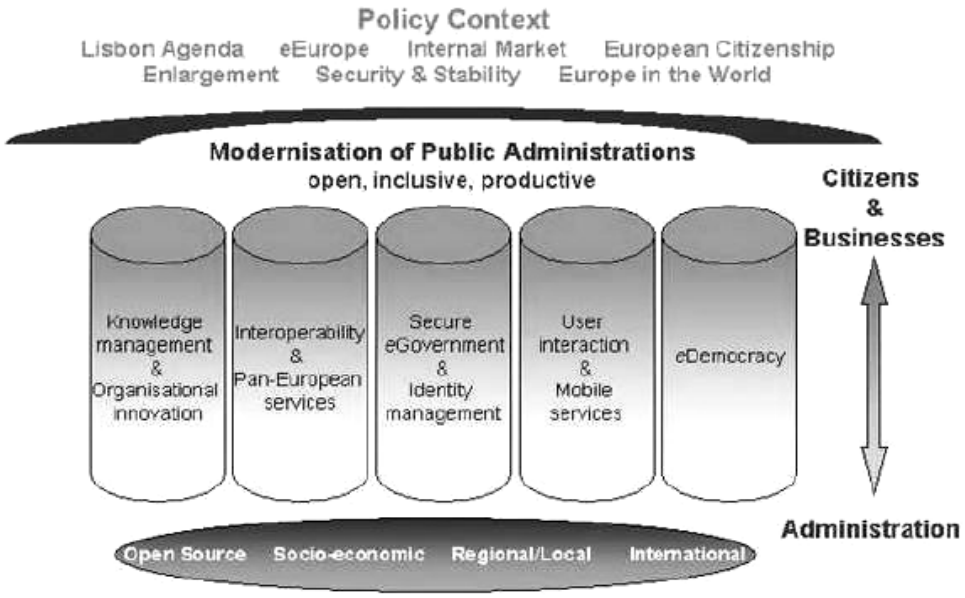
There are many definitions of the term `e-Government´. However, the most widespread and generally accepted are those coined by the OECD and the Gartner Group. The OECD (2003c; p.23) defines e-Government as "the use of information and communication technologies, and particularly the Internet, as a tool to achieve better government". According to the Gartner Group[21], e-Government is "the continuous optimisation of Government service delivery, citizen participation and governance by transforming internal and external relationships through technology, the Internet and new media" (cited in Merchán Arriba, 2003; p.38).

The concept of `e-Government´, therefore, refers to the use by government agencies of information technologies in order to improve government services, interactions with business and industry, citizen empowerment through access to information and facilitate more efficient government management. The expected benefits are (OECD, 2003a): the improvement in efficiency, quality of public services, greater achievement of, and contribution to policy objectives and building citizens' trust in their governments.

Being aware of the importance of using IT in the European public administration, the European Commission has developed the initiative *eEurope* in order to reinforce the use of IT in government agencies and in society in general. The first action ` *eEurope Plan 2002´* was designed within the Lisbon strategy framework and focused on increasing the use of Internet in business and among European citizens. The second `*eEurope Plan 2005´* was launched at the Seville European Council in June 2002 and its aims were twofold: (a) to promote the use the IT in the public administrations to provide better services (for instance, on-line education or services related to the health system) and (b) to create a dynamic business environment based on electronic transactions (known as eBusiness) (Castrillejo Hernantes, 2003). As the figure 3.1 illustrates, these actions are included in a broader policy context that aims at the modernization of public organisations.

[21] The Gartner Group is the largest company in the world in technology-related research and advice. For more information, see www.gartner.com.

Figure 3.1 E-Government and the Reform of the Public Sector in Europe



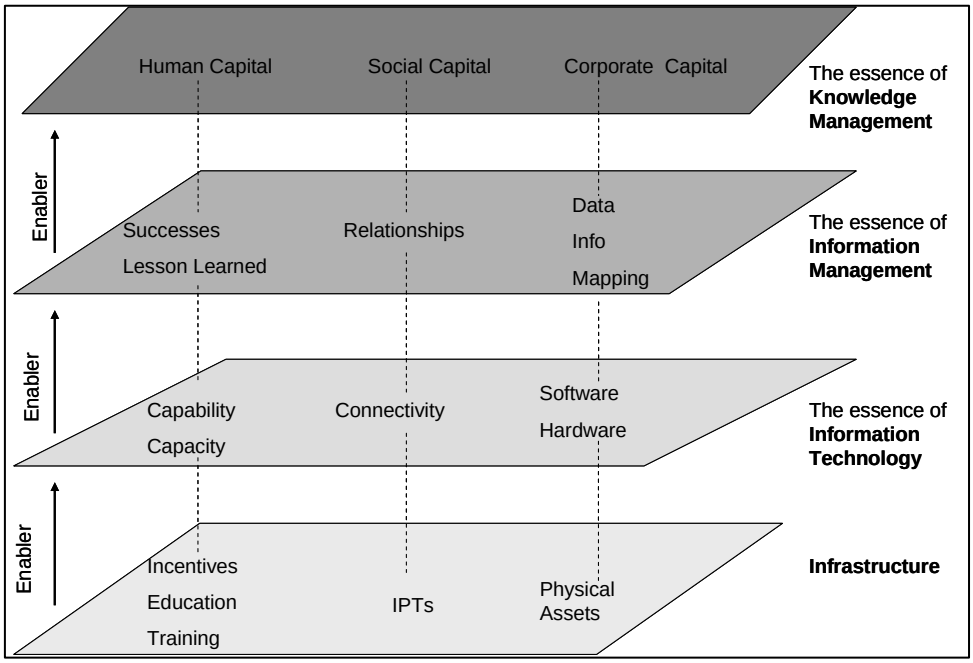
Source: http://ec.europa.eu/information_society/activities/egovernment_research/focus/index_en.htm

Although we do not deny the relevance of IT in improving the public services, the so-called `e-Government´ is not enough for a real strategic management of public intangible assets. As argued by the OECD "Information Technology (IT) is an enabler of human capital (by increasing workers capability and capacity), social capital (by allowing connectivity) and corporate capital (through hardware and software)" (OECD, 2001a; p.14). However, it is just one part of a good knowledge management strategy and will be of very limited use if ITC investments and changes do not take into account the staff incentive structure and the necessary ITC skills and training, the type of information available, public sector budgeting, and suitable ITC management and leadership (OECD, 2001b) (see figure 3.2). As this supranational organisation affirms, "the inability of governments to manage large public IT projects threatens to undermine efforts to implement e-Government" (ibid., 2001; p.1).

Another key aspect of the public sector transformation is related to the **management and conceptualization of human resources**. Today human resources are crucial for any kind of organisation, private or public, since tacit knowledge is embodied in people. The public sector, in accordance with the resource-based theory (Conner & Prahalad, 1996; Grant, 1996), is increasingly considering its staff as one of the most valuable resources in the organisation and source of sustainable competitive advantage. Indeed, legal reforms are taking place across Europe aiming at reinforcing flexibility

and meritocracy, and we are witnessing an important rethinking process concerning the traditional model of jobs-for-life in public institutions. As we will explain in chapter 4, HE institutions are a clear target for these policies.

Figure 3.2. Relationship of ITC, Information Management and Knowledge Management

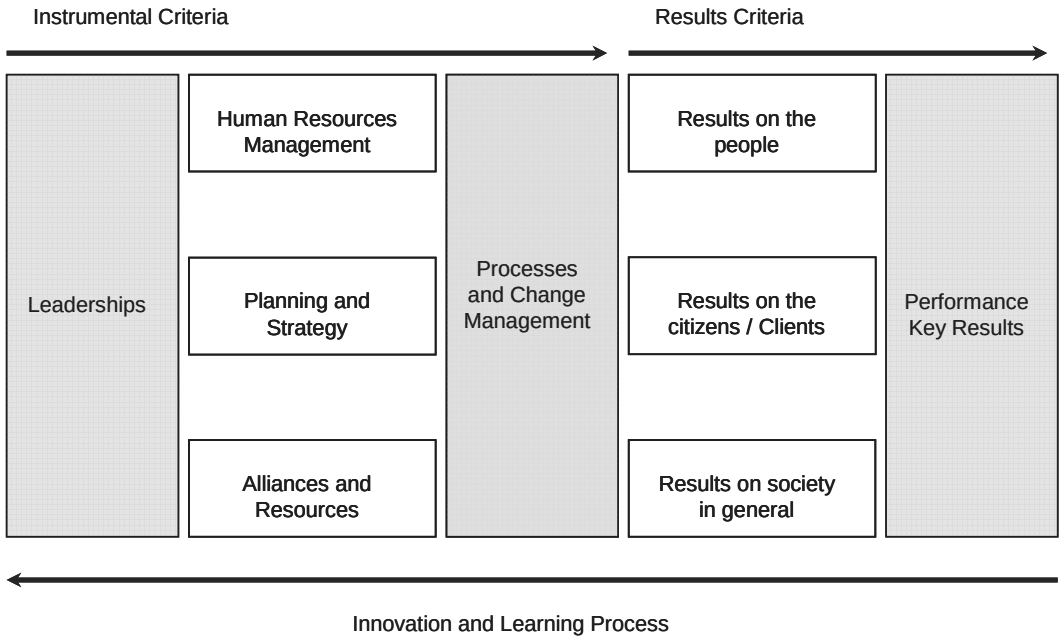


Source: OECD (2001a)

Significantly, another intangible asset that is being made a clear priority for public administration is the management of quality. For most European country Members, the quality policy applied to public administrations started in the 80s as one of the main pillars of the modernization process. In this context, the Common Assessment Framework (CAF) was developed. This tool was specifically designed to assess and manage quality in the UE-15 public sectors. It uses a common language and allows the various European public organisations to share experiences, good practices and make benchmarking analyses. Indeed, the CAF is available on-line[22] for all the public organisations that would like to apply it. This tool uses nine criteria (five instrumental and four results criteria) in order to analyse and assess the quality of the different activities and results of the public organisations (see figure below).

[22] See the European Institute of Public Administration for further details: www.eipa.nl.

Figure 3.3. Common Assessment Framework



Source: European Institute of Public Administration (2002; p. 6)

The IC models share some similarities with the quality management models. Both approaches help to make the organization's value creation process, the strategic mission and the intangible resources and activities visible. In our opinion, this tool could be considered as a preliminary step towards the IC models.

Finally, the concept of **strategic planning and strategic management**[23] started to be applied to public organisations at the end of the 80s. As defined by different authors, strategic management is about establishing a clear strategic direction, setting goals and objectives, and providing a guide to assess an organisation's performance (Grant, 1996; Gery & Kevan, 2000; Bueno, 1999; Joyce, 1999; Porter, 1999). Contrary to the tools highlighted before, this managerial concept does not attempt to better manage one particular intangible but the organisation as a whole. Indeed, the growing importance of this managerial instrument over recent decades in the public sector proves that these organisations are actually changing and transforming themselves. As pointed out by Joyce (1999), many leaders and top management in public organisations consider that strategic management is indispensable today for improving

[23] Note that although both concepts are sometimes used synonymously in public management, their meaning is not exactly the same. While `strategic planning´ refers to more stable contexts and considers it an exogenous variable, `strategic management´ is a management tool for more dynamic and complex environments and implies a more pro-active management approach, see Ansoff & McDonnell (1990) and Bueno (1999).

an organisation's performance, motivating employees, and leading the organisation in a particular direction.

It is interesting to note that the changing process in the public sector is less rapid than in the private one, since, as stated by the OECD, its "organisational changes have not traditionally been motivated by product competitiveness" (OECD, 2001a; p.10). Exceptionally, the OECD highlights the example of the military, which competes with the defence forces of other countries. Thus, the US Navy has put further emphasis on improving its intellectual capital through good knowledge practices because of "the realisation that the increased diffusion of knowledge within foreign forces threatened the superiority of the US Navy" (ibid., 2001; p.10). Nevertheless, in general terms, it can be said that the absence of a competitive environment is an obvious disincentive to adopting new managerial approaches (Bossi et al., 2005).

Furthermore, it is important to take into account that while strategic management in the private sector is about responding to the turbulence of the market and environment, in the public sector it is much more complex because it involves a political process as well (Joyce, 1999; p.164).

Empirical evidence shows that this trend towards strategic management has been more relevant in countries with an Anglo-Saxon tradition such as the UK, USA, Ireland, South Africa or Australia (Joyce, 1999)[24]. A study carried out in UK local governments (Flynn & Talbot, 1996; cited in Joyce, 1999), for instance, suggests that the vast majority of organisations have a strategic plan and that this instrument provides many benefits, among them: helping to define goals and objectives, facilitating better use of its resources and creating a unified vision of the organisation. Although this study affirms the importance of having a political framework which spurs strategic planning, it "may create lots of written strategic plans, but it is not assured that these will express any strategic thinking at all" (Joyce, 1999; p.7). It is, therefore, crucial that public institutions become truly convinced of the benefits of this instrument. Thus, its implementation will respond to internal motivation, rather than legal impositions, and will lead to a real learning process. In our opinion, this is the major challenge for both

[24] This author has identified four different models of strategic management and expounded some real examples in different Anglo-Saxon public organisations, for instance: the National Health Service in the UK has been required to prepare strategic plans since 1996; US federal agencies, since the 1993 Government Performance and Results Act; and all Ireland government departments, since the 1994 Strategic Management Initiative (Joyce,1999; pp.6-17).

policy-makers and academics. In order to make some progress in this issue, more case study analyses should be carried out with the aim of reporting best practices and encourage public organisations to reflect on their long-term activities and manage their affairs strategically.

Finally, within the strategic management logic, **knowledge management** is highlighted as a key tool for the long-term success of organisations. Today "there is little doubt that the increasing importance of knowledge in policy-making and service delivery can help to improve governance in the public sector by increasing the knowledge base and transparency of public activities" (OECD, 2001a; p.5). However, while the majority of private firms are making significant efforts to manage their knowledge, there is no such common practice in the public sector which seems to be lagging behind (ibid., 2001). Only certain leading public organisations are implementing knowledge management strategies. The next section will present some of the most outstanding examples across Europe.

3.1.3. The Relevance of Transparency in the Public Sector

The public sector modernisation process is also characterised by the increasing demands for transparent decisions. The specialised literature agrees on the idea that today transparency is a core principle in this new conception of the public sector.

The term transparency has been defined by different institutions and organisations in different ways (see next table). In this PhD, when taking about the term public transparency we refer to the OECD´s definition: "policies, institutions and practices that channel information in ways that improve understanding of public policy, enhance the effectiveness of political processes and reduce policy uncertainty" (OECD, 2003b; p.4). As pointed out by this supranational organisation, transparency in the public sector should not constitute a final goal in itself but an instrument to achieve more important ambitions such as raising welfare or promoting efficient and effective governments.

The OECD has been working intensively on the issue of public transparency as it is considered crucial for effective public governance as well as economic development

(ibid., 2003b). Furthermore, it is essential when attracting international investors[25] and an important ingredient in good public governance.

Although the idea of transparency was widely accepted decades ago in the business community, the public sector is still working on it. Despite evident progress being made in enhancing this sector's transparency, there is still considerable room for improvement in both transparency practices and policies in OECD and non-OECD countries (OECD, 2001a).

Table 3.2. Definitions of Transparency

- **Political science dictionary** (Brewer's Politics): "openness to the public gaze" (in Florini (1999)).
- **Business consultancy**: "the existence of clear, accurate, formal, easily discernible and widely accepted practices" (Price Waterhouse Coopers 2001).
- **OECD Public Management**: "the term 'transparency' means different things to different groups (of regulators). Concepts range from simple notification to the public that regulatory decisions have been taken to controls on administrative discretion and corruption, better organisation of the legal system through codification and central registration, the use of public consultation and regulatory impact analysis and actively participatory approaches to decisions making." OECD (2002a)
- **International Monetary Fund**: "being open to the public about the structure and functions of government, fiscal policy intentions, public sector accounts and fiscal projections" IMF (1998).
- **Draft Multilateral Agreement on Investment**: "each Contracting Party shall promptly publish, or otherwise make publicly available, its laws, regulations, procedures and administrative rules and judicial decisions of general application as well as international agreements which may affect the operation of the Agreement. Where a Contracting Party establishes policies which are not expressed in laws or regulations or by other means listed in this paragraph but which may affect the operation of the Agreement, that Contracting party shall promptly publish them or otherwise make them publicly available." April 1998, see: www.oecd.org/daf/mai/
- **APEC Leaders' Statement to Implement APEC Transparency Standards**: "transparency "is a basic principle underlying trade liberalisation and facilitation, where removal of barriers to trade is in large part only meaningful to the extent that the members of the public know what laws, regulations, procedures and administrative ruling affect their interests, can participate in their development (…) and can request review of their application under domestic law (…).In monetary and fiscal policies, (transparency) ensures the accountability and integrity of central banks and financial agencies and provides the public with needed economic, financial and capital markets data. (October 2002)
- **Monetary policy practitioners**: "the communication of policymakers' intentions with a view to enhancing their credibility" (Friedman, 2002); "the communication of policymakers' intentions" (King, 2000).
- **World Trade Organisation**: "ensuring "transparency" in international commercial treaties typically involves three core requirements: (1) to make information on relevant laws, regulations and other policies publicly available. (2) to notify interested parties of relevant laws and regulations and changes to them; and (3) to ensure that laws and regulations are administered in a uniform, impartial and reasonable manner. WTO (2002).

Source: OECD (2003b; p.21)

As we explain in the next section, IC approaches help organisations to increase their level of transparency diffusing IC information to stakeholders. Accordingly, our idea is

[25] According to the OECD Report (2002, p.18), the relationship between transparency (measured by the quality of institutional governance, an index of qualitative evaluations of the rule of law, the judicial system, enforcement, corruption, and shareholder and creditor rights) is clear and positive (in OECD, 2003, p.20)

that implementing IC models in public sector organisations can contribute to the general aim of boosting public transparency.

3.2. Emerging Recognition of Intellectual Capital in the Public Sector. Some outstanding initiatives

3.2.1. Rationale for using IC approaches

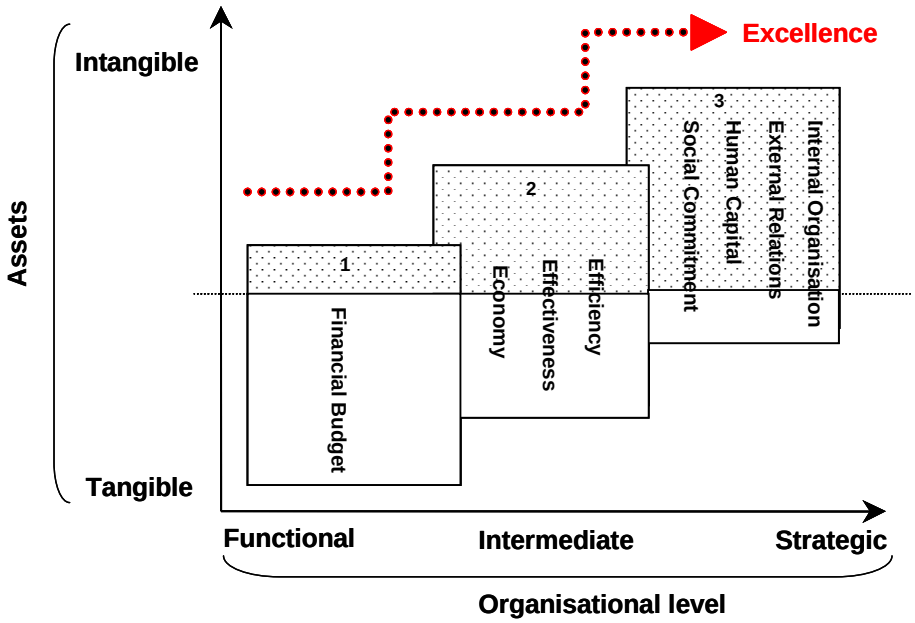
Before highlighting the main efforts at national and organisational level in applying IC approaches in the public sector, it is important to explain why we consider that these approaches have the potential to help identify and implement strategic objectives and improve the organisation's performance and transparency.

As argued in previous chapters, IC approaches have emerged 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 and that their products and services carry no price, IC approaches were initially understood as having no role to fulfil in the public sector.

However, it can be affirmed that the level of intangibility of the public organisations is very high. As pointed out by Bossi e al. (2001), the objectives of public entities are often non-monetary and cannot be defined in relation to their market value; the main inputs used by these organisations are human resources and knowledge, i.e. intangibles; and the outputs are usually services, and thus, more intangibles than products.

Furthermore, in the new knowledge-based society public managers (no matter what kind of the public institution: education, health, cleaning services, etc.), are obliged not only to handle the traditional financial variables but also the quality of the services and, in the final stage, to move the organisation towards excellence. This figure illustrates the main aspects that the managers have to deal with and shows that the more strategic the issues, the more intangibles there are. In this way, managing intangibles has become crucial for public organisations (Bossi et al., 2001). Therefore, according to the authors, the "intangibility" of the public sector explains the increasing interest in IC approaches by public managers and academics (ibid., 2001).

Figure 3.4. Intellectual Capital Logic for the Public Sector



Source: Bossi et al. (2001)

Moreover, as Mouritsen et al. (2004) emphasize when reporting on the Danish public sector experiences, the implementation of Intellectual Capital Statements[26] involves an important learning process.

In contrast to the principles of NPM which focus on organisational performance and control, "IC `reinvents´ the public institution (…). It provides a language, a management control system and a communication device about how the public sector institution works to create value" (Mouritsen, et al., 2004; p. 389).

Summing up, given the new pressures for improving internal management and increasing transparency levels explained in the previous section, IC approaches can be a valid attempt to respond to these challenges. On one hand, IC models include a review of the organisation's vision and mission, its strategic objectives, performance and results, which provide public managers with the necessary tools and information to better govern public institutions. On the other hand, IC Statements can be used as a communication device. Hence, better information can be disclosed to stakeholders

[26] For more detailed description and benefits of the IC Statements or Reports, see Chapter 5, section 5.1.1.

which will favourably influence relations between the public administration and society as a whole and, simultaneously, increase public transparency.

Based on these ideas, the rationale for using IC approaches particularly in public universities and research centres will be justified in detail in chapter 5 of this PhD Thesis.

3.2.2. Initiatives for Measuring Public Intellectual Capital

As mentioned before, numerous studies analysing IC and intangibles are related to private firms, while little emphasis is given to non-profit making organizations. An in-depth review of the literature indicates that IC approaches and terminology are still not widespread in the public sector. However, despite the novelty of this approach, public managers seem to be aware of its importance and, during the last decade, an increasing number of individual public organisations have been making considerable efforts to identify, measure, manage and disclose intellectual capital.

This section shows that, even assuming that firm-level experiences could be useful in formulating public management models, new models and designs addressing the specific needs of these kinds of organisations are needed. Examples in hospitals, cultural institutions or regional and local governments illustrate this necessity.

3.2.2.1. General Approaches to IC in the Public Sector

In addition to the guidelines described in the previous chapter, in attempting to design IC models that can be generally applied to the public sector, other examples may be quoted. In this section we highlight two of the most recent initiatives developed in Spain: the SICAP Project (2001-2003) and the general IC model for the public sector developed by Bossi (2003).

The SICAP Project, co-funded by the Spanish Ministry of Science and Technology (PROFIT Programme) and European Regional Development Fund (ERDF), have developed a general IC Model specially designed for public administrations and a technological platform to facilitate efficient management of the public services. Two pilot

experiences for implementing this IC model were developed in the Institute for Fiscal Studies[27] (Instituto de Estudios Fiscales) and in the Taxation Agency[28] (Agencia Tributaria).

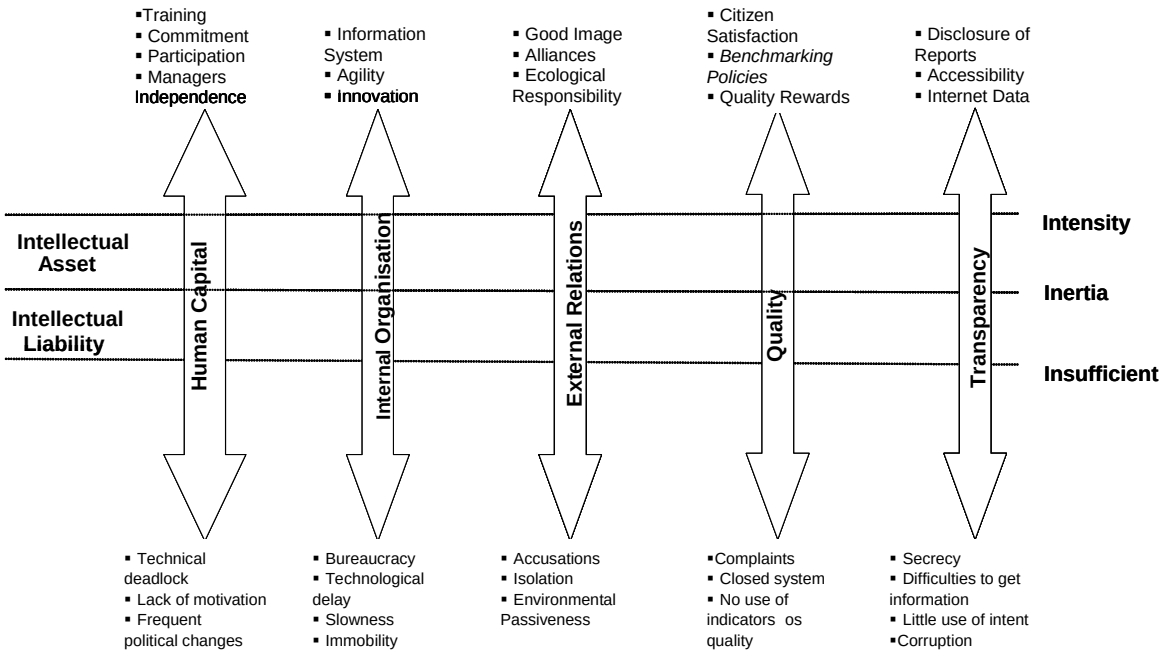
Finally, Bossi (2003), in his PhD research, built a general IC model specially adapted to public organisations. This model follows the general tripartite taxonomy of IC: Human, Structural and Relational Capital, and includes two new aspects that are especially important for the public administration: Quality and Transparency. The main contribution of this model, in our opinion, is the inclusion of the concept "*Intellectual Liabilities*". The author defines it as "the lack of Intellectual Capital presented by an institution" (Bossi, 2003; p.212). In this way, it is argued that most of the models and analysis undertaken by and for private companies focus on the added value of well-managed intangibles, but do not explicitly refer to the effects produced by a lack of intangibles management. Following this line of thought, and taking into account that transparency on the use of public funds should be a priority for public organisations, `Intellectual Liability´ becomes essential for the effective management of public intellectual capital.

Figure 3.5 illustrates the aforementioned variables. The arrows show, on one hand, the goals pursued by public organisations (above the arrow), and, on the other hand, the likely results of inadequate intangibles management (below the arrow). In addition, the figure incorporates three horizontal lines that represent the degree of IC management: *intensity*, meaning outstanding IC management; *inertia,* which implies a mediocre level; and finally, *insufficient*, when the IC management is neglected.

This model was conceived as a general approach to public intellectual capital, so each public entity should adapt it according to its own priorities, goals and objectives. In line with this, the author has attempted to verify the adequacy of the model in a specific public entity, the National Audit Office, by defining a battery of indicators[29] for each of the five variables considered.

[27] www.ief.es/default_Ing.htm.
[28] www.aeat.es.
[29] For more information about the indicators selected, see Bossi (2003), Chapter 6, pp.203-259.

Figure 3.5. Intellectual Capital Model for the Public Sector



Source: Bossi (2003; p.209)

3.2.2.2. Different Initiatives within the Public Sector

Although the general models aforementioned could be useful for inquiring into the particular characteristics of the public sector, there are significant differences across the sector. Particular endeavours are, therefore, being made to look into the main functions of public organisations. Thus, we have felt it important to highlight different initiatives in hospitals, cultural institutions, local government, cities and nations.

Healthcare has been at the centre of an extensive public reform process that has affected the governance structure, organizational model, accounting system, internal process design and human resources' behaviour of hospitals. As pointed out by Hood (1995), they have been an important target for NPM policies with the aim of improving their accountability and increasing their autonomy by using contracting mechanisms, performance measures and cost reduction policies. In fact, the introduction of these managerial approaches in healthcare has characterized most European countries since the end of the 80s (Vagnoni & Castelleni, 2005).

The quasi-market model that characterizes healthcare in most OECD countries (see the case of Italy, UK or Australia) is pushing healthcare organizations' directors into managing competitive advantage variables, among them IC variables (ibid., 2005). Furthermore, hospitals are defined as institutions particularly knowledge-intensive since professionals need many years of training and expertise (Habersam & Piber, 2003).

As a consequence, these institutions have been particularly proactive in introducing, or at least looking into IC and knowledge management models.

With the aim of exploring the IC in hospitals, Habersam & Piber (2003) used two qualitative case studies in two different European countries following the tripartite taxonomy of IC described in the previous chapter. The first case study was a regional, medium-sized hospital of repute in the region of Veneto (Italy). The second case was a smaller regional hospital in Tyrol (Austria). Through interviews, the authors debated and analysed what categories could be included in each kind of IC. For instance, in both hospitals, human capital was basically centred on aspects such as education and training, professional experiences and abilities to put this knowledge into practice.

As a result of the fieldwork, the authors redefined the tripartite IC taxonomy including a new category: *connectivity capital*. The notion of connectivity, developed previously by Roberts (1999 and 2000), is used to refer to the necessary "glue" that links the other three capitals. The authors claim that "this new comprehensive framework for managing and measuring improves the understanding of IC in hospitals" (Habersam & Piber, 2003; p.23). Finally, they emphasized that the empirical data show that there is an awareness of IC in hospitals.

In another qualitative study carried out by Vagnoni & Castellini (2005), the IC in Italian public healthcare organizations was revealed by analysing a sample of five healthcare organizations.

Cultural organisations are another type of public organisation that seem particularly interested in analysing IC. These organisations operate in an environment mainly based on intangibles, taking into account both the resources exploited and the outcomes of their activities (Donato, 2005; p.2). As argued by the author, "the quality of the cultural/artistic production depends greatly on the capability of artistic and non-artistic personnel, as well as of the quality of the internal organisation. Furthermore, in

cultural organisations “the quality of the internal organisation is one of the most relevant factors since the activities are characterised by great complexity and little possibility of standardization” (Donato, 2005; p.6).

An empirical research carried out in Italian cultural organisations - particularly theatres, opera houses and museums- shows that there is a high degree of interest in IC in these corporations. This assumption is based on the idea that the response rate of around 85% of the full sample is indicative of the degree of interest.

Finally, local and regional governments have also started looking into IC. As stated by Viedma (2003), in the past, the vision, objectives, and goals of cities have been mainly determined taking into account tangible assets since they were assumed to be the main factors in determining wealth. However, in order to better adapt to the new knowledge paradigm, some local communities have initiated strategic plans although these often lack coordination and continuity since they are defined in accordance with the politics of one or another government. Significantly, “they lack an intangible assets framework that allows `navigation´ from the present situation to the future vision of the city” (Viedma, 2003; p.24).

To avoid this situation, some authors are working on managerial tools mainly based on the ideas of the Balance Scorecard (Kaplan & Norton, 1992) and the Navigator of Skandia (Edvinsson & Malone, 1997).

Although the Balance Scorecard (BSC) can be considered the first attempt to develop a managerial system including financial and non-financial indicators, in our opinion, and in line with the argument expounded by Bossi et al. (2001), the BSC should be taken as a model for strategic management in general, but not as specifically focusing on managing the IC of the organisation. Regardless of this, the tool has been introduced in some City Halls, as for instance Charlotte City (1994) (cited in Bossi et al., 2001) and in Saint Cugat del Vallés.

The possibility of adapting the Navigator (initially developed in the Swedish insurance company Skandia) to the governing of municipalities was proposed by Edvinsson and Malone in their book entitled “Intellectual Capital” (1997)[30]. Some years later, Viedma

[30] Cited in Viedma (2003).

(2003) developed a specific methodology for measuring and managing the IC of cities: *City's Intellectual Capital Model*, applying it to the City of Mataró (Spain). Two approaches are included in this model. The first which it is called '*Cities General Intellectual Capital Model'* considers the following phases: vision, core activities, core competencies, indicators, and intellectual capital (IC) categories. These IC categories cover the following variables: financial capital, human capital, process capital, market capital, and renewal and development capital. It is essentially based on the measurement and management of the intangible assets a city possesses. The second approach, which we call '*Cities Specific Intellectual Capital Model'*, includes the following phases: vision, segment demand, output, products and services, processes, core competencies, and professional core competencies. Its purpose is to measure and manage the intellectual capital of each of the relevant industry *micro-clusters* that exist in the geographical area of the municipality (see figures below).

Figure 3.6. Cities' General IC Model

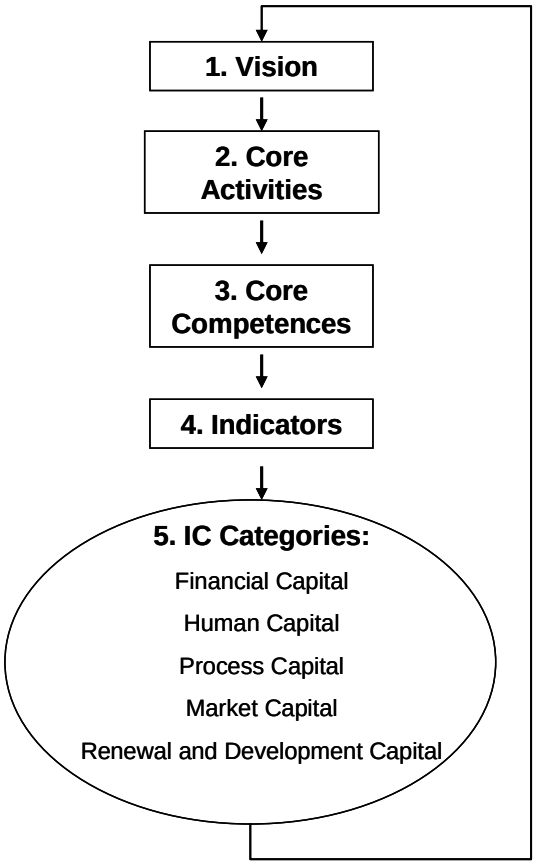
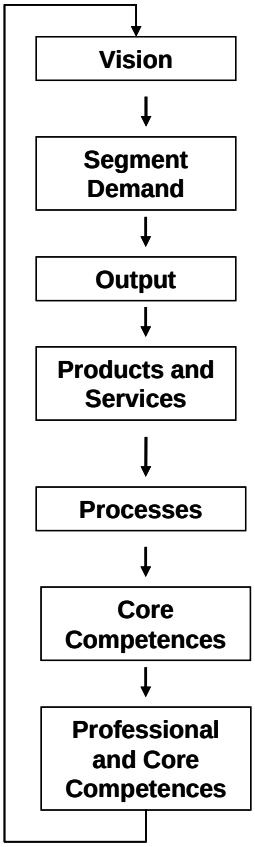


Figure 3.7. Cities' Specific IC Model



Source: Viedma (2003; p.8)

3.2.2.3. Macro-level approaches: Intellectual Capital of Nations

On a macro-level some efforts have been made to measure the `IC of nations´ or `regions´ in the belief that "only knowledge will give us the opportunity to create greater wealth of nations. So we need to develop the new map of knowledge assets and the IC of nations" (Edvinsson & Kivikas, 2003; p.164)

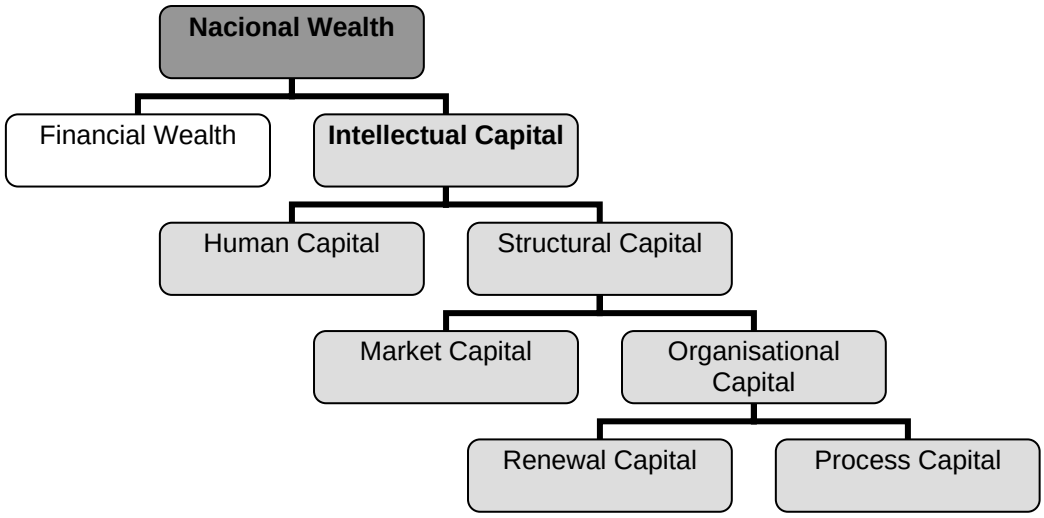
The most rigorous work in this field until now has been done by Bontis (2004) who defined `IC of Nations´ as “the hidden values of individuals, enterprises, institutions, communities and regions that are the current and potential sources for wealth creation” (Bontis, 2004; p1.4). Based on this work, Andriessen & Stam (2004; p.11) defined the term as “all intangible resources available to a country or region, that give relative advantage, and which in combination are able to produce future benefits”. Summing up, this concept applies the general principles of IC measurement and management, as well as a system of indicators, on a macro-economic level in order to make the hidden value of a country or region visible and to help governments to manage their intangibles resources. As stated by the World Bank (1998), “approaching economic development from a knowledge perspective – that is, adopting policies to increase a nation’s intellectual wealth – can improve people’s lives in myriad ways besides higher incomes” (cited in Bontis, 2004; p.14).

The most outstanding examples of models of measurement and managing the IC of nations are: the IC report of the State of Israel (Pasher, 1999), the IC Report of Sweden (Remble, 1999), National IC Index (NICI) for the Arab region[31] (Bontis, 2004), and the Intellectual Capital of the European Union (Andriessen & Stam, 2004).

The IC reports in both Sweden and Israel are based on the Navigator of Skandia (Edvinsson, & Malone, 1996). The NICI Model developed by Bontis (2004) is also based on Skandia Model but adapted to the peculiarities of the IC of nations. Thus, market value is national wealth, financial capital is financial wealth, customer capital is market capital, and innovation capital is renewal capital (see figure below).

[31] Initiative establish by United Nations

Figure 3.8. Navigator Model adapted to Nations



Source: Bontis (2004; p.15)

Given the European approach of this PhD Thesis, we have thought it is important to briefly highlight the approach and findings of the investigation carried out by Andriessen & Stam (2004) on the IC in the EU. Their main purpose was to make visible and measure the value of the IC according to the Lisbon Agenda's objectives. In order to achieve this ambitious goal, they developed a specific but simple model: the `IC Monitor for Nations´ (see figure 3.9). This matrix follows the widely used taxonomy of IC (Human, Structural and Relational Capital) but with an additional layer of classification incorporated in order to highlight the importance of assessing the country's performance over time. Accordingly, the concept of "assets" gives the perspective of the present, "investments" the future, and finally, "effects" provides an overview of the past. In each cell a set of indicators has been included[32].

Figure 3.9. Intellectual Capital Monitor for Nations

	Human Capital	Structural Capital	Relational Capital
Assets			
Investments			
Effects			

Source: Andriessen & Stam (2004; p.11)

Although, as previously explained, this taxonomy was developed with firms in mind, to make it applicable on a national level, the authors stressed the importance of "translating" the meaning of the three components to an aggregate level (Andriessen &

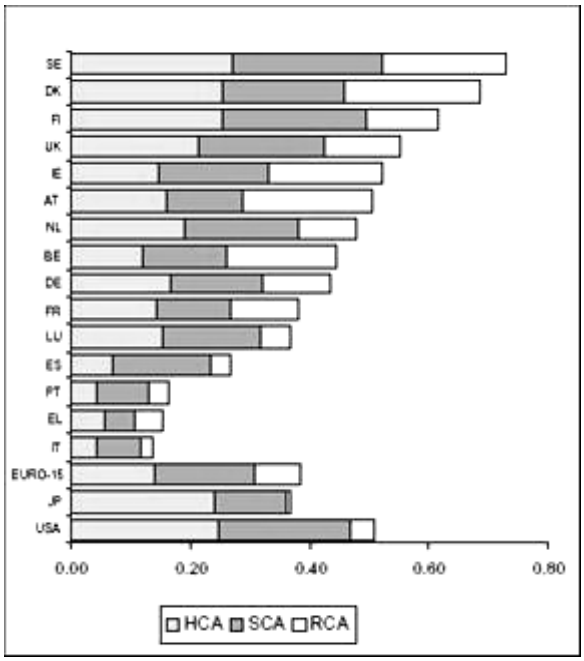
[32] See Andriessen & Stam´s Report page 12 for the complete set of indicators.

Stam, 2004; p.12). Accordingly, *Human Capital* represents anything related to people: knowledge, education and competencies of individuals in realizing national tasks and goals; *Structural Capital* refers to the "non-human storehouses of knowledge, which are embedded in its technological, information and communications systems as represented by its hardware, software, databases, laboratories and organizational structures" (Bontis, 2004; p.8), and, *Relational Capital* is related to the intra-organizational relationships and cooperative and coordinating capabilities of the organisations.

Following the above mentioned model, they analysed the growth of the IC in the EU-15 between 1999 and 2001 and investigated whether there is a correlation between the value of Intellectual capital and GDP. Related to the latter objective, they found a significant statistical correlation between GDP (per capita) and investments in structural capital (0.531), but, surprisingly, not with investments in human capital (Andriessen & Stam, 2004; p.23).

Figure 3.10. Value of IC of the EU countries*

Regarding the results when measuring the IC of the EU country Members, the Report concludes that it is possible to differentiate three groups of countries regarding their IC: the `leading´ group of Nordic countries (Sweden, Denmark and Finland); the group of `followers´ (Belgium, The Netherlands, Luxemburg, Germany, France, Austria, United Kingdom and Ireland), and the group of `laggards´ (Italy, Spain, Greece and Portugal) (see figure 3.10).



Source: Andriessen & Stam (2004; p.6)
*Value of IC assets for 2001

Lastly, regarding growth over time (1999-2001), comparisons show, in general terms, growth for almost all countries from the three perspectives: investments, assets and effects. However, as pointed out by the authors, if compared with its main competitors, the USA and Japan, the EU is still lagging behind.

Other significant initiatives and studies in this field are, for instance, the IC report of Croatia (Croatian Chamber of Economy, 2002), several IC reports in The Netherlands (EZ, 2000; EZ, 2002), the model of evaluation and measurement of IC developed for Bosnia & Herzegovina (Basic, 2005). Finally, at the regional level, Gallardo & Castilla (2005) reflect on the importance of intangibles for encouraging less developed areas, particularly the regions of Extremadura and Andalusia in Spain, and Lerro & Carlucci (2005) examine the relation between IC and improving the capability of a region to create value in the Italian regions.

It should be noted that experiences in research institutions and universities have not been included in this chapter since they are analysed in-deep in chapter 5. Actually, these institutions are the most pro-active in the public sector in managing their IC. As will be explained, there are several experiences being developed which have quite considerable impact on other practitioners and policy makers.

3.3. Concluding Remarks

The knowledge-based economy paradigm is forcing important changes in public institutions. In this new context, running the public sector within efficiency, effectiveness and transparency criteria has been, and still is, a priority for most OECD countries. In order to achieve these objectives, the introduction of managerial tools has been one of the main pillars of the public sector reforms and of the New Public Management doctrine. The IC models can be one of these managerial instruments.

In order to contribute to the answer of one of the research question previously defined: **what is the rationale behind recommending public institutions to identify, manage and disclose their IC?**, the main aim of this chapter has been to justify the importance of implementing IC models in the public sector as a potential answer to deal with the new challenges of the knowledge-based economy. Interestingly, in recent decades we have witnessed an increasing number of initiatives taken in public organisations, political efforts being made to develop IC guidelines and academic work being done in this field. After thoroughly reviewing the literature and analysing experiences in practice, we can draw some conclusions:

1. Regarding the high degree of "intangibility" of the public sector previously argued, IC can be a valuable tool to improve internal management and increase the level of transparency. The growing number of experiences at macro and organisational level in the public sector reinforce the relevance of this approach.

2. Despite increasing interest, it seems that public institutions are lagging behind private institutions in this field mainly because they do not operate in a competitive environment and there are few incentives to innovate in management.

3. The analysis of the empirical evidence illustrates that public managers are aware of the importance of managing their organisation's IC, although they are not familiar with the terminology.

4. The IC analytical framework developed for and by companies seems to be useful in analysing public intangibles. However, some previous adaptation to the characteristics of public organisations is required. Since the IC framework is more developed and consolidated today than one decade ago, public organisations are mostly following the general taxonomy of IC (Human, Relational and Structural capital) and the principles of the most widespread models, such as the Navigator of Skandia developed by Edvinsson and Malone (1997). While private organisations were developing their own IC models and classifications for years, this diversity of models is now hindering benchmarking analysis. Public institutions´ implementation of IC models seems to be more homogeneous and, as a result, it is expected to be potentially more "comparable".

5. As mentioned before, even assuming that firm-level experiences could be useful in formulating public management models, it is important to stress that, as argued in this chapter, private and public sectors differ in crucial aspects, and hence the effects of the pressure of the knowledge intensive economy on the public sector are not equivalent to those felt in the private sector. Moreover, note that "public sector processes and structures are designed not just to deliver more efficient services but also to protect deeper constitutional values such as equity and due process, which are all necessary to maintain public

confidence in government" (OECD, 2001a, p.20). This means that a new design addressing the specific needs of these kinds of organisations is required.

6. IC reports help to communicate with stakeholders and society as a whole on what the organisation is doing and how it is building resources and taking the necessary steps to secure success in the future (European Commission, 2006b). As regards private firms, the group of experts set up by the European Commission states that, IC reports "will provide a sound basis for improving the quality of the dialogue with financiers" (ibid., 2006; p.9). In the same way, the public sector needs to communicate with the private sector and with other partners and stakeholders. In this way, IC has the potential to clarify communication between both spheres of the economy by using a common language. Indeed, "communicating the outputs of policies will be at the core of the transformation of public organisations into learning organisations", (OECD, 2001c; p.5). It is, therefore, urgent, in our opinion, to have a common language to facilitate successful communication. We agree with the RICARDIS document in stating that the IC approaches can be an answer to deal with this necessity.

7. Both at firm-level and in the public sector, the implementation of IC models is on voluntary basis[33]. Only in Denmark, companies must disclose IC information "if this is a relevant aspect of their economic activity" (European Commission, 2006b; p.12). However, this requirement is rather vague and imprecise. The rest of the experiences highlighted were voluntary initiatives stemming from the interest of particular organisations.

Summing up, despite the advancement in IC management and disclosure in the public sector, further research would seem to be necessary. It is our aim to shed some light on this field by examining the impact of IC approaches in public higher education institutions and research centers. The following chapters discuss the challenge for universities in the knowledge-based economy and the rationale for implementing IC models in these organisations.

[33] Note that the Austrian IC Report is mandatory for all universities since January 2007. This issue will be developed in detail in Chapter 5, section 5.2.

PART II

NEW MANAGERIALISM IN THE HIGHER EDUCATION SECTOR: MEASURING AND REPORTING ON INTELLECTUAL CAPITAL IN EUROPEAN UNIVERSITIES

"*Europe must strengthen the three poles of its knowledge triangle: education, research and innovation. Universities are essential in all three. Investing more and better in the modernisation and quality of universities is a direct investment in the future of Europe and Europeans*"
European Commission (2005a; p.2)

4. THE UNIVERSITY OF THE 21ST CENTURY: NEW TRENDS TOWARDS MANAGERALISIM AND ENTREPRENEURIAL UNIVERSITIES[34]

Despite the fact that the specialized literature in the field considers universities key elements within the national innovation systems and recommends them to play an active role as knowledge producers, there is a lack of consensus about how these organisations should adapt to the new requirements of the knowledge-based economy; what is, or should be, their role in society, how they should be managed, or to what extent university-industry relationships might to be encouraged, have opened an intense debate. To this effect, questions mainly related to governance, funding mechanisms or assessment procedures are at the heart of the discussion.

By the end of the 90s, new controversial concepts such as managerial universities, entrepreneurial universities or "capitalisation" of research appeared. Regarding the novelty of these notions, the central purpose of this chapter is to define them and to analyse their impact on academic knowledge. Despite references to the United States (US) research system, it is important to note that we will focus mainly on the European Higher Education (HE) sector.

The remainder of the chapter is organised as follows. In Section 5.1 the different roles of universities over time are described providing a firm basis for understanding the

[34] This chapter was developed under the supervision of PhD Aldo Geuna during my stay at SPRU (Science and Technology Policy Research) during the period October 2005–March 2006, Sussex University, Brighton, England.

challenges that they are facing today. Presented here are the Humboldtian model, which is considered the main foundation for the modern concept of the European university, the social contract which defined science and technology policies during the second half of the past century in the US and the current evolutionary approaches. In Section 5.2, we examine the new ideas on HE institutions, such as managerialism or entrepreneurialism, and the main implications and potential effects on academic research. Focusing on the European HE and research systems, the main structural changes are described in Section 5.3. Finally, some remarks are highlighted.

4.1. Changes in Public Funding Rationale. Re-thinking the Role of Universities

4.1.1. Introduction

The two main functions of any university are traditionally held to be: (1) the generation of knowledge – research -, and (2) the transmission of knowledge – teaching -. However, empirical evidence shows that there has been an intensification of industry-academia relations in the past twenty years, mainly as a response to public budgetary stringency and because of the new role of the university in society. This new mission - conceptualised under the so-called `third mission´[35] or `third stream´ - refers to all those activities whereby universities can directly address social welfare needs and private or public economic objectives (Molas-Gallart, 2005).

Growing relations with external agents, mainly firms but also non profit making organisations, local government bodies, etc., is reinforcing the importance of universities and public research centers at regional level. In this way, since the end of the 80s the contribution to local and regional wealth and economic development has been considered an important role of HE institutions. Although this role is now receiving more attention than in the past decades, it is important to note that it is not entirely new to universities. Indeed, during the second half of the nineteenth century in the United States, the professed `land grant universities´ had as their most important purpose to serve the local community, particularly to meet agricultural needs and regional development (Mowery et al., 2004; Martin, 2003).

[35] For further discussion on “third mission” see Observatory of the European University (2006; pp. 125-169) and Laredo (2007).

These days, we could say that `multiversity´[36] – that is, the existence of multiple roles and missions embodied in a single university: schools for professional education, research institutions, centres for continuing education, etc. - characterises Western universities.

From the theoretical point of view, evolutionary approaches, mainly Mode 2 of knowledge production described by Gibbons et al. (1994) and the Triple Helix Model proposed by Etzkowitz & Leydessdorff (1996), attempt to conceptualise contemporary universities stressing their importance in the national innovation system.

In this section, universities and their changing role as knowledge producers are examined and also discussed is how changes in the rationale of public science are affecting them.

4.1.2. From Medieval to Modern Universities: the Post-World War Social Contract

Traditionally, medieval universities were considered as communities of scholars whose primary function was teaching, mainly in the field of law, theology and medicine (Malagón, 2005). In other words, their main function was maintaining and diffusing knowledge.

Over time, as societal needs and circumstances changed universities gradually adapted to the new demands.

At the beginning of the nineteenth century Humboldt University[37] was funded in Berlin to provide students with a broad humanist education under the idea of unity of teaching and research. This radical concept of university had a strong influence on the HE system over the next century and it was considered the main foundation of modern universities.

[36] The Workshop "Towards Multiversity: universities between national traditions and global trends in higher education" organised by the Institute for Science and Technology Studies of Bielefeld University (Germany), held in Bielefeld November 11-13, 2004, reflects the increasing interest in this topic. For more information see: http://www.uni-bielefeld.de/iwt/gk/multiversity.
[37] http://www.hu-berlin.de/indexe.html.

The so-called Humboldtian model rested on three essential pillars. First, it emphasised that universities would be involved, in addition to teaching, in research activities. In this way, universities evolved from the initial static idea of conserving and diffusing knowledge towards a more dynamic understanding of universities as organisations that needed to actively contribute to the creation of new knowledge. Nevertheless, teaching was still considered their main mission and hence research activities were undertaken mainly because they were crucial in providing better education (Martin, 2003; Malagón, 2005).

Second, it provided a clear idea about the role of the state in relation to higher education systems. This model emerged in the belief that governments bore full and exclusive responsibility for funding universities.

Third, and despite the significant reliance on public funds, these universities were characterised by a high degree of autonomy both at institutional level – a wide margin of manoeuvre to allocate resources – and at an individual level – academics were free to choose their research topics (Martin, 2003).

The above mentioned model can be categorised under the so-called `classical universities´, that is to say, universities whose main purpose was education and `knowledge for its own sake´ (Martin, 2003; p.14). However, the notion of university is not unique and different institutions evolved in different ways in order to satisfy socio-economic demands. Martin's (2003) analysis of the university landscape pointed to other `species´ of universities[38], known as "technical universities". The latter concept refers to institutions whose main goal is to disseminate useful knowledge and to train students with practical skills and competence.

Nonetheless, to understand the role of universities during the second half of the past century, it is essential to refer to the `social contract´ proposed by Vannevar Bush (1946). His influential report `*Science: The Endless Frontier´* - considered a key historical document heralding the transformation of the role of Federal State in Science and Technology (S&T) - tried to uncouple the link between science and the military, which characterised the pre-war and war periods in the U.S., introducing the idea that

[38] Note that Martin (2003) refers in addition to other "species" of universities, like the "land grant" universities mentioned before.

science could also be useful for wealth and economic development during peace time. However, Bush was partially side-lines as during the Cold War era the U.S. and the former USSR maintained enormous investments in military-oriented research (Mowery & Rosenberg, 1989).

The `social contract for science´ (Guston & Keniston, 1994) dominated this period until the end of the 80s. It described the relationship between Science and Government in which Science was assumed to provide basic research "performed well and honestly" (Guston & Keniston, 1994; p.2) while the latter assured the necessary funds. This idea was based on the deep-rooted belief that the State had the responsibility of funding scientific knowledge. In Bush´s own words, "government should foster the opening of new frontiers (…), since health, well-being, and security are proper concerns of Government, scientific progress is, and must be, of vital interest to Government" (Bush, 1946; p. 42).

Following Martin (2003), this implicit `social contract´ can be characterised mainly by four essential features: (1) the government has the responsibility to fund science, mainly in areas related to wealth, health and national security; (2) autonomy of science is crucial for the development of new ideas; (3) scientists should decide about which areas of science have to be funded, and, finally, (4) universities are the ideal place for basic research.

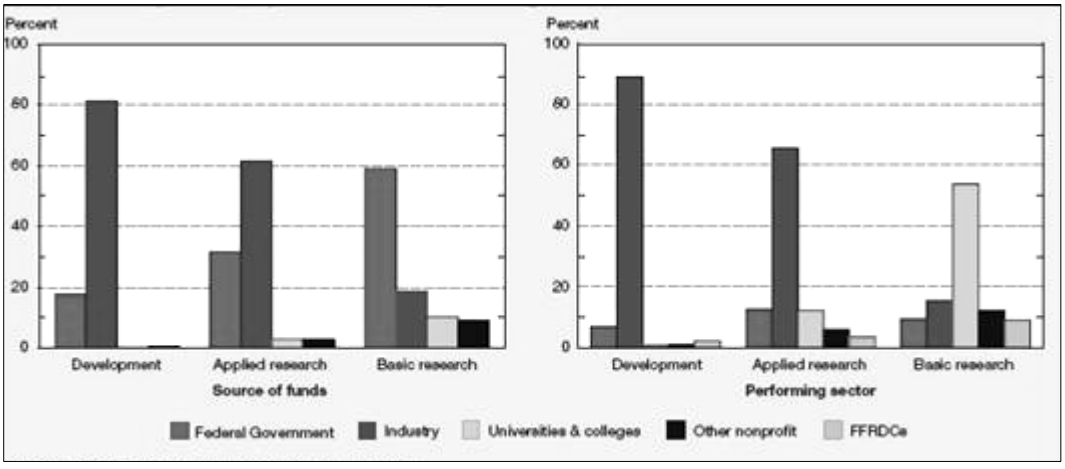
Analysing the historical context of the U.S. is essential in order to understand the development of this system in supporting scientific research. During World War II, valuable but also devastating scientific contributions, such as radar or the atomic bomb, helped to win the war, and at the end of the conflict it was understood that government should allow scientists to research providing them with the necessary financial resources. As Guston and Keniston (1994) argued "much of the impetus for continuing generous federal funding for science after World War II grew out of the military successes of research-based inventions. The Cold War made it imperative in the eyes of Washington not only to continue research and development of weapon systems but also to encourage basic research in areas that might ultimately prove militarily useful" (Guston & Keniston, 1994; p.15).

Following this line of thought, Bush's `social contract´ assumed a `science-push´ linear paradigm of innovation, in which the traditional notions of basic and applied research were clearly distinguished. Basic research was seen as the first step within the innovation process and, thus, as an input to commercial innovation. Bush (1946; p.52) pointed out that while basic research "is performed without thought of practical ends and it results in general knowledge", the function of applied research is to provide "complete answers". This view was widely adopted after 1945 and was used to justify substantial increases in governmental funding.

Following this paradigm, HE institutions were considered the best place for basic research. So investing in them assured success in innovation and development, and, consequently, contributed to future welfare. To some extent, current U.S S&T policies still reflect this linear idea of innovation, since, as showed by data, basic research is mainly funded by government and performed by universities (see figure 4.1).

Bush (1946) explicitly stated that universities and research centers should not only conserve the accumulated knowledge, but also contribute actively towards creating more. Hence, the `social contract of science´ was conceived in the conviction that freedom and autonomy were crucial elements for both the institution and its researchers in order to create new knowledge within the academia. Since private funding could divert scientists´ attention towards commercial interests, science should be publicly funded to assure a high level of autonomy (Bush, 1946).

Figure 4.1. U.S. Research & Developed Expenditure*



Source: National Science Foundation (2004)

*Source of funds and performing sector (2002)

Despite the strong role of the State, the final decision on which areas of knowledge would be funded was taken by scientists through the so-called `peer-review´ process. During this period, this mechanism became institutionalised and accepted as the way to allocate resources (Martin, 2003). It is still considered a suitable instrument and is widely used today. It involves an academic process used in the publications of papers, documents or manuscripts and in the awarding of funding for research. In this process, scientific works are assessed by experts in the field based on the idea of anonymity and reviewer independence. However, notice that while current socio-economic problems require transdisciplinary and multidisciplinary research approaches (Gibbons et al., 1994), `peer review´ systems are mainly disciplinary-based. Moreover, this system does not facilitate new approaches which dissent from mainstream theories. So that, a revision towards a more interdisciplinary and open system could improve scientific work and science credibility.

Summing up, the `social contract´ was defined basically by three tenets: (a) basic research was best done in universities; (b) there should be a high degree of autonomy in HE institutions and for scholars, and (c) peer review to allocate resources and guarantee the quality of publications should be institutionalised.

Finally, it is important to point out the traditional economic rationale for government investment in scientific research. From the empirical point of view, Nelson (1959) and Arrow (1962) established the main foundations for the economics of science, emphasising certain characteristics of scientific knowledge: *non-rival* – other agents can use the knowledge without detracting from the knowledge of the producers, *non-excludable* – other firms cannot be stopped from using the information, and *a public good* – the marginal costs of duplicating scientific knowledge are low and thus it is available, in principle, for all.

According to these features and the length of time devoted to basic research, these authors argued that firms (that usually have short-term investment perspective) therefore tend to under-invest in fields of research such as the smoking-cancer link, the ozone hole or global-warming. This is to say that if private companies have no

incentives to invest in this scientific research there is a market failure and the government should intervene[39].

However, as we will explain in the next sections, the rationale for research funding has changed over recent decades, forcing a rethinking process of the university's roles and its governing modes.

4.1.3. Revising the Social Contract. Main Changes

Although the `social contract´ was very successful, especially in the U.S. (Martin, 2003), we should note that the research fields selected under this model mainly reflected political priorities. For instance, defence, space and health in North America, or agriculture and energy in Japan.

Nevertheless, the end of transatlantic tensions and the rise of new techno-economic paradigms and problems, accelerating business transactions and indispensable institutional adaptation, provided the necessary impulse for a shift in the way private and public organisations regarded their research efforts. To this effect, at the end of the 80s, new ideas on science and government relationships started to emerge, replacing the post-war notion of the `social contract of science´ (Guston, 2000).

In addition, the end of the Cold War meant drastic downsizing of the military and weapons laboratories, which forced a reorientation in the funding priorities for basic research (Guston & Keniston, 1994). This was particularly relevant in the United States for physical sciences and engineering that underwent severe reductions (Martin, 2003).

Following Martin's argument (2003), three main driving forces can explain the changes forcing a revision of the `social contract´. First, increasing reliance on the idea that technology and innovation are key factors in improving productivity and competitiveness in a globalised knowledge-based economy. Second, important constraints on public expenditure pressure governments into establishing clear priorities in science. In this context of scarcity, it is increasingly important to justify public funds devoted to basic research, since areas like health, education or security

[39] The main foundations of the theory `economic of science´ are analysed in-depth in Geuna (1999) and Geuna, Salter & Steinmuller (2003).

have become political priorities in most OECD countries. Third, scientific and technological capabilities and competences become crucial in improving national levels of competitiveness, making the higher education system vital to develop skills closer to societal and economic needs.

In this changing context, Ziman (1987) explained, under the notion of `steady state´, the radical reorganisation of science that took place during the 80s in the United Kingdom (UK). In this process all the aspects of science, - including funding priorities, administrative procedures and career expectations -, were affected. Despite the author's focus on the UK system, some interesting results might be valid for other European countries.

The increased stringency in public budgets in relation to Research and Development (R&D) policies is discussed in the specialized literature as the main effect of the end of the Cold War. As a result, and he fact that R&D is considered one of the main sources of economic growth (Edquist, 1997) and a priority for industrialised countries, data show that public funding for basic research has been significantly reduced since the beginning of the 90s in most OECD countries (see table 4.1). Notice that in countries like France, the United Kingdom or the United States the percentage of general government expenditure dedicated to financing R+D decreased by 10% over the period 1991-2002.

Table 4.1. Percentage of Government Expenditures on R+D

	1991	1998	1999	2000	2001	2002	2003
France	48.8	37.3	36.9	38.7	36.9	38.4	-
Germany	35.8	34.8	32.1	31.4	31.4	31.6	31.9
Italy	49.6	-	-	-	-	-	-
Japan	18.2	19.3	19.6	19.6	18.5	18.2	-
UK	35.0	30.6	29.2	28.9	28.5	26.9	-
US	38.9	30.3	28.5	26.1	27.8	30.2	31.2
EU-25	-	36.7	35.5	35.0	34.7	-	-
OECD	35.6	30.7	29.7	38.3	28.8	30.0	-

Source: OECD (2004a)

Regarding funding of HE institutions, we discuss the fundamental changes that have occurred over the last twenty years concerning both the overall amount of resources devoted to universities and the funding allocation criteria.

Firstly, and in relation to the financial structure of universities, the OECD classification distinguishes five different sources of income:

- Total Government (TG) funds as the sum of Direct Government Funds (DGF) and General University Funds (GUF).
- Business, including funds and contracts with private firms.
- `Abroad´, category which includes foreign companies research contracts and European Union (EU) research funds.
- Private non-profit organisations (NPO), mainly foundations.
- Higher Education (HE) own funds.

Following this taxonomy, Geuna´s analysis (2001) of OECD data on university incomes in the period 1983-1995, reveals a significant decrease in relative terms in governmental funding in all the European countries analysed[40], compensated by an increase from other sources, mainly in the categories of `business´ and `abroad´ (see table 4.2) .

Table 4.2. Sources of Financing in HE Organisations for the aggregate of 7 EU countries (%)

	TG	GUF	DGF	Business	Abroad	NPO	HE
1983	94.0	68.3	25.7	2.9	0.6	1.5	1.1
1985	92.7	65.2	27.5	3.7	0.7	1.7	1.3
1989	89.9	60.2	29.7	5.4	1.4	2.1	1.2
1991	89.4	61.7	27.7	5.5	1.6	2.3	1.2
1993	87.7	60.1	27.6	5.8	2.5	2.7	1.4
1995	85.6	57.2	28.4	5.7	3.2	3.7	1.8

Source: Geuna (2001)

Even though these figures seem to show a radical change regarding university funding patterns, note that this analysis was based on aggregated data and, therefore, the specifics, history and national differences among countries are not revealed. Furthermore, it is important to note that governmental funds are still the main source of university income in most European universities.

In line with this, the CHINC Project[41] (2006) results of its quantitative analyses of almost 80 institutions across eleven European countries[42] for the period 1995-2003

[40] Denmark, France, Germany, Italy, The Netherlands, United Kingdom and Ireland. They represent about 80% of total HERD performed in the EU countries in that period.
[41] Changes in university incomes: their impact on university-based research and innovation.
[42] Czech Republic, Denmark, France, Germany, Hungary, Italy, Netherlands, Norway, Spain, Switzerland and United Kingdom.

stress the idea that there is not such a dramatic change in the structure of university funds. On the contrary, CHINC only found four universities which showed a decrease in total funding, and provide evidence that in the other HE institutions there has been, approximately, 3% real increase per year.

Concerning the European HE scenario, UK universities are the only exception in which the State is not the main funding source. For all other institutions, government funds are still the most important source, providing between 60% and 90% of total university incomes. As is argued in CHINC´s final report, one possible interpretation of these different results could be the fact that cuts in public funding occurred specially during the 80s. However, data show a clear general tendency in the period considered where the share of competitive grant and contract in total revenues is increasing.

Finally, the scarcity of data regarding private companies as a source of income for HE institutions hinders the analysis over time. However, when available, data show that of the institutions analyzed (mainly business schools and technical universities) private funds are crucial sources of income for only a minority (CHINC Project, 2006).

Secondly, and regarding allocation criteria, changes in the rationale for distributing public funds in Western countries are intensifying the level of competition, forcing universities to compete for public funds and, simultaneously, to search for alternative resources in the private sector. As pointed out in the CHINC Project (2006), shifting from mechanisms based on past university expenditures to funding systems based on the number of students (prevalent for teaching activities) or performance indicators (specially for research) was the main change affecting the assignment of public funds (CHINC Project, 2006).

Ranga et al. (2003) argue that this situation can be considered one of the main driving forces for the growing number of alliances between universities and firms, and for the increasing number of educational organisations engaging in the commercialization of research results.

Furthermore, during the last two decades there has been an increase in external requests for greater information about the use of public funds. Economic pressures were translated into financial demands, and an accountability culture has arisen in

order to justify not only the expenditures but also the outputs of these institutions –paid for through taxes -, and has induced “a more business-like attitude to institutional efficiency" (Ziman, 1987; p.26). As asserted by the European Commission, “universities have a duty to their stakeholders (students, public authorities funding universities, the labour market, society as a whole) to maximise the social return of the investment” (European Commission, 2003a; p.13).

A first consequence of the growing demand for accountability is that many governments and universities are enforcing mechanisms to assess research as a way to allocate resources on an efficiency basis, linking funding with performance (Geuna & Martin, 2003; p. 277). As these authors argue, a performance-based system of evaluation has advantages as well as disadvantages. While it is said that this mechanism is objective and meritocratic, and increases competition, efficiency and public accountability, it is also pointed out that this practice is labour intensive, highly cost and does not help to promote alternative approaches (Geuna & Martin, 2003).

Moreover, it is argued that since the criteria used to assess research performance have become more utilitarian, universities and research organisations have less autonomy to select the areas of knowledge in which they would like to work (Ziman, 1987). It is for this reason that the author referred to `utilitarian´ research as that which mainly responds to market values and priorities. However, if research priorities are fixed by national or European programmes (mostly Framework Programmes) the priorities are established according to scientific and political agendas.

For many scholars the main implication of these processes of change in science-government relationships is the emergence of strengthened and closer links between academia and industry, and the apparent necessity for commercialising academic results.

The latter argument has opened an intense debate about the benefits, or drawbacks, of this strategy on scientific knowledge since there is no empirical evidence that commercializing research outputs would lead to better and more efficient universities.
In the next section, the main theoretical approaches regarding the development of universities in the so-called knowledge based economy are presented and discussed.

4.1.4. Conceptualising the New Role of Universities in the Knowledge-Based Economy

Other interpretations of the new role of universities within the knowledge-based economy are provided by two evolutionary approaches: Mode 2 of knowledge production (Gibbons et al., 1994) and Triple Helix (Etzkowitz & Leydessdorff, 1996).

There is common consensus on the idea that the transformation of the knowledge production mode is one of the core processes that characterises the present socio-economic context. Changes in universities are directly influenced by this new conceptualisation of knowledge production. The linear model of innovation is no longer useful in a new context where the differences between basic and applied research become blurred, where universities are not the only institutions creating new knowledge, and where the traditional disciplines are not able to provide the solutions to present-day problems that are demanded by society.

In this scenario, some authors point out that knowledge creation modes turn to more comprehensive and open approaches responding to socio-economic, institutional and corporate needs. In contrast with the `Mode 1´, which operates within the linear paradigm, a new `Mode 2´ is defined by dynamic trans-disciplinary links between academia and industry and, according to `solution-focused´ and `design-oriented´ models, is characterised by a "constant flow back and forth between the fundamental and the applied, between the theoretical and the practical" (Gibbons et al., 1994; p. 19).

In this new production mode, the main change regarding universities is that knowledge production and dissemination are considered "no longer self-contained activities, carried out in relative isolation; they now involve interaction with a variety of other knowledge producers" (Gibbons, 1998; p. 1).

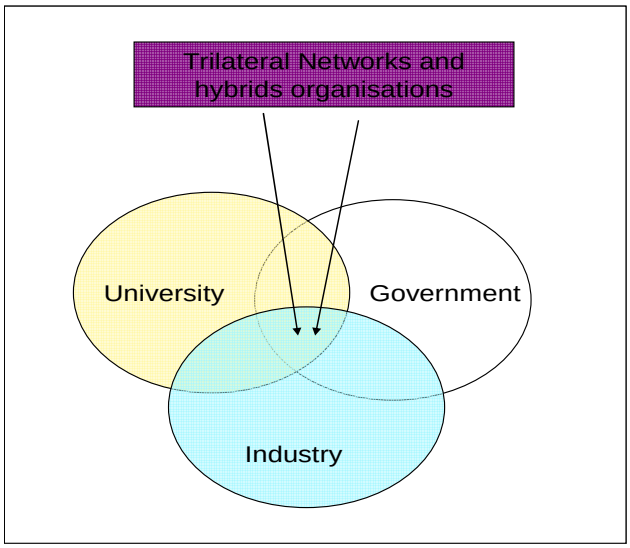
Despite the fact this notion of Mode 2 is mostly accepted in specialised literature, there are some critics who argue that it would be more precise and accurate to recognise that it is not a completely new context, "but rather a shift in the balance between the already existing forms of Mode 1 and Mode 2" (Martin, 2003; p.12). Indeed, as this author argues, applied research has been developed by universities since the end of the nineteenth century, mainly in the United States and Germany. With this in mind, the

distinction is rather a matter of considering Mode 2 more central nowadays than a century earlier (ibid., 2003).

Another approach directly linked to `Mode 2´ is the Triple Helix Model proposed by Etzkowitz & Leydessdorff (1996). In it University-Industry-Government relations are analysed "in terms of three interlocking dynamics: institutional transformations, evolutionary mechanisms and the new position of the university" (Etzkowitz & Leydessdorff, 2001; p.6). It is suggested that not only the relationships among actors are changing, but also that there are internal transformations in each institution. To this effect, hybrid institutions, alliances with companies, trilateral networks and new joint centers are being created to produce and disseminate knowledge (see figure 4.2).

National Systems of Innovation (Lundvall, 1992; Nelson, 1993) framework differs from Triple Helix postulates in that the former considers firms to have the leading role in innovation processes while the latter considers the three spheres as having equal importance in the innovation network (Etzkowitz & Leydessdorff, 1996).

Figure 4.2. Triple Helix Model



Source: Etzkowitz & Leydesdorff (2001)

Regarding the role of HE systems, this model assumes "that the university can play an enhanced role in innovation in increasingly knowledge-based societies". It is clear that if a knowledge-based economy is mainly characterized by the production, transmission and dissemination of knowledge, universities are unique in all these processes. However, this reinforced role within society also leads to a significant re-thinking

process of their mission (Etzkowitz & Leydessdorff, 2001), and, as a result, to the way they should be managed.

4.2. Contemporary Universities: The Emergence of Entrepreneurial and Managerial ideas in HE sector

4.2.1. Introduction

As was argued in the previous section, due to a reduction in public financial resources devoted to research, HE institutions are intensifying their relations with external agents, mainly private organisations, in order to find for alternative funds (Deem, 2001; Prichard, 1998). In accordance with this, the traditional role of the universities within society has clearly shifted from a socio-cultural perspective to an economic-oriented one (Amaral et al. 2003). Indeed, it can be affirmed that universities are being encouraged to increase their entrepreneurial spirit and to link their main task, teaching and research, to economic needs. Because of this, consultancy activities, technology transfer offices (TTOs), alliances with firms, spin-off companies, incubators, patents, licensing and other initiatives are carried out to establish closer links with industry.

In this changing context, HE institutions are forced to work in a more competitive environment, develop entrepreneurial activities, contribute to local wealth, and manage all these functions using efficiency and effectiveness criteria. However, they are also simultaneously subjected to quality assessment procedures to maintain academic and research standards (Amaral et al.2003).

All this has meant that since the end of the 80s, university-industry relations have become an important issue in the public-policy debate mostly regarding the repercussions and consequences of these partnerships on academic ethos, basic research, and teaching activities. It is because of this that the main effects of the so-called `third mission´ are controversial. According to Poyago-Theotoky et al. (2002), while an increase in the university-industry partnership could generate additional revenues for the institution and affect local and regional economic development positively, it could, at the same time, have a negative impact on the culture of `open science´ and on the types of research questions addressed and also oblige academics to spend less time on their teaching activities.

On one hand, some authors regard this new context as an important opportunity for universities and emphasise the positive effects of academia-industry cooperation. In line with this, `entrepreneurial universities´ are seen as a successful way to adapt to the new conditions. On the other hand, other scholars consider that this trend could lead universities to concentrate more on market-focused research, which could imply to move academia's shift towards utilitarian values.

However, there is general consensus in specialised literature on the idea that universities should introduce new modes of governance and internal management to adapt to the requirements of the context, and, thus, `new managerialism´ ideas are being implementing within universities and research centers.

In this section the new controversial concepts of new managerial and entrepreneurial universities are described, paying special attention to their main impact on academic research.

4.2.2. Increasing links with industry: becoming Entrepreneurial Universities? *Unintended effects on* academic *knowledge*

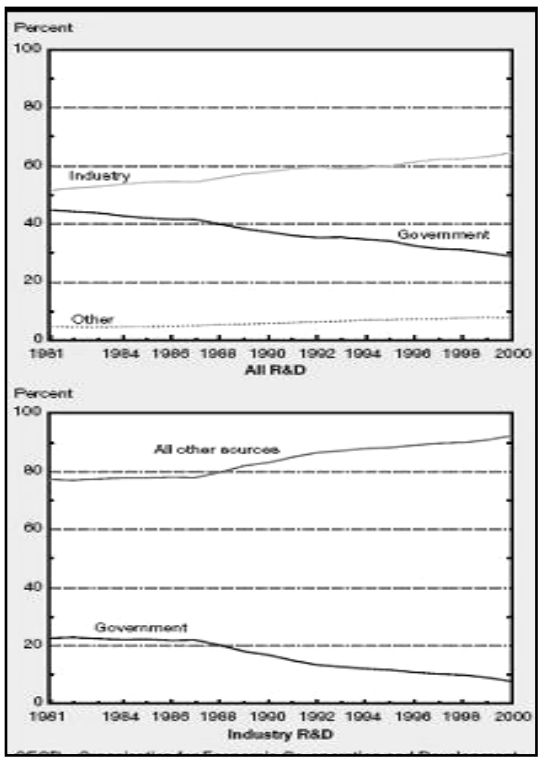
4.2.2.1. Academia-industry links as a desirable trend

Although industry-academia links are under current discussion in the science policy debate, it cannot be considered a completely new issue. Indeed, the origins of these links can be traced to the emergence of the chemical and electrical industries at the beginning of the 20th century when academics acted as consultants to firms, advising on corporate R&D (Freeman & Soete, 1997). In addition, the contribution of universities to economic development has been empirically demonstrated in some fields. For instance, Chandler's studies (1962, 1977)[43] indicated that the cooperation between academia, mainly technical universities, and chemical and electrical firms in Germany was crucial to the country's becoming a leader in the mentioned sectors, catching up Britain in less than 20 years.

[43] In Ropke (1998).

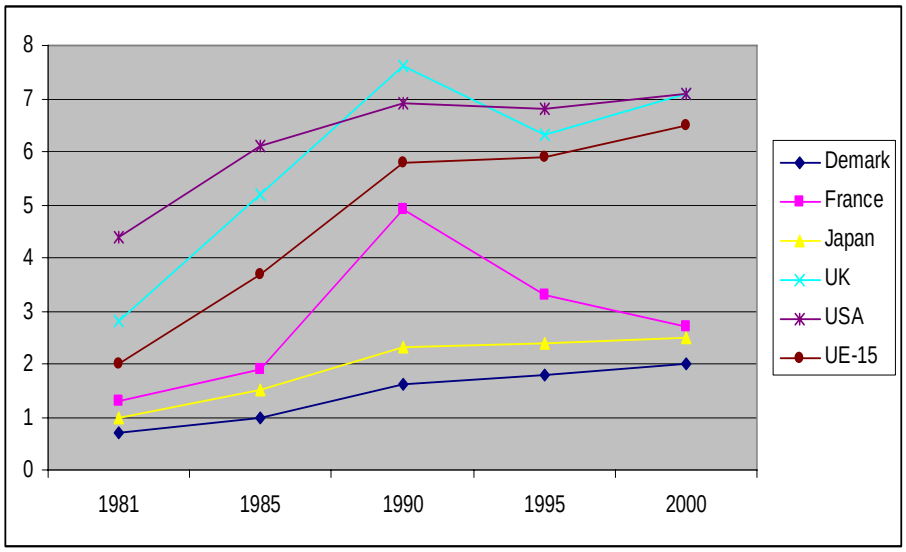
Figure 4.3. Sources of R&D expenditures OECD

However, in the last two decades academia-industry collaborations have been radically increased in most OECD countries and a significant indicator used to analyse this particular scenario is the percentage of Higher Education Research & Development (HERD) financed by industry. The data show that – especially during the 80s and 90s - the amount spent by industry on R&D in universities showed rapid growth while government funds were declining (see figures 4.3 and 4.4 the period 1981-2000).



Source: OCDE (2002c)

Figure 4.4. Percentage of HERD financed by Industry in some OECD countries



Source: Author based on OECD data (2005)

Table 4.3. Data of Percentage of HERD financed by Industry in some OECD countries

	1981	1985	1990	1995	2000
Demark	0,7	1	1,6	1,8	2
France	1,3	1,9	4,9	3,3	2,7
Japan	1	1,5	2,3	2,4	2,5
UK	2,8	5,2	7,6	6,3	7,1
USA (*)	4,4	6,1	6,9	6,8	7,1
UE-15 (**)	2	3,7	5,8	5,9	6,5

Source: OECD data (2005)

(*) Excludes most or all capital expenditure
(**) Most of the data are secretariat estimate or projection based on national sources

Nevertheless, it should be noted that these figures can vary according to the field (or areas of knowledge) and institutions. Pharmaceutical and engineering sectors are more likely to increase their links with academia, and the figures for certain prestigious universities are significantly high. For instance, in the United Kingdom, institutions like the University College of London, Imperial College, Cambridge or Oxford can capture from 15 to 20%, and in US, Harvard University can attract 25% of the total university budget (Faulkner & Senker, 1995).

This significant increase can be explained, simultaneously, by `supply push´ and `demand pull´ effects.

On one hand, it is argued that Western governments could not sustain the previous growth levels in public research expenditures (Faulkner & Senker, 1995), and that university-industry partnerships were being promoted because of important changes in S&T policies implemented during the 80s[44]. This shift has been particularly significant in the Unites States where the decline in the rate of technological innovation – mainly compared with Japan – forced a revision process of the national technology policy in order to maintain competitiveness levels (Poyago-Theotoky et al., 2002). Accordingly, several initiatives were developed in the U.S. to facilitate technology transfer processes within the national innovation system. Among others, the Bayh-Dole Act (1980) or the National Science Foundation – an organization which changed its internal policy to increase funding devoted to university-industry cooperation - promote technological diffusion and commercialisation of research

[44] For more detail about changes in technology policies in OECD countries see Poyago-Theotoky et al. (2002).

The Bayh Dole Act University and Small Business Patent Procedures Act (1980) was federal legislation which shifted the ownership scenario of intellectual property in U.S. This Act allowed universities to retain rights to any patents resulting from government funded research and to license these patents on an exclusive or non exclusive basis (Sampat et al., 2003).

A large number of scholars have considered the Act as one of the most influential changes in legislation, and the main catalyst for increasing technology transfer and commercialising academic results through university patenting and licensing activities. Nevertheless, more critical analyses based on detailed case studies and quantitative data suggest that there is not enough empirical evidence to support this conclusion (Mowery et al., 2004).

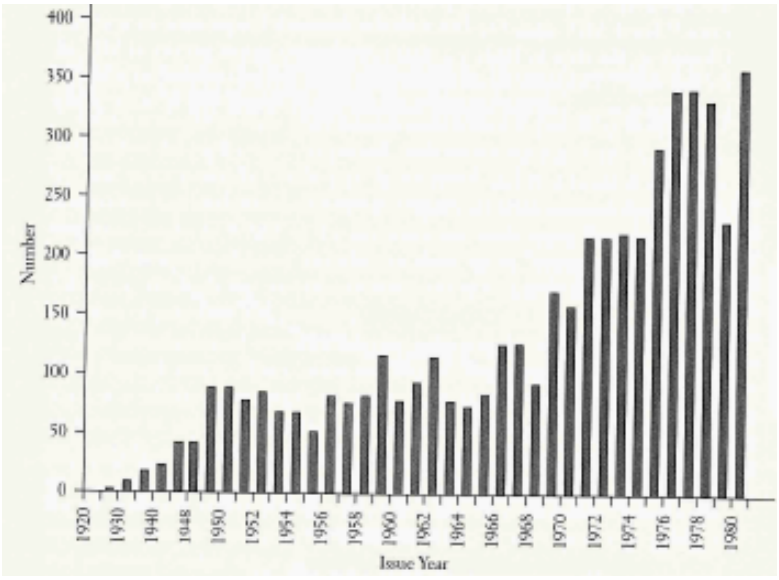
These authors analysed the evolution of U.S. university patent policies and university patenting before and after the Act (considering 1925-80 period). They state that the growing in university patents during the 80s and 90s could be attributed to a wide range of factors, and not only to the Bayh-Dole Act. Accordingly, the 1980 Act is considered one step more in a long reform legislation process in the US affecting the role of universities in patenting and commercialising of research which started during the second half of the last century (Henderson & Smith, 2002; Mowery et al., 2004).

Even though the Bayh-Dole Act might have accelerated the growth of patents during the 80´s, the trend was already established in the 1970´s so it in fact started before the Act (Mowery et al., 2004). The authors prove this by providing empirical data on the number of patents assigned by American universities in the years 1925-80.

As the figure illustrates, although the number of patents remained steady or even increased slowly from the 1930´s until the 60´s, it is in the 70´s when university patenting increased significantly.

Indeed, as pointed out by the authors, in the early 1930´s the debate on patenting and universities started (see the American Association for the Advancement of Science (AAAS) Committee of patents, or the Copyrights and Trademarks Report in 1934), and by the late 40´s “virtually all major US universities had developed patent policies” (ibid., p.42).

Figure 4.5. US University Patents (1925 -1980)



Source: Mowery at al. (2004; p. 47)

Furthermore, the increase of federal funds for basic research in US universities occurred during the 1960´s (more than a five-fold increment during the period 1958-68) also contributed to the university's greater involvement in patenting (ibid., p. 43).

During the 70´s, the most dramatic growth in university patents was witnessed. Mowery et al. (2004; p.53) attribute this situation to the following considerations:

- Increase in the number of private and public universities involved in patenting and licensing
- Growth in the role of universities (both, public and private) in directly governing their patenting activities.
- Increase of the inter-institutional dispersion of federal research funding, which reduced concentration of federal support in the top ten US universities.
- The success of paradigmatic examples, like Stanford University where a successful University Office of Technology Licensing (OTL) was created in the early 1970´s.
- And, finally, the importance of biomedical science. It is important to note that the greatest increase of federal funds occurred in biomedical science, a field of basic research of particular interest to industry. Accordingly, "the growth in biomedical research increased universities´ interest in capturing revenues from licensing biomedical patents" (ibid., p.44)

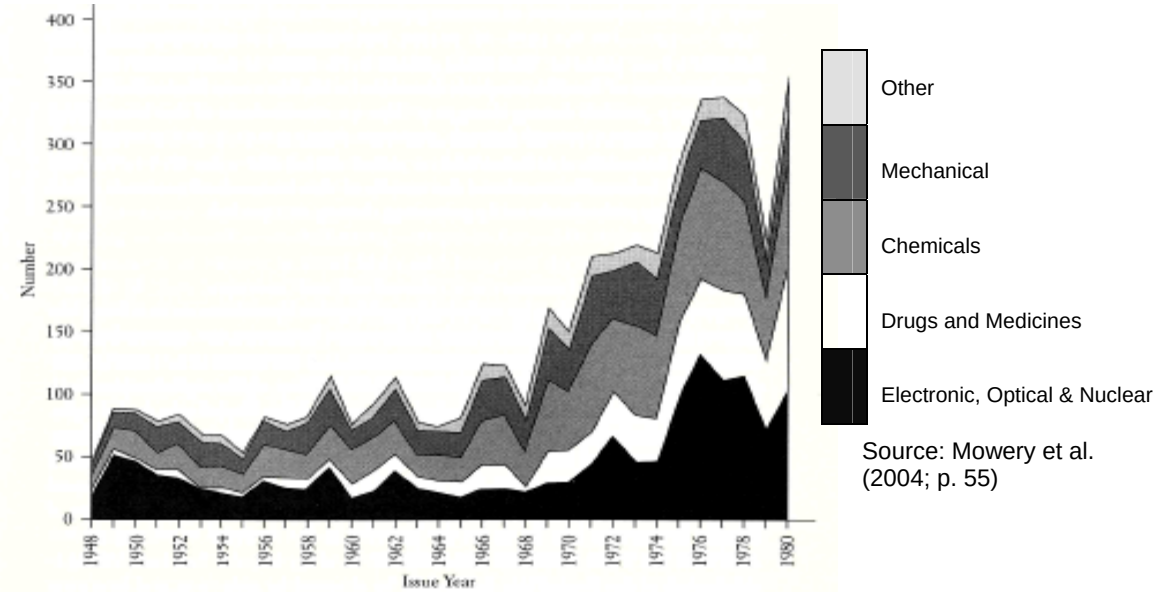
Further evidence is provided by the "patent propensity"[45] (defined as the ratio of total US university patenting in relation to total prior-year academic R&D expenditures for application, Mowery et al., 2004; p.48) in the same period (1925-80). The authors demonstrate that the trend of patent propensity growth is stable before and after 1980, so there is no evidence of a greater increase after the implementation of the Act.

Finally, regarding patents distribution in differing technological fields, it is argued that in specific fields such as drug and medical, electronic or mechanical, the increase of university patenting has been sustained since the mid-60s and the Act has not led to any radical change in this tendency. The next figure highlights the significant growth of patents in biomedical areas during the 1970´s.

Summing up, US university patenting has a long history and the Bayh-Dole Act, although important, is not the only, or the most important, factor.

Apart from the US, other OECD countries have developed initiatives and programmes in order to promote knowledge and technology transfer and to encourage links between industry and academia. Among others, we can highlight: VLSI (Very Large Scale Integrated Circuit) programme in Japan, ESPIRIT (European Strategic Program for Research and Develop Information and Technology), and EUREKA (European Research Coordinating Agency) programmes in the European Union.

Figure 4.6. US Patents Distribution in differing Technological fields (1948-1980)



Source: Mowery et al. (2004; p. 55)

[45] Patents (t) / R&D $ (t-1)

Besides governmental actions to promote these links, why else could universities be interested in promoting them with industry? There are a great number of reasons and incentives which encourage HE organisations to work more closely with business. The next table summarises the most relevant from both the institution and its students´ perspective:

Table 4.4. University Motivation for Closer Relationships with Industry

Reasons for the university as an institution	Reasons for students
▪ Obtaining alternative income for research ▪ Enhancing core competencies ▪ Access to new business and technology platforms ▪ Future consulting opportunities ▪ Better understanding of society's problems ▪ Enhancing regional economic development	▪ Getting financial support for students during their education (mainly in the form of grants) ▪ Providing learning opportunities for students through ▪ Providing opportunities to learn from real world experience (internships, professional training, etc.)

Source: The Author

On the other hand, `demand pull´ effects have to be taken into account. It is generally accepted that industry is also interested in university collaboration - mostly in high technology-based sectors - since they need access to major sources of new knowledge. In general terms, industry's main motivations to increase their ties with academia are: accessing research infrastructure located on university campus and research laboratories; accessing expertise and highly qualified professionals; gaining access to potential employees; expanding contacts for corporate labs; and ´leveraging´ internal research (Senker, 1990; López-Martínez et al., 1994).

As a result, a wide range of interactions between academia and firms are taking place. Although it is not the intention of this PhD Thesis to analyse in-depth all the possible forms of cooperation, the next table shows the most common ways of collaborating and some examples of how these relationships are implemented in practice.

Table 4.5. Types of Industry-Academia Collaborations

Type of Collaboration	Rationale	Example
Research	Many university-industry links are related to research activities, allowing firms to get access to researchers expertise or university facilities	▪ Joint R&D ▪ Contract R&D ▪ Research/science park ▪ Instrumentation and service facilities
Consultancy	Universities can provide companies with consultancy or other services	▪ Business / technical assistance ▪ Projects evaluation
Employment	Helping students to find an occupation and companies to find qualified employees	▪ Training projects ▪ Internship and exchange programs •
Entrepreneurialship	Universities can stimulate the creation of new firms or protect new entrants during the first phases	▪ Spin off ▪ Business incubators and physical space
Other informal Links	Forms of cooperation without any contract of formal agreement contract between firm and university	▪ Informal networks ▪ Meetings, conferences ▪ Informal consultancy works

Source: The Author

As is clear from the mentioned typology, when talking about industry-academia relationships we are mainly referring to only one of the HE institutions´ missions: research. Teaching activities are usually marginalised by this process. The OECD (1998) highlighted this fact in the taxonomy of types of collaborations, since only one of the categories refers to training.

4.2.2.2. What is an entrepreneurial university? Definition and characteristics

In this context of dramatic growth of university-industry relationships, the notion of `entrepreneurial universities´ emerged at the end of the 90's decade. Although this concept has been used widely in recent years, its definition, characteristics and implications on academic research are still blurred.

One of the most widespread definitions was figured out by Clark (1998). This author used the notion to refer to those universities that have developed a pro-active attitude towards the search for private funds through various enterprising activities (Clark, 1998). According to this author, and largely as a consequence of government budget cutbacks, universities defined as `entrepreneurial´ should set-up a "portfolio of third-stream income sources" (Ibid., 1998; p.6), which include industrial firms, local

governments, philanthropic foundations, intellectual property, campus services, student fees, and alumni fund-raising.

Clark based his definition on a cross-national study made, initially, of five paradigmatic universities in Europe: University of Warwick (England), University of Strathclyde (Scotland), University of Tweenty (Holland), University of Joensuu (Finland), and Chalmers University of Technology (Sweden). Although these organisations vary a lot in size, location, strategies and goals, throughout the study lasting five years, the author established a set of minimum characteristics or requirements to transform traditional universities into entrepreneurial universities:

a) The strengthened steering core. On this point the author pointed out the necessity for a "greater managerial capacity" (Clark, 1995; p.5), in order to steer universities in a more complex context and improve their flexibility to react to the changing demands.
b) The expanded developmental periphery. Clark's analyses highlight the fact that entrepreneurial universities include units working on knowledge transfer, intellectual property, fund-raising and other external links.
c) The diversified funding base. Understanding that governments are unable to cover university expenditure, it is vital for these institutions to broaden their financial base. Accordingly, they develop alternative income portfolios from firms, philanthropic foundations, royalties from intellectual property or campus services.
d) The stimulated academic heartland. Following Clark´s argument, the university as a whole should change, which implies changes in every faculty, department and unit.
e) Enterprising universities should embrace a strong culture of change which allows the institutions and the individual academics to work following these new organisational values.

Half a decade later, Clark (2004) re-analyses these case studies and extends his analysis to other universities worldwide: Mankere University (Uganda), The Catholic University of Chile, Monash University (Australia) and different North American Universities[46]

Even though Clark's notion is broadly accepted, in our view, his definition of entrepreneurial university seems to concentrate only on the attitude and capacity of the university to attract private funds. In our opinion, the complexity and novelty of the concept requires a more detailed analysis. We propose to analyse the following aspects when characterising universities as entrepreneurial:

(1) **Institutionalization of an internal economic and financial policy**. An entrepreneurial university should develop a specific internal policy to attract new private funds and resources at all levels (Rectorate, faculties, departments, research groups and individual researchers) to complement government funds. This would enable it to draw closer to the market and society as a whole in order to get recourses from business, donations, philanthropy, etc.

However, should all the funds from private sources be considered indicative of an entrepreneurial spirit? Regarding this point, authors like Clark (1998) even include as entrepreneurial activities all the campus services provided by the university which yield additional funds. That is to say, merchandising, shops, cafeterias, restaurants, sport services, etc. However, those activities are mostly related to the university life of students and teachers, and, in our opinion, should not be considered as a unique characteristic of what entrepreneurial spirit means.

Furthermore, even though most universities get funds from private sources, they are still mainly publicly funded (state, regional or local funds). Therefore, to know if a university can be called `entrepreneurial´ a more detailed breakdown of the university budget is required. In line with this, it would be crucial to analyse the structure of the budget in order to know how significant the portion of external funding is and what kind of external sources the university attracts.

[46] Stanford University, Massachusetts Institute of Technology, University of Michigan, University of California, LA, North Carolina Sate University and Georgia Institute of Technology.

(2) **Commercialisation of research results**. Although there are other ways for universities to get additional private funds, like those mentioned in the previous point, our argument is that commercialising research results is the core of entrepreneurial spirit. According to this, an entrepreneurial university should have a market activity through which it commercializes its academic results. This means explicitly that research activity seeks profit. The most relevant mechanisms for its commercialisation are usually: patents, licences, copyrights, and spin-off companies.
This market orientation should be a deliberate choice made by the university and explicitly defined in its strategic plan and mission statement. This implies an institutional decision and should thus be institutionally organised. In other words, it cannot be the result of an individual decision of a specific researcher or research group.

This idea is crucial in defining the university research profile taking into account for whom the research is done.

Accordingly, we can distinguish the following three:

- Academic orientation: research mainly done and focused on the scientific community.
- Entrepreneurial orientation: research organised and defined following market values and forces.
- State-government orientation: when research is mainly focused on solving the problems previously defined by governments.

Nonetheless, the research profile of the majority of European universities is hybrid, being a mixture of the above mentioned orientations.

(3) **Development of specialised structure** within the university to manage the knowledge and technology transfer activities.

In accordance with the entrepreneurial rationale, one of the main objectives of the university is to generate market oriented research. However, traditional universities do not have the capabilities and skills nor an organizational structure flexible enough to deal with the requirements of a business-oriented activity (or, at least, it should not be taken for granted). It is for this reason that the development of a specialised structure

has become a necessity in universities which want to start commercialising their research outputs.

In general terms, the concept Technology Transfer Institution (TTI)[47] is meant to encompass the different organisational structures devoted to transfer technology and other kinds of knowledge from universities, or other research centers, mainly supported by public funds.

They are considered the institutional channel through which the university engages with the market and society as a whole, and they are usually responsible for identification, protection, marketing and licensing of intellectual property developed by the university.

The European Commission (2004a; p.10) defined them 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. TTI´s 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 Intellectual Property Rights (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".

Despite the fact the TTI´s mission can vary depending on the context and the local environment, its main objectives could be summarised as follows:

- Facilitating the commercialisation of research results
- Protecting new technologies or products via patents, copyrights or trademarks
- Assisting scientists and researchers in creating start-up companies
- Forging close links with industry

[47] Note that TTI is the general name adopted by these structures, but each country or even each university has its own name. For instance, in Spanish universities it is called the Office for Transferring Research Results (OTRIs - Oficina de Transferencia de Resultados de Investigación), in Sweden: Holding Companies, and in some American universities, like Stanford University: Office of Technology Licensing.

Regarding the complexity of managing university IPR, some authors claims that TTI´s should develop a code of conduct to deal with potential problems derived from the conflict of interest between the market and the public universities (Geuna & Nesta, 2006).

Successful examples of TTI´s and entrepreneurial universities, mostly from USA and UK (for instance, Massachusetts Institute of Technology or Stanford University in United States, or University of Cambridge or Oxford in UK), are broadly used in the specialised literature to illustrate the importance of becoming an entrepreneurial organisation and to justify the creation of a TTI. As stated by MIT Entrepreneurial Center (1997) on its web site: "(…) MIT scientists, engineers, and managers believe that it is not enough merely to invent a new product, concept or technology. The measure of success is global commercialisation and widespread acceptance of their innovation"

Trying to emulate these successful experiences, the number of TTI´s has increased rapidly in the last two decades, first in USA and more recently in Europe. However, it is important to note that the mere existence of TTI´s does not mean that the university is developing flourishing entrepreneurial activities, nor that these activities are being managed in the best way. Indeed, other factors should be taken into account to analyse the "prosperity" of entrepreneurial activities within academia. Among others, the geographic location of the university is crucial for a successful technology transfer process. Accordingly, Stanford University's location in Silicon Valley or MIT´s location in one of the leading high-technology clusters in U.S. (O´Shea et al., 2005) were identified as one of the most significant factors in explaining their success. For these reasons, although it is possible to learn form these experiences special caution is required when trying to replicate them in other contexts.

Further evidence points out that most TTI´s are not efficient and do not even produce a net income (Nelsen, 1998; Charles and Convay, 2001) [48]. As the Community Genet (2005) affirms "the vast majority of US universities do not bring in enough royalties to cover their office expenses".

[48] In Geuna & Nesta (2006).

Finally, as Geuna & Nesta (2006) specified in their analysis of the specialised literature on technology transfer activity in universities and research centers, this activity itself could have important positive effects on academia but the risk and cost involved when carrying on entrepreneurial activities should be taken into account.

Despite the fact that, in our view, TTIs are an essential feature of entrepreneurial universities, the potential problems derived from the commercialization of research results within the university are much more complex than the idea of technology transfer (Rappert & Webster, 1997), and its implications and effects on academic research are certainly controversial, as will be explained in the next sub-section.

(4) **Governance of the institution following new managerialism ideas**[49]

Changes in the orientation of research activity and in the university intellectual property rights necessary involve changes in the way the university as a whole, and particularly its research activity, is governed. Our feeling is that becoming an entrepreneurial university requires radical changes in the traditional governing modes in order to satisfactorily manage the organisation in a business-like way. Along the same lines, Rappert & Webster (1997) argued that to manage and reward academic entrepreneurialism, new regimes of governance within the university are needed.

Although being an entrepreneurial university implies including new governing procedures and following the new managerialism approach, it is important to state that being a managerial university does not imply being an entrepreneurial one.

4.2.2.3. Implications of increasing entrepreneurial universities: some controversies

The characteristics formerly described could provide a more accurate idea of what an entrepreneurial university is. However, we do not assume in advance that there are any positive or negative effects on academic research or economic development in this definition.

[49] As defined in the next section 4.2.3.

It seems to be generally assumed by most of the policy literature and by even most university managers that academia-industry collaborations and university entrepreneurial spirit have unequivocally positive impacts on research. However, these positive effects and advantages are presented without counting the costs and risks that an entrepreneurial initiative involved (Geuna & Nesta, 2006). Indeed, there is little statistical empirical evidence to quantify the long-term effects of the increase of university entrepreneurial activities or to evaluate the real global impact of a greater commercialisation of academic research (Geuna, 2001; Geuna & Nesta, 2006)

Some studies highlight that there is a trade-off associated with the increase of the academia-industry collaboration (Poyago-Theotoky et al., 2002; Senker, 1990). The main potential benefits and costs of these collaborations are summarised in the next table.

Table 4.6. Benefits and Drawbacks of an increase in University-Industry Relationships

Potential Benefits	Potential Drawbacks
▪ Additional revenue for the university	▪ Negative impact on culture of open science
▪ More rapid technological diffusion	▪ Negative impact on student/adviser relations
▪ Choices regarding technological emphasis	▪ Could reduce the quantity and quality of basic research
▪ Positive effects on curriculum	▪ Negative effects on curriculum
▪ Local/regional economic development	▪ Could affect types of research questions addressed
▪ Two-way knowledge transfer	▪ Academics could spend less time on teaching and services

Source: Poyago-Theotoky et al. (2002)

Fostering entrepreneurial activities within the HE system has opened an intense debate mainly focused on the implications and impact of those activities on the conceptualisation of research activity, especially relevant when talking about public universities and research centers.

Although it is not our aim to analyse quantitatively the impact of these increased relationships on academia, we would like to contribute to a more critical analyses of this topic highlighting some controversial issues. The controversy can be organised around four main groups of issues:

- **Conflict of interests**. In this category, the problem of how to reconcile traditional academic ethos and market ethics is discussed. Hence, some authors argue that academic ethos can be negatively affected by these intense relations with industry since firms and academia do not share the same values. In order to reflect on this issue, we should pay attention primarily to two important questions:

  (a) *Distribution of knowledge: secrecy versus openness*. While historically academic science has been characterized by the free flow of material, information and knowledge diffusion through conferences and congresses, firms work in secrecy in order to protect their competitive position on the market. Public universities and research institutions are supposed to work under the so-called `open-science´ model which, by definition, produces public goods that are freely available and generate positive effects on society (Geuna & Nesta, 2006).

  As argued by Rappert & Webster (1997), this debate is directly related to the acquisition and control of knowledge protecting it through IPR´s. In general terms, the authors distinguished two forms of property rights: (a) statutory, mainly patents and copyrights, and (b) non-statutory, through publications. Traditionally, academia has focused on the second form. However, as explained before, since the 80´s changes in legislation, - started in Anglo-Saxon countries -, have facilitated the devolution of rights and responsibilities to universities from central or regional governments to exploit their intellectual property in order to generate new resources to fund their activities. Nowadays, academia's growing interest in the commercialisation of the research results seems to be a generalised trend in Europe. As a direct consequence, for instance, national accreditation systems are considering patents, spin-off companies or copyrights as crucial elements when assessing the quality of research activity.

  Thus, the commercialisation of research results could negatively affect the idea of universities as "open suppliers of ideas" (Rappert & Webster, 1997; p.121), converting them into more closed organisations.

  (b) *Autonomy* of the institution and of their researchers and teachers. Regarding autonomy, the main question is, could researchers with industrial support be influenced by financial interests? Are they free to choose their own research topic?

Some authors affirm that the freedom of teachers to pursue curiosity-driven research is limited by the fact that they are following more utilitarian values (Ziman, 1987; Slaughter & Leslie , 1997; Campbell & Slaughter,1999).

- **Concentration of resources** in few universities. Even though university-industry alliances are assumed to be a generally desirable trend, we should take into account that the effects of this trend may be uneven. In keeping with this, some studies show that, for instance in the UK, 33% of the total university research income from industry was accounted for by only 6% of the institutions in the period 1996-97 (HEFCE, 1998)[50].

  Accordingly, the local positive effects produced by "the geographical concentration of scientific capabilities and the concentration of a large part of research resources in a few universities could be offset by the negative externalities imposed on the universities that are marginalized by this process" (Geuna, 2001; p.622)

- **Impacts on basic research**. The impact of entrepreneurial activities on basic research is one of the main controversies discussed in the literature, although there are few studies with statistical support (Geuna & Nesta, 2006). Two ideas should be considered:

  (a) *Disciplines close to the market versus disciplines with little influence on the market*. It is important to note that when talking about university-industry relationships it is not possible to assess the impact of these collaborations on the university as a whole as it is necessary to distinguish the different fields or areas of knowledge. Accordingly a virtuous circle is created in fields closer to the market, such as nanotechnology or pharmacology, which can attract huge resources from the private sector, while a vicious circle, in fields such as philosophy, art, literature, etc. that serve the social and cultural welfare, causes them to lose their market share (Slaughter & Leslie, 1997).

  In addition, a recent study developed in Norwegian universities in 2001 shows that those faculties with more funds from industry carry out less basic research that those with no private funds (Gulbrandsen & Smeby, 2002).

[50] In Geuna (2001).

(b) *Long-term versus short-term*. Another important effect on basic research is related to the incentives for short-term research created by the market. Market short-term orientation, and the ex-post evaluation research approach, do not encourage researchers to be involved in long-term projects since they require around four or five years to produce results. As Geuna (2001) affirms, one of the consequences of the closer university-industry collaboration is that "projects with a long-term horizon will be less likely to be performed" (Geuna, 2001; p.623).

- **Effects on distribution of time between teaching and research activities**. In general terms, and as a heritage of the Humboldtian tradition, professors at European universities have two main tasks: research and teaching. However, the distribution of time devoted to these two activities is based on individual values.

  Within the paradigm of entrepreneurial universities, as previously defined, research activity seems to be more profitable for universities as institutions and for individual researchers since more economic benefits can be generated. For that reason, it could be possible that teachers-researchers dedicate more time, in the long run, to research than teaching. In addition, and taking into account that performance assessment systems evaluate, and reward more research outputs than teaching activities, in practice, research is promoted in detriment to teaching and, as a consequence, to the student's training and education. As argued by Geuna & Nesta (2006), this situation could be a hazard to teaching quality.

  Accordingly, it can be assumed that the possibility of earning more, gaining recognition and improving one's CV through the commercialisation of research results "could greatly influence the behaviour of researchers" (Geuna & Nesta, 2006).

As we argue in this section, the debate about whether promoting entrepreneurial spirit in universities will or will not have positive effects on academic knowledge is still open. While current HE policy seems to assume that increasing entrepreneurial activities in universities have positive effects on academia, with some authors even affirming that higher education and research systems should mutate into entrepreneurial organisations in order to become real agents of innovation and regional development

(Röpke, 1998), we consider that this orientation should be looked at more closely since more research is needed to assess, quantitatively and qualitatively, its future impact on universities and, particularly, on research activity and priorities.

4.2.3. Governance of Higher Education Institutions: New Managerialism

As pointed out in previous sections, since the mid-80s reforming HE systems has become a priority on the political agenda of Western countries. The main driving forces above mentioned - economic (decrease of public funds for research), social (growing importance of accountability), and cultural (new mode of knowledge production) - produce a very complex context and have forced an intense debate about how these institutions should be managed (Deem, 2001). In this context, a new trend called “new managerialism” appeared.

In accordance with this discourse, traditional university governance modes are not really considered capable of running these organisations according to the effectiveness and efficiency criteria demanded by the new socio-economic context and, as a result, new managerial skills and practices are required (Amaral et al., 2003).

Despite the fact that the application of managerial ideas to HE institutions has created enormous controversy within the academia, in the specialised literature it is difficult to find a clear definition or a complete set of characteristics forming the notion “new managerialism”. Nonetheless, it is used to refer, on one hand, to the ideology of application values and techniques used in the private sector - mainly fostered by neo-liberal governments -, and, on the other hand, to the need for those market-oriented mechanisms in public HE organisations in order to provide universities with the necessary tools to improve internal management (Clark, 1998; Ferlie et al., 1996; Meek, 2003). In this sense, numerous scholars demand criteria of efficiency, effectiveness, excellence, etc. for universities (Deem, 2001; Villarreal, 2001; Braun & Merrien, 1999).

In this context, it is important to note that, even though some authors identify conceptual differences in the notions `management´ and `governance´[51], in this Thesis they will be used interchangeably.

A discussion of new managerialism in universities should be set in the broader context of New Public Management (NPM).

As a result of a general review of the specialised literature, in this PhD Thesis we propose a set of characteristics of what the concept of new managerialism implies:

(1) **Greater institutional autonomy to manage financial and organisational affairs**.

This concept refers to the university's margin of manoeuvre to allocate resources according to their priorities. For instance, in countries like Austria or Finland, universities receive the budget in a lump sum from the government and they can allocate resources according to internal strategic objectives.

Regarding the concept of `autonomy´, it is important to note that there are different interpretations of this notion when talking about universities. Following Pechar (2003), we should distinguish these three notions: (a) autonomy as academic freedom of individual academics in the sense that they can research the topics they decide on without intervention of the State or other organisations. This concept is defined in the Humboldtian tradition; (b) autonomy of the collegial bodies which can govern the academic life of the university without interference of the State or other institutions; and, finally (c) institutional autonomy to govern and manage not only the academic aspects but also administrative and financial affairs. When mentioning autonomy within managerial ideas we are referring to this latter notion.

However, some authors point out that `autonomy´ cannot be conceived in absolute terms but should be regarded "as a relational issue involving the balance of power between institutions and government, on the one hand, and between management and the academic profession within institutions, on the other hand" (Amaral et al., 2003; p.7).

[51] See Amaral et al. (2003; pp.11-12).

In general terms, we can say that European universities have gained a greater level of autonomy. As Norbäck (2000) stated, most European governments are delegating responsibilities and self-government to universities increasing their level of independence and changing from a "state control model" to a "state supervising model". As will be explained in detail in chapter 5, Austrian HE reform towards a greater autonomy is a paradigmatic example.

(2) **Professional management to govern universities**.

In line with these ideas, university internal governance should be run by a group of professionals (internal or external) with the managerial skills required.

Traditionally, university internal decision-making structures have been based on collegiate models, in which the governing body - selected from the most recognised academics – jointly with students and representatives of external bodies have taken decisions collectively. As Amaral et al. (2003) point out "the idea that academics are particularly gifted to manage their own affairs has been accepted over centuries" (Amaral et al., 2003; p.276).

Nowadays due to the mentioned `multiversity´ that defines universities, these institutions are considered to be more complex and, thus, new forms of university management need to be found. Professional management is claimed to improve internal management and increase autonomy (Pechar, 2003). Following on from these ideas, university governors will not have to combine academic, management and administrative work as in collegiate structures (Salminen, 2003).

These ideas mean a radical change in the way universities are organised and some are of the opinion that including professional managers could weaken the role of academics. However, Boer et al. (2005) point out academics are still playing a crucial role, especially through the peer review system which acts as a mechanism to allocate recourses.

(3) **The introduction of management mechanisms** to govern the university's internal affairs.

Current university internal structures and decision-making processes are being questioned since they seem somewhat inappropriate for managing contemporary universities. Accordingly, 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.
In practice, in most universities, these mechanisms have been "superimposed on older managerial practices" (Deem, 2001; p.11). For instance, the head of the department – mainly an academic position – now has now to deal with financial and organisational affairs.

Understanding the importance of managing our universities better, chapter 6 will analyse a European initiative – The Observatory of European Universities (OEU) – which is actively working to provide universities and research centres with the necessary tools and instruments for the governance of research activities.

Furthermore, in this Thesis we consider that **the introduction of Intellectual Capital approaches could be a suitable solution to deal with the new management requirements**[52].

(4) **Human Resource policy**. In most European countries, university researchers and professors were (and still are in many countries) civil servants with permanent positions. Due to changes in national legislation (for instance, Austria and Spain) university staff is increasingly regulated by private law contracts. In this new labour situation, employee performance assessment, mainly linked to research outputs, has become a critical instrument to foster excellence. Accordingly, the use of performance-linked rewards - in the form of financial incentives, bonuses and promotion -, enables universities to attract qualified human resources.

(5) **Influence of external stakeholders** on the university boards.

In accordance with managerial ideas, external stakeholders should become part of the university governance body, and be expected to have more active involvement in the decision-making process than in the past. This is because of their understanding of the importance of the university's links and their role in regional

[52] For further detailed see Chapters 6 and 8.

development. However, we can affirm that, at present, they are still only represented in a symbolic way within the university bodies. For instance, the Court of English Universities includes members outside the university representing the local community and other stakeholders. However, this body only meets once a year to receive the audited accounts and the university's Annual Report and may discuss any issue relating to the university. In the Spanish case, the so-called Social Council is the body in charge of monitoring the economic activities in universities and to promote university-society relations. Representatives of entrepreneurial associations, trade unions and professionals of recognised prestige are included in this Council. Nonetheless, in practice the Academic Council (Claustro) is the body which decides on strategic guidelines for human resources, academic and research affairs, and the financial budget.

However, regarding the application of these ideas, it cannot be generally assumed that HE institutions are adopting similar patterns. Indeed, in practice, at European level, there is a high degree of diversity. Amaral et al. (2003) highlight the "substantial diversity" across countries - which depends basically on national legislation and the historical, economic and social background -, and even the universities, themselves. In accordance with their analysis of national case studies, countries like France and Portugal still have a strong culture of collegiate while Norway, Austria or Holland are on the way towards managerialism. The United Kingdom is the paradigmatic case "where managerialism has emerged in its most virulent form" (Ibid., 2003; p.281).

In order to study these differences in European universities in-depth, the research project developed by Boer et al. (2005) compares the university governance mode in four countries - England, the Netherlands, Austria and Germany - through an analytical tool called "*governance equaliser*". This instrument is defined by five dimensions: state regulation, stakeholder guidance, academic self-governance, managerial self-governance and competition for scarce resources. The different combinations of each factor leads to a specific configuration of governance. The project reveals the importance of national characteristics, but, besides these differences, all the countries analysed have undergone significant change in their governance structure. The most radical changes have taken place in England and Austria.

On the same lines, Amaral et al. (2003) recognise, in general terms, two distinctive models regarding university governance: the European/Continental Model and the Anglo-Saxon Model. The Continental Model is mainly characterised by governments' having increasingly strengthened the level of institutional autonomy and loosening direct control of HE institutions, while the Anglo-Saxon Model is, primarily, focused on quality control and accountability measures.

Some voices warn that the academic ethos and `open science´ can be negatively affected by this tendency of introducing management procedures and culture into universities. However, there is no empirical evidence to support these ideas since few systematic studies have been undertaken to analyse the effects of these changes in the management system on the academics and the institution.

On the contrary, other authors argue that managerial philosophy should not be looked on detrimentally. In fact, Meek & Wood (1997) claim that strong management systems at institutional level could contribute positively to academic freedom and institutional autonomy.

Regardless, the concept of managerialism requires "more work in order to provide it with theoretical rigor and internal consistency" (De Boer, 2003; p.92).

4.3. Structural Transformation in European Higher Education and Research Systems

The previous sections analysed, in general terms, the changes that have occurred in the HE and research sectors in Western societies, focusing on the emergence of new conceptualisations of university and the unintended consequences of these changing processes.

In this section, we concentrate on the changes occurring at European level. In this scenario, universities´ role in the knowledge-based society is considered crucial (European Commission, 2003a; 2005b and 2006a). However, the European research and innovation policy framework presents a very complex picture where different initiatives are running simultaneously and forcing universities to cooperate (for instance

in order to get funds from the Framework Programmes) and to compete at the same time for students, researchers, teachers, funds, etc.

Within this new paradigm where knowledge and intellectual capital play a central role in the innovation process, the Lisbon Agenda (March, 2000) has aspired to making Europe "the world's leading knowledge-based economy by 2010". Barcelona European Council in March 2002 and the European Council of March 2005 re-launched the Lisbon strategy and are fostering universities as pivotal elements for reaching this objective.

If a knowledge-based economy is characterised by the production, transmission and dissemination of knowledge, universities are unique in all these processes, "due to the key role they play in the three fields of research and exploitation of its results, thanks to industrial cooperation and spin-off; education and training, in particular training of researchers; and regional and local development, to which they can contribute significantly" (European Commission, 2003a; p. 2). For this reason, the EU considers that "investing more and better in the modernisation and quality of universities is a direct investment in the future of Europe and Europeans" (European Commission, 2005b; p.2).

Our intention is not to detail all the initiatives and policies related to universities and research centers, but outline the two main on-going macro-policies which have been radically transforming the tertiary sector since the end of the last decade: the so-called "Bologna process" for homogenising teaching activity throughout European universities and the creation of the European Research Area (ERA). Although both initiatives are functioning separately so far, some scholars argue that cross-sector thinking is required to better understand the university context comprehensively. In this way, the European University Association (EUA)[53], - which is considered an independent voice representing both European universities and the national rectors' conferences to promote the development of a coherent system of European higher education and research -, considers that both political endeavours to introduce structural changes, improve the quality of teaching and strengthen research and innovation should be linked. According to this, it is suggested that, in order to succeed, efforts should be undertaken to secure links between higher education and research.

[53] As of 1 April 2006, EUA has 777 members in 45 countries across Europe. For more information see: http://www.eua.be/eua/index.jsp.

ln order to face these new challenges, European universities are immersed in the above mentioned "Bologna Process". This process, now involving 45 countries[54], began in 1998 with the Sorbonne Joint Declaration based on the initiative of four EU countries (France, Italy, Germany and United Kingdom). The Declaration stressed the idea that universities are a pivotal element for fulfilling the main aspiration of the European Union to be "the world's leading knowledge-based economy by 2010" (Lisbon European Council, 2000). That is to say "higher education plays a central role in the development of both human beings and modern societies as it enhances social, cultural and economic development, active citizenship and ethical values" (Sorbonne Joint Declaration, 1998).

One year later, the Bologna Declaration aimed at the establishment of a European Higher Education Area (EHEA) by the end of the decade[55]. Accordingly, the Declaration's objectives are to: adopt a system of easily readable and comparable degrees, adopt a system with two main cycles (undergraduate/graduate), establish a system of credits (such as ECTS), promote mobility by overcoming legal recognition and administrative obstacles, promote European co-operation in quality assurance, and promote a European dimension in higher education.

In the follow-up Conferences, where European Ministers of Education meet every two years to further discuss and assess the process, the objectives and action lines (Prague, 2001; Berlin, 2003; Bergen, 2005; and London, 2007). The social dimension of the Bologna Process is reaffirmed, and the idea that "higher education should be considered a public good and a public responsibility" (Berlin Conference, 2003) is emphasized.

Nevertheless, as Berndtson (2003) suggests, there is a danger that the changes proposed in these Conferences and Conventions might only be `cosmetic´. The author reflects on the effects of the Bologna process in the real organisation of European

[54] 45 countries participate in the Bologna Process and are members of the Follow-up Group: Albania, Andorra, Armenia, Austria, Azerbaijan, Belgium (Flemish Community and French Community), Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, the Holy See, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, the Netherlands, Norway, Poland, Portugal, Romania, the Russian Federation, Serbia and Montenegro, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, "the former Yugoslav Republic of Macedonia", Turkey, Ukraine and the United Kingdom (Communiqué of the Conference of European Ministers Responsible for Higher Education, Bergen 2005; p.6).

[55] Year 2010.

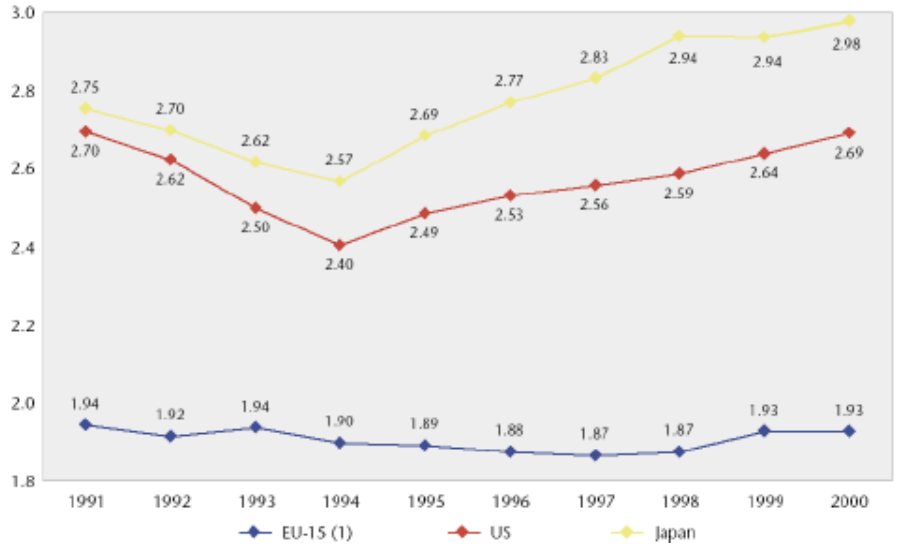
universities and warns about some problems that are arising within the reform process. In the light of this, his paper argues that the reform does not address the daily problems of scholars in universities. As he points out "the only problem within universities which is touched upon is a long duration of studies. Scarce resources, problems of mass education or the role of part-time faculty hardly figure in the reform process" (ibid., 2003; p.12). To avoid a "cosmetic" reform, it is important to understand that the Bologna Process will only be a reality with the joint commitment of national and European level institutions (Berlin Conference, 2003), and with the involvement of the whole university community.

On the research front, HE and research institutions are immersed in another transformation process: the creation of the European Research Area.

Research activities are being considered a central element in the knowledge-based society and economy (European Commission, 2000a). Although there is general consensus about research as an essential driving force for economic and social growth, indicators reveal that the dynamism of our countries is still inferior to our major competitors. Proof of this is that the European Union public research effort has fallen to 1.93%[56] of its GDP, against nearly 3% in the United States and Japan[57], and the gap in relation to the our main competitors during the period (1991- 2000) has also been widening. Furthermore, the EU has fewer researchers and European firms employ fewer researchers in comparison with its main competitors (see figures 4.8 and 4.9). In addition, the so-called "European Paradox", which illustrates that although Europe seems to play a leading global role in terms of scientific results, it is lagging behind in the ability to generate and exploit innovations (Dosi et al. 2005; p.1) and this is a major concern for the research political agenda.

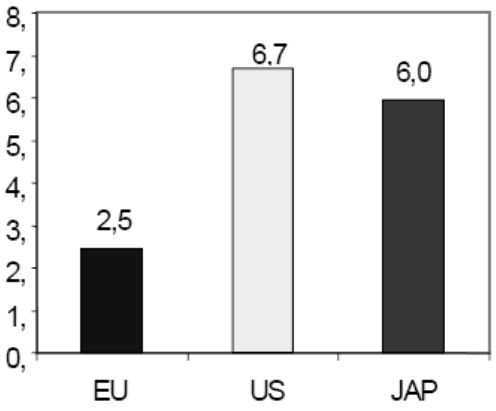
[56] EU-15 average
[57] Research DG, see Dosi et al. (2005)

Figure 4.7. Gross Domestic Expenditure on R+D as % of GDP (1991-2000)



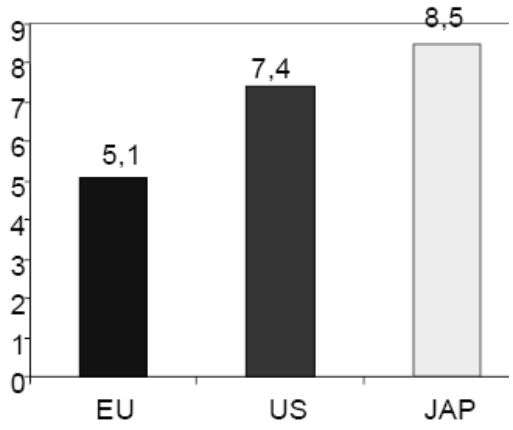
Source: DG Research (in Dosi et al., 2005; p.23)

Figure 4.8. Number of researchers employed in firms per 1000 labour force (1997)



Source: Research DG, based on OECD (in European Commission, 2000c; p.31)

Figure 4.9. Number of Researchers per 1000 labour force (1997)



Source: Research DG, based on OECD (in European Commission, 2000c; p.31)

In order to strengthen Europe's science and technology base and promote competitiveness, since 1998 the EU has developed several Framework Programmes in order to boost research cooperation among European countries, and to create a cooperative approach.

The forthcoming 7th Framework programme (2007-2013) aims:

- To gain leadership in key scientific and technological areas by working together
- To reinforce the excellence of Europe's knowledge base by fostering competition among researchers at EU level
- To strengthen the career prospects and mobility of researchers
- To develop and fully exploit the EU's research capacities through large-scale infrastructures, regional cooperation and innovating SMEs

It is organised in four main programmes following the main objectives of the European research policy (European Commission, 2005a, p.3):

(a) Cooperation: with the aim of promoting trans-national research projects and networks.

(b) Ideas: In this category, the creation of an autonomous European Research Council (ERC) to support "frontier research" in every field of knowledge and select projects through peer review with the aim of achieving scientific excellence

(c) People: Activities focused on reinforcing key aspects of skills and career development

(d) Capacities: Activities related to support European research and innovation capacities.

As the European Union suggests, the idea of the ERA has been to start with these instruments. Although undoubtedly some progress have been made, it seems that the main research framework is still national, overlapping in some fields with European Union policies (European Commission, 2000a). Regarding the diversity of national frameworks of innovation, the Trend Chart on Innovation in Europe[58], running since January 2000, summarises information and statistics on innovation policies and trends in Europe in an annual report (Innovation Policy in Europe). These endeavours aim to tackle the increasing gap in the R&D effort in relation to our mentioned rivals, USA and Japan (European Commission, 2000b).

[58] Joint initiative between the Innovation Policy Directorate of the Enterprise and the Industry Directorate General of the European Commission.

If we consider the fact that universities employ 34% of the total number of researchers in Europe[59], it is crucial to support them. Accordingly, universities are receiving around "one third of the funding under the framework programme for technological research and development, and particularly the support actions for research training and mobility" (European Commission, 2003a; p.10).

In order to make progress towards a better organisation of research in Europe, the European Research Area (ERA) is being developed. This project aims to create the necessary conditions to increase the impact of European research efforts "by strengthening the coherence of research activities and policies conducted in Europe" and "offers a new horizon for scientific and technological activity and for research policy in Europe" (European Commission, 2000b; p.3).

This ambitious overall goal should embrace different actions (European Commission, 2000c; p. 8), among others we highlight (see next figure):

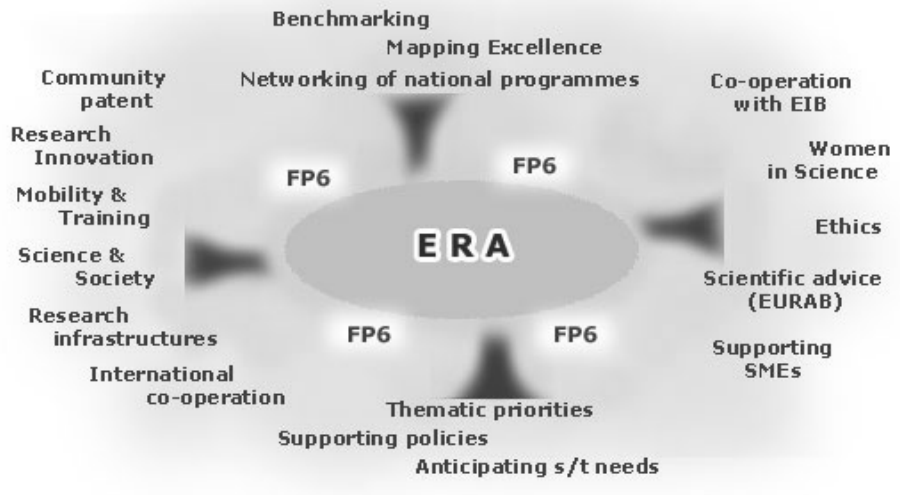
- Networking of existing centres of excellence in Europe and the creation of virtual centres through the use of new interactive communication tools.
- A common approach to the needs of financing research facilities in Europe.
- More coherent implementation of national and European research activities
- Better use of instruments and resources to encourage investment in research and innovation
- Establishment of a common system of scientific and technical reference for the implementation of policies.
- More abundant and more mobile human resources: greater mobility of researchers, stimulating young people's taste for research and careers in science, etc.
- Making Europe more attractive to researchers from the rest of the world.

Summing up, these two on-going initiatives – EHEA and ERA - are conceived with the conviction that the quality of higher education and research is, and will be, a crucial element of Europe's international attractiveness and competitiveness (Prague Declaration, 2001). According to this, both projects will benefit from their results and

[59] Note that this data is an average, and this figure varies according to the different European States (70% in Greece, 55% in Spain or 26% in Germany) (European Commission, 2003a; p.5).

experiences, and synergies should be identified and exploited. These symbiotic initiatives configure a crucial pillar of the Knowledge-based Society in Europe.

Figure 4.10. Activities to Promote ERA



Source: http://europa.eu.int/comm/research/era/index_en.html

Due to the new political framework, our European HE institutions are obliged to move towards a more comparable, flexible, transparent and competitive model.

Lastly, it is important to mention that in order to develop real excellence in research and teaching, the European Union should encourage a set of conditions (European Commission, 2003a):

a) Long term planning and financing,
b) Developing interdisciplinary capabilities, and
c) Implementing efficient management structures and practices, which implies an "effective decision-making process, a developed administrative and financial management capacity, and the ability to match rewards to performance" (European Commission, 2003a; p. 17).

The last aspect is one of the main challenges of contemporary HE policy agenda, and becomes one of our main motivations for the analysis of IC approaches as a managerial instrument for governing our universities better; a point we will discuss on in chapter 6.

4.4. Final Remarks

Nowadays HE institutions are considered key elements not only in the science and technology policy agenda but also in national innovation systems and in society as a whole. Despite universities being generally considered static organisations, they have adapted to changes in socio-economic context over the course of time.

To better understand universities and their context, we have analysed the university income structure and the main foundations for public funding. Accordingly, changes in public funds rationale during the last twenty years, mostly concerning the overall amount of resources devoted to universities and the funding allocation criteria, were discussed as one of the most important factors which has brought about university transformation.

On one hand, data on university incomes in the industrialised countries show a sharp decrease in relative terms in government funds devoted to universities while other sources - mainly money coming from private companies - are increasing substantially. On the other hand, shifts in the allocation mechanisms, new societal demands for accountability and transparency in the use of public funds, and research assessment are affecting university behaviour and are considered by most scholars the main reasons for broadening the scope and scale of industry-academia relationships.

Understanding that the linear model of innovation is unable to explain the complex processes of knowledge production which characterise the so-called knowledge-based economy, evolutionary economic theories – 'Mode 2´ of knowledge production and the Triple Helix model - are making their contribution with an alternative view. These approaches point out that we are immersed in a new paradigm of knowledge production defined by transdisciplinarity and solution-oriented research (Gibbons et al., 1994). In this new scenario university-industry-government relationships become more dynamic and interdependent, contributing to the creation of hybrid organisations, alliance between universities and firms, trilateral networks, etc. (Etzkowitz & Leydessdorff, 1996). They have become crucial for understanding the role of universities and the importance of strong links between HE organisations and other institutional actors in the current economy (Mowery & Sampat, 2004).

However, there is no empirical evidence to support these approaches. Even though academia-industry partnerships and networks among different agents have increased over the last two decades, in practice most Western universities have kept their disciplinary-based structure established one century ago and, to some extent, still follow the linear conception of innovation. Most universities are organised in faculties, departments and units following the conventional view of disciplines characteristic of `Mode 1´ defined by Gibbons (1994). The internal structure and organisation constrain the way academics work in both teaching and research, and do not facilitate cooperation among faculties and institutions. As a result, and even though some pioneer universities are trying to implement multidisciplinary studies, most degree programmes reproduce conventional disciplinary approaches. Research assessment procedures, resource allocation mechanisms and publication rules in international journals are also constrained by disciplines. For these reasons, it could be said that transdisciplinary research is not yet a general pattern.

Accordingly, national and European research programmes have as one of their main aims to foster multidisciplinarity and industry-academia collaboration. In line with this, the Seventh Framework Programme of the EU has established a specific programme to support cooperation between universities, industry, research centers and public authorities (European Commission, 2005).

Our concern is that, in order to adapt to the current mode of knowledge production and to socio-economic demands, contemporary universities would need to implement radical changes in their internal structures, strategic objectives and organisational culture.

Consequently, we have examined the current trends within the HE sector, focusing on the new concepts of managerialism and entrepreneurialism. By doing that our main aim has been to answer the following research questions: **What do we understand by managerial and entrepreneurial universities? Do both concepts overlap?**

Aware of the necessity for a better definition of these notions, in this chapter we have defined a set of characteristics for clarifying each notion. It is important to note that, after analysing both concepts we can argue that being a managerial university does not

imply necessarily being an entrepreneurial organisation, while being an entrepreneurial university entails different governing styles and structures.

Furthermore, given the lack of empirical data to assess the potential benefits or drawbacks on academic knowledge of these new trends, we have discussed the main controversial issues in order to contribute to a more critical analysis.

Especially important for this PhD Thesis are the new ideas on managerialism. This trend particularly stresses the need to introduce management tools, practices and mechanisms traditionally used in business in public HE organisations.

Finally, the structural transformation taking place in European HE and research systems are highlighted. Note that the implementation of efficient management structures and practices within HE institutions are considered crucial for developing real excellence in both research and teaching (European Commission, 2003).

Given the new university context, and with the aim of contributing towards a more efficient European HE sector, we will be exploring IC approaches as a suitable managerial tool to improve internal management and transparency within HE and research organisations in next chapter.

5. INTELLECTUAL CAPITAL APPROACHES IN PUBLIC UNIVERSITIES AND RESEARCH CENTERS: A NEW ANSWER FOR IMPROVING TRANSPARENCY AND INTERNAL GOVERNANCE

Within the paradigm of *new managerialism* discussed previously, in this chapter we examine the rationale of implementing Intellectual Capital (IC) approaches in HE and research organisations. It is a fact that these approaches are gaining more and more importance as a tool for measuring and reporting on intangibles not only at firm level but within universities and research organisations. Supranational organisations like as the OECD, the European Union or the World Bank are showing an explicit interest in this issue organising working groups, international conferences, etc.

The Intellectual Capital Report (ICR) is presented as a tool for visualizing an organisation's inputs, outputs and processes comprehensively. At European level, Austrian universities constitute a paradigmatic example of introducing new managerial ideas. Accordingly, changes that have occurred in the Austrian tertiary sector due to the university legal reform started during the 90s are described. They are the first HE institutions worldwide which are obliged by law (University Organisation Act, 2002) to apply ICRs annually. Despite the fact that universities are not compelled to report their IC until 2007, several trials are being implemented in this transitional period, and the advantages and problems that have arisen from these exercises will be outlined. Furthermore, other initiatives implemented by pioneer European universities and research centers are described.

Although the Austrian experience and the other voluntary initiatives are not comparable, their analysis will allow us to highlight the benefits and obstacles of implementing IC frameworks within these particular organisations, and reflect on the dichotomy mandatory versus voluntary basis, and on the debate between about the level of standardisation of the ICR.

5.1. Rationale for Intellectual Capital Approaches in Universities[60]

As was explained previously, given the new pressures and demands of the rapidly changing environment, universities throughout Europe are forced to adapt their organizational structures and incorporate management systems to run their affairs more efficiently.

Universities are becoming aware of the increasing competitive environment of the higher education system. They face important challenges (European Commission, 2003a): the creation of new public and private universities, the education given by firms through what they call `corporative universities´[61] to contribute to the lifelong learning process of their own employees, and the increasing level of internationalization of education and research. However, "European universities are attracting fewer students and in particular fewer researchers from other countries than their American counterparts" (ibid., 2003a; p.6), which leads to increasing pressure to incorporate knowledge management models within university management structures.

The first step towards better management and governing systems was to establish a general framework of quality assurance procedures during the second half of the 90s. In accordance with this, national accreditation agencies are being created and evaluation methods, procedures and indicators are being defined. Furthermore, and following the Council Recommendation (1998) on European Cooperation in Quality Assurance in Higher Education, the quality assurance system should be based on common features (European Network for Quality Assurance in Higher Education, 2003): the creation of an autonomous body, objective internal and external aspects of

[60] Section mainly based on: Sánchez & Elena (2006), Castrillo (2006) and Sánchez, Elena & Castrillo (2006b, c).
[61] Following Jarvis (2001), the term `corporate universities´ is used to refer to "those institutions founded by corporations for their own education and training purposes" (Jarvis, 2001; p.97).

quality assurance, the participation and real commitment of stakeholders, and, the diffusion of the results.

In this context, the European Network of European Higher Education (ENQA, 2003; p.3) works "actively in the process towards ensuring a credible European quality assurance environment". One of its important endeavours has been to develop a European survey to identify the diverse evaluation models used in different countries and to analyse their similarities and differences.

The appearance of quality as a relevant issue in university discourse shows an initial, but important, awareness with respect to managing and publishing information about intangibles.

In accordance with this, if we analyse some management concepts such as strategic planning or quality control and assessment mechanisms, higher education seems to embrace business concepts following the patterns in firms (Wissel, 2004). In other words, concepts originally used only in the business world, such as Total Quality Management (TQM) or ISO certification, are now being adapted by HE institutions around the world.

By focusing on intellectual capital and knowledge management approaches, they could become significant management and reporting tools for the following reasons:

(a) When referring to IC or intangibles, we are pointing at the measurement of elements that are especially significant in HE institutions, since a university's 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 & Sánchez, 2004).

(b) Because of the new demands for accountability in public institutions, universities and research centers are forced to be more transparent and to disseminate more information to stakeholders (students, public authorities funding universities, the labour market, and society as a whole). As asserted by the European Commission (2003a; 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 et al., 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 necessarily requires new management and reporting systems

(d) Universities are becoming aware of this increasing competitive environment in the higher education system, and this competition appears to increase in the future (Cañibano & 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 the best students, researchers and professors, and to compete for public and private funds to improve their activities.

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

In summary, and as pointed out by EARMA[62], those academic and research organisations that are able to develop both the culture and the capacity of their staff, to value, manage and report on their IC, will be advantageously placed in the HE scenario.

[62] European Association of Research Managers and Administrators.

5.1.1. Benefits of the Intellectual Capital Report as a tool for managing and reporting on intangibles

One concrete tool successfully applied in different sectors is the so-called Intellectual Capital Statement or Report (from now on: ICR), which is used to identify and deliver information on strategy, aims, visions, activities and resources, based on indicators (financial and non-financial). The benefits of using the ICR fall into two categories (European Commission, 2006b; Marr, 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).

- The other category is its potential to function as a communication device linking the institution to the outside world and used to attract resources – financial, human and technological (external reporting function) and to foment relationships with partners and customers.

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.

Accordingly, an Intellectual Capital Report 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, on the other hand, an IC Report for public disclosure. This will be used as a form of communication, and any information given 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 and to attract new employees, partners and collaborators (European Commission, 2006b; p. 135).

Disclosing information on Intellectual Capital acts as a powerful tool for communicating 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. It is therefore necessary to select the appropriate indicators carefully.

It is a fact that in recent years these ideas about managing and reporting on intangibles and IC have been acquiring progressive importance worldwide and, specially, in the European Union. The guidelines and documents of reference: - the MERITUM, Danish, Japanese and Australian IC Guidelines, and he RICARDI Document – described in section 2.3 of this PhD Thesis, are clear proof of this interest.

Moreover, since the end of the last decade several international conferences, symposiums and workshops have been organised to discuss and reflect on the importance of IC at firm level and within the public sector.

In 1999, the OECD organised an international symposium on "Intellectual Capital, Measuring and Reporting Intellectual Capital: Experience, Issues and Prospects" held in June in Amsterdam (The Netherlands). Its overall goal was to analyse the feasibility and value of the IC information in order to improve internal management and decision capacity within organisations. One of the main ideas that underlined the conference was the need to harmonise data on intangibles in order to allow comparison and benchmarking analysis.

The first Workshop on "Visualising, Measuring and Managing Intangibles and Intellectual Capital" and the OECD International Policy Conference[63] entitled "Intellectual Assets and Innovation: Value Creation in the Knowledge Economy" both held in Ferrara in October 2005 reflect the huge and numerous endeavours world-wide to promote IC management and reports in different institutions. In addition, other

[63] The next OECD Conference entitled "Intellectual assets-based management toward innovation & sustainable growth" was held in Tokyo on December 7th and 8th. It is further proof of the importance of this topic and the sustainable implication of supranational organisations.

international organisations such as the World Bank, the European Commission, the World Intellectual Property Organisation, the European Patent Office and the European Investment Bank have been involved in different activities to identify, measure, manage and disclose information on intellectual assets following an IC scheme and supported the aforementioned Conference. These two international events aimed to contribute to a better understanding of IC and intangibles in the knowledge-based economy and their inter-relationship and value creation in organisations, with special sessions devoted to the development of IC models for public universities and research centers.

In the light of the successful of these scientific events, the second Worksop was celebrated in 2006 in Maastricht and it intended to be a further step towards the widening and strengthening of this research field. Next event will be next October 2007.

Summing up, in this section we have highlighted that the potential benefits of using the IC framework in public research institutions and universities. However, in practice, there is still only a very small proportion of universities and research centres that are identifying, measuring and valuing their intangibles.

Accordingly, our analysis will mainly focus on the most relevant experiences at the European level. Accordingly, the next sections are devoted to describing the most relevant pioneer initiatives that are being developed in practical terms across Europe with the aim of giving new insights into the potential benefits and drawbacks of the co-existing different models and indicators, and into the voluntary approach/mandatory basis debate. However, being aware of the existence of organisations that are undertaking ICR not only in Europe but also in Asian countries, we include one outstanding experience: the Intellectual Capital Report developed by ETRI[64].

The most significant one is probably the case of Austrian universities, which are obliged to manage and report their IC annually through Intellectual Capital Reports (ICRs). Moreover, other initiatives and experiences are being developed based on voluntary approaches.

[64] Electronics and Telecommunications Research Institute.

5.2. Austrian Higher Education Reform: towards managerialism?[65]

Although it is not the objective of this section to describe the Austrian HE system[66] in-depth, a brief explanation of its composition will contribute to a better understanding of the reform which has been taking place since the beginning of the 90s.

The Austrian HE sector is composed of three types of institutions: Universities, Colleges of Art and Music, and the so-called *Fachhochschulen*. The first two are in the traditional university sector while the latter constitutes the non-university higher education sector. Fachhochschulen´s aim is to provide students with a high level of technical education with shorter study programmes than at university (Beerkens, 2003). This non-university sector was introduced into the Austrian system by federal legislation at the beginning of the 90s[67] and represents an important step towards decentralisation since the Federal Government is not directly responsible for the administration, management and articulation of their programmes.

The HE system in Austria is mainly funded by public funds through the Federal Government. According to the CHEPS Report (2003) and Beerkens (2003), during the 90s the share of the Federal budget increased from around 3.2% (1990) to around 4.2% (1999). The public expenditure in HE in 1990 was 1,29 billion Euros, and at the end of the decade (1999) it reached 2,39 billion Euros. This shows an increase (adjusted by inflation) of 54%. Public funds devoted to HE institutions, mainly until the university reform in 2002, were mostly defined according to the number of students enrolled each academic year. Consequently, the higher education budget in the 90s was analogous to the increase in students and the academic personnel. The budget, itself, accounts for around 1.2% of the GDP corresponding to the average in OECD countries.

For more than a decade the Austrian HE system has been under radical reform in order to provide more institutional autonomy to universities. This reform, however, is

[65] I am grateful to Karl Leitner and Andrea Kasztler from the Austrian Research Center and to Otto A. Altenburger from the University of Vienna for their helpful comments for this section.
[66] For detailed description of Austrian Higher Education see Beerkens (2003), CHEPS Report (2003) and Wadsack, I. and Kasparovsky, H. (2004).
[67] The *Bundesgesetz über Fachhochschul-Studiengängelaw* was approved by the Austrian parliament in 1993, and the first programmes started in 1994 (Beerkens, 2003) CHEPS Report.

not the only attempt in the world[68], or even in Europe[69], to change governance structures and introduce managerial mechanisms in universities, although it could be considered a unique initiative regarding the introduction of Intellectual Capital Reports (ICR). Accordingly, we consider the reform undertaken in 2002 as one of the most radical and courageous in Europe in recent decades.

This section will analyse Austrian endeavours to reshape university internal organisation, mainly focusing on the development of ICRs.

5.2.1. Overview of the Austrian University Reform

The Austrian EH system is a legacy of the Humboldtian tradition described in the former chapter with its unity of teaching and research, state funding, civil servants and almost free access to all studies and programmes for everybody, being the most outstanding characteristics. According to the Austrian Constitution, universities are public organisations under federal legislation and jurisdiction, and academic freedom of research and teaching is guaranteed. As described by Meister-Scheytt and Scheytt (2005), until the 90s, Austrian universities were characterised, at institutional level, as over-bureaucratised organisations where top management (deans and vice-chancellors) lacked the professional experience or capabilities to govern. In most cases, the election of the governing body was the result of `micro-political processes´. As a consequence, governance structures in Austrian universities "were weak and ambiguous" (Meister-Scheytt and Scheytt, 2005; p. 79).

Changes implemented in Austrian universities came as a result of a mandatory legal reform whose main objective was to make universities more competitive, efficient and autonomous in order to face the challenges of the new globalised higher education context. The models followed as reference for reshaping the Austrian HE system were those of Anglo-Saxon tradition, mainly, the UK, Australia and Netherlands, (Meister-Scheytt & Scheytt, 2006).

[68] For experiences in Australia and USA see (Coaldrake et al., 2003).
[69] For other examples In Europe: The Netherlands (De Boer & Goedegebure, 2001), Scotland, (Sizer & Cannon, 1999), UK (Middlehurst, 2004).

In general terms, it can be affirmed that the Austrian university reform clearly follows New Management principles, focusing on autonomy, output orientation and performance-based funding (Titscher et al., 2000)[70].

The most significant legal developments are: the University Organisation Act of 1993, -and its amendments of 1997 and 2001 -, the University Study Act of 1997, and the new University Act 2002. Although they are all important, the University Study Act (1997), which regulates the introduction of the new bachelor and master degrees in accordance with the European credits system (ECTS) required by the Bologna process and the European Higher Education Area (Beerkens, 2003), does not affect the governing structure of universities, so it will not be explained in detail. Our focus will only be on the other two Acts.

At the beginning of the 90s, an ambitious reform towards more autonomy[71] and, consequently, more accountability started. Indeed, it is in 1990 when the State first allowed universities to attract private funds by selling their services to the market.

The first relevant step in that direction was the University Act 1993[72] (from now on UOG93). In general terms, a University Organisation Act (UOA) is the legal mechanism used by the Federal Government through which the general mission of the universities is determined, as well as the guiding principles for teaching and research, the university's location, the competences of the governing bodies and the internal procedures (Sporn, 1999). UOG93´s main objective was, actually, to provide universities with more institutional autonomy regarding the design of their internal organisational structures, a mechanism for personnel recruitment and the management of financial affairs, mostly related to the allocation of resources. Accordingly, governance, management and leadership within universities were affected (Sporn, 1999). In practical terms, this meant that the Rector and the dean became "much more powerful than previously" (Pechar, 2003; p.7).

[70] In Leitner (2004; p. 132).
[71] In this context we are referring to the concept of institutional autonomy meaning the margin of manoeuvre to make strategic decisions, not in the Humbodltian sense of academic freedom of professors and researchers.
[72] The implementation process started in 1994/95 academic year (Sporn, 1999) over a period of 6 years, and was fully implemented in 1999 when the undertaking was completed by the three biggest Austrian universities: Vienna, Innsbruck and Graz.

In line with the Austrian Ministry of Education, Science and Culture Report (2001), the University Act 1993 attempted to introduce businesslike management and service-oriented views in order to better use their resources following efficiency, quality and cost effectiveness criteria. This new conceptualisation of the university meant redefining the relationship between the Federal State and HE institutions. This new relationship implied, simultaneously, a significant increase in decision-making power and the independence of the university governing bodies as well as a reduction of governmental influence.

UAC 1993 represented the first clear step towards new managerialim ideas in the governance of Austrian universities, forcing changes in the internal structures and in the management tools and mechanisms. As pointed out by Sporn (1999) and Pechar (2003), one of the most profound changes in that direction was the intention to balance the traditional collegiate style of governance (which allows the different internal stakeholders of the academic community – professors, administrative staff, researchers, students, etc. - to be involved in the decision-making process) with the introduction of professional managers. At institutional level, this implied the constitution of a executive body chaired by the Rector (Präsidium), and an external body (Kuratorium) with mainly advisory functions rather than a body with governing capacity (Pechar, 2003). Following the metaphor used by Sporn (1999) in the case study of Wirtschaftuniversität Wien[73] (WU), the top-level governing body could be compared with a CEO in industry and an advisory committee with the board of directors (Sporn, 1999; p.243).

However, when implementing the law, universities were faced with some problems since the flexibility to manage resources remained restricted while "the general regulations for employment, payment and budget of the federal government continued to apply" (Beerkens, 2003; p.36).

Therefore, some years later, the University Organisation and Studies Act[74] (from now UG2002[75]) converted universities into "legal entities in public law" (UG2002, art. 4), what in practice implies that they are (from 1st October 2004) "largely free to run their

[73] University of business administration and economics founded in Vienna in 1898.
[74] University Organisation Amendment Act and Universities of the Act Organisation Amendment Act, Nº 120/2002 / 9th August, 2002. For more information see http://www.bmbwk.gv.at.
[75] See Federal Ministry of Education, Science and Culture (2002).

own affairs" (Höllinger, 2004; p.1), although the Federal Government still has the legal responsibility to fund them (UG2002, art. 12).

This has probably constituted the most important move towards a real reform in university governance and management structures. The main goals of this Act are (Hölinger, 2004):

- To enhance university research and teaching performance
- To use resources more efficiently
- To adapt more flexibly
- To promote creativity and individual initiative
- To become a more active, independent and critical intellectual authority

Increasing autonomy and, consequently, accountability, as well as introducing mechanisms for funding allocation (linking public funds with performance) are the main ambitions of the University Act. On one hand, the UG2002 has focused on widening the university's margin of manoeuvre to define their own profile, create their own organisational structures and allocate their funds based on mission statements and the definition of a strategic plan specifying concrete goals and objectives. As its article 1 explicitly declares "universities and their governing bodies shall constitute themselves under conditions of the greatest possible autonomy and self-administration". On the other hand, universities are increasingly requested to report on their performance in order to obtain public funds for their activities.

The main implications of the UG2002 can be summarised as follows:

- Performance Agreements. Despite the increase in the degree of autonomy, universities will be under the supervision of the Federal Government since, as mentioned before, Austrian universities remain mainly State funded.

However, the novelty relates to the new resource allocation mechanisms that the University Act has established, based on formula and performance agreements. According to the new rationale, each university will receive a global budget established in advance for a three-year period. Starting in 2007, this budget will be composed of two parts: a basic budget (80%) and a formula-based budget (20%). The latter proportion of the budget will be calculated in accordance with quantitative and

qualitative indicators related to teaching, research, social goals, and the advancement of arts in each university (art.12). These performance indicators (some are included in the battery of indicators for the ICR) and the method of calculation for the formula-based budget were defined by an Order of the Austrian Ministry of Education, Science and Culture in February 2006. Although it would be interesting to include the battery of indicators, unfortunately the Order is German and has no English translation at the moment.

It is important to note that universities are free to use and allocate their resources since the Rectorate is responsible for the management of financial affairs and should conduct them using efficiency, expediency, frugality and transparency criteria. The university's financial management is, however, examined by the Federal Audit Office.

Regarding research funding, the Act allows university academics to undertake research contracts which "are financed not from the university budget but third-party research contracts" (art.26). In addition, it is important to mention that the application of the project funds shall be "at the discretion of the project leader" (art.26).

This new funding rationale and the greater degree of autonomy have been defined as `performance agreements´ and are "contracts in public law" between universities and the Federal Government for a three-year period (art.13).

The contract includes:

- Strategic objectives, academic priorities and university and human resources development, specifying those to be achieved during the period of the performance agreement.
- Research and the advancement and appreciation of arts. Universities should accordingly disclose their planned research projects and programmes.
- Study programmes and continuing education
- Social goals
- Internationalism and mobility, and
- Inter-university co-operation

Although the first performance agreement will be for the period 2007-2009, a pilot period (2004-2006) was established to prepare universities for the new context and

new responsibilities, but during which they were legally guaranteed the budget (Höliger, 2004).

Each university is obliged to present the Minister with performance reports and a financial statement audited by the university council by 30 April annually, and to provide public access to these documents (art. 20.6).

- Quality management systems and evaluation procedures. Following this Act, Austrian universities need to develop their own quality management system in order to assure quality levels in teaching and research (art. 14).

The subject of evaluation is not only the university at institutional level, its duties, services, activities and results, but also the performance of all teaching staff? and researchers, whose work must be assessed at least once a year.

Since April 2004, the Austrian Quality Assurance Agency (AQA) has been working in order to facilitate the evaluation process and the introduction of quality management systems. This agency was set up by the Austrian Rector Conference, the Austrian Fachhoohschul-Conference, which represents the private sector, the Austrian National Union of Students and the Federal Ministry for Education, Science and Culture.

- Human resources policies have changed and new academics will not be hired as civil servants anymore but with contracts under public law, although present staff will retain their status.

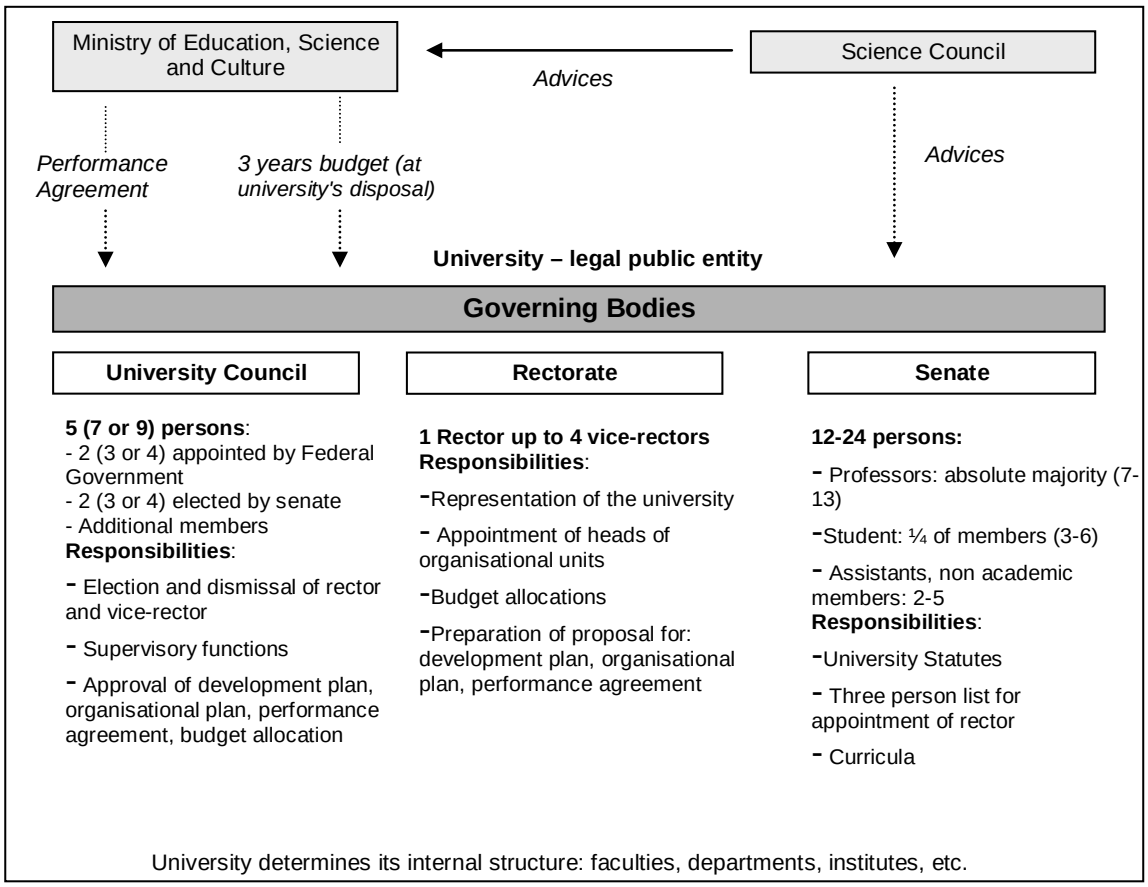
- There are principally three governing bodies of Austrian universities: The Rectorate, Senate and University Council (see figure 5.1).

The Rectorate is in charge of managing the university, which includes budget allocation and preparing the annual performance agreement and the intellectual capital report. As stated in the UG202 in article 21.(3), “in determining the composition of the rectorate, care shall be taken to ensure that it possesses the necessary academic, managerial and administrative capabilities”.

The Senate (art. 25) is the academic body composed of representatives of professors, general university staff and students.

In addition, the so-called "Universitätsrat" or University Council (art. 21) consists of five, seven or nine members (depending on the size of university) who must be holders of past or present positions of responsibility in academia, cultural life or business. This board of governors is one of the most relevant changes brought about by this law.

Figure 5.1. Austrian University Structure and Organisation after University Act 2002



Source: Hölliger (2004)

As mentioned before, this body was already created by the UOA93, but it was not until 2002 when it was given real competences and power to take decisions on strategic issues in university life. As pointed out by Meister-Scheytt & Scheytt (2006), "by establishing this board in each university, the Austrian government wanted to implement a governance structure known as the 'two-tier model of governance' of private companies in the German-speaking area: a board of managers (in private companies: Vorstand) responsible for the management of a company is augmented by

a board of governors (in private companies: Aufsichtsrat) that supervises the board of managers" (Meister-Scheytt & Scheytt, 2006; pp.9-10).

- Finally, the introduction of Intellectual Capital Reports (ICRs) signifies one of the most important implications for managerial ideas. The next subsection will give detailed explanation of them and their application in Austrian universities.

Many authors defined Austrian university reform as one of the most advanced and courageous within European HE systems. However, the law itself does not guarantee a real transformation of university governing bodies and structures. Indeed, fundamental shifts in university cultural behaviour may be necessary to really achieve the effects intended by the law. However, a cultural change could be provoked as a consequence of the practice and implementation of the law. Accordingly, the implementation processes become crucial.

Analysing the practical and real implementation of the UG2002 was the main goal of the case studies developed from October 2004 to April 2005 in two Austrian universities[76] by Meister-Scheytt and Scheytt (2006). This study shows empirical results and reveals the problems and unintended consequences of the new organisational structure in practical terms, focusing on one of the central pillars of the reform: the board of governors.

One of the most important problems concerns the composition of the governing committee. With reference to this, the authors state that only a few members of the university council were experts on university management and affairs. In most cases, they lacked knowledge and experience of higher education systems and had a strong influence of business sector Although this was not considered an obstacle to governing, it is clear that the experience and knowledge of the board members determine the quality of their work. The majority of board members were from private companies, while academic institutions made up only 29%, and less than 14% were from other fields and social areas such as culture, arts, etc.

The main consequence is that the university governing model is likely to take on a company-like orientation with the implicit danger that the governing board would try to

[76] The name of the universities are not reveal for confidentiality reasons

implement business management systems without adapting them to the specific characteristic of HE institutions (Meister-Scheytt and Scheytt, 2006; p.23).

Summing up, it can be affirmed that the Austrian university reform is in keeping with the ideas on *managerialism*, in which the implementation of management tools is considered the way to increase efficiency and effectiveness in organisations. However, empirical analysis shows that the way the reform is implemented in each university, the composition of the governing committee and the adaptation of the management mechanism to the specific characteristics of HE institutions are the key aspects to generating real change.

5.2.2. Intellectual Capital Reports in Austrian Universities

As it was argued in the previous section, in a context of greater autonomy new regulations are gradually encouraging Austrian universities to introduce new managerial ideas which have been used in the private sector. Hence, the Austrian Federal Government has promoted a reporting model whose contents have "more comprehensive information about the development and effective use of intangible resources" (Leitner, 2004; p. 132).

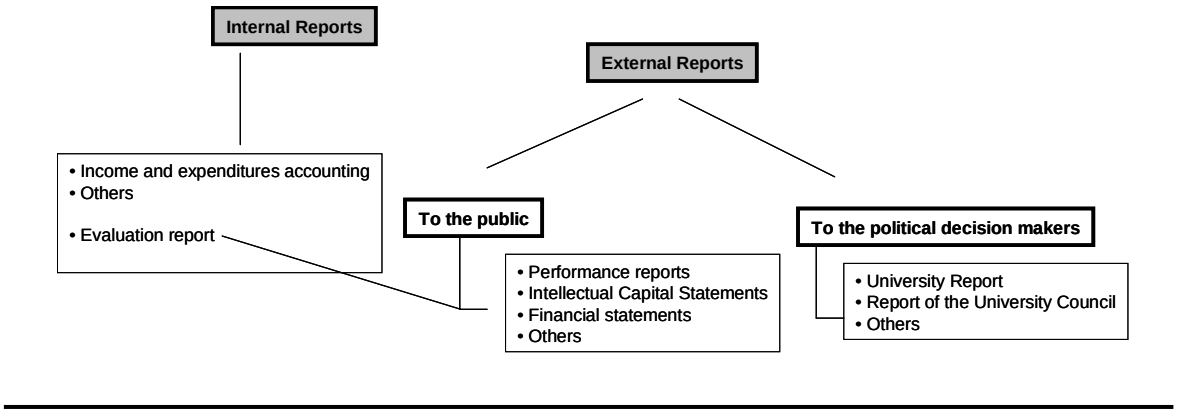
Austrian public universities are the first HE institutions in the world that are obliged to produce and diffuse Intellectual Capital Reports (called *Wissensbilanz*). The UG2002, in article 13, established the obligation and the general framework for developing the ICR. By doing so, the Austrian Ministry for Education, Science and Culture recognises that the "the efficient use of IC is essential for universities' performance" (Leitner et al., 2005). The first IC Report should have been published in 2005, however, the ministerial Order[77] with the selected indicators was, in fact, issued on February 15th, 2006 (Alterburger & Schaffhauser-Linzatti, 2006). It will therefore be mandatory by 2007 and Austrian universities will have to submit an ICR annually, following the calendar year.

Publication of the IC report has to be parallel to the preparation of the performance report, the financial statements and other reports (see figure 5.2). However, they should not overlap. On the contrary, "while the performance report only deals with the topics addressed within the performance contract, the idea behind IC reports is to give

[77] Federal Ministry of Education, Science and Culture (2006).

universities the opportunity to report on their full range of activities without restrictions" (Leitner, 2004; p. 132). Like other relevant university documents, ICR should be available for public use (UG2002, art 20.6)

Figure 5.2. University Reports according to UG2002



Source: Schaffhauser-Linzatti and Alternburger (2006)

According to the UG2002, the ICR has to fulfil a minimum set of points:

- University activities, social goals and self-imposed objectives and strategies
- Its Intellectual Capital, broken down into human, structural and relationship capital
- The processes set out in the performance agreement, including outputs and impacts.

Each university has to report on its input, output, and performance indicators for teaching, research, and third mission activities. The Ministry should detail the structure and contents that the Report will include. The ICR should be prepared for the whole institution and, probably, for scientific fields. Furthermore, each university is free to publish ICR for other sub-levels, like departments, or faculties (Leitner et al., 2005)

In accordance with the arguments expressed in the former section and the Federal Ministry aims, the Report has a twofold objective: to identify and measure intangibles for management purposes and to provide information to stakeholders.

The introduction of ICR in the Higher Education system represents a crucial step towards managerialism. It sets in motion a crucial internal dynamic in universities

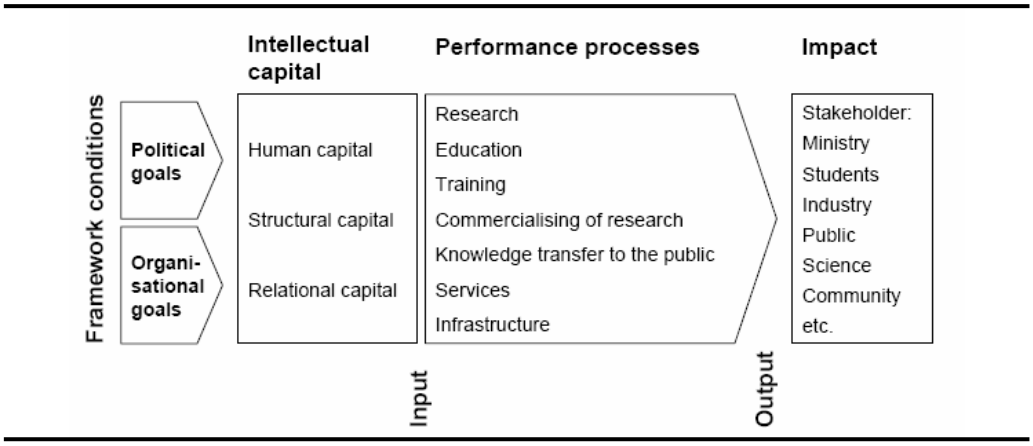
towards identifying, measuring, managing and disclosing core intangible assets and activities as well as the value creation process.

The University ICR is based on the model and principles developed in the Austrian Research Center (ARC), the pioneer research European institution in applying IC models to manage its intangibles and in reporting that information. The characteristics and main foundation of the ARC Model will be explained in subsection 6.3.1.

The model (see figure 5.3) starts by considering the contextual conditions of the institution, analysing its strategic objectives and mission, and incorporating the three categories of IC: Human Capital, Structural Capital and Relational capital. The core of the model is the performance processes: research, education, training, commercialising of research, and knowledge transfer, that can be enlarged or reduced depending on the university profile (obviously, colleges of art, technological universities or business schools have different configurations and strategic objectives and processes) (Leitner, 2004). Finally, the impact on different stakeholders (academic community, government, industry, etc.) is analysed.

Considering the main mission and activities of HE institutions, the majority of them will be non-financial, so the descriptive elements become crucial to contextualise and better understand the information provided by the figures.

Figure 5.3. Model IC Reporting for Austrian Universities



Source: Leitner (2004)

A set of indicators complete the model based on (ibid, p.134): (a) the set of measures used in the past in Austrian universities; (b) proposed indicators in the intellectual capital literature, and (c) the findings of the evaluation research.

Recently, the Federal Ministry, in collaboration with the Conference of Rectors, has selected the final set of indicators in the Order published in 15th February 2006[78].

The new Order specifies the structure of the ICR, the way of presenting the information and the indicators to be published. It is very extensive and comprises 13 sections and two appendices. The next table summarises the central issues:

Table 5.1. ICR Order: Main Contents

13 Sections	Section 3. The structure of the IC Report Section 4. List of the nearly all indicators to be published: 53 indicators Section 9. List of the remaining indicators: 7 indicators
2 Appendices	Appendix 1. Definition of indicators Appendix 2. List of fields of studies

Source: Adapted from Altenburger & Schaffhauser-Linzatti (2006)

When summing up all the indicators in the sub-groups and sub-categories, Altenburger (2006) points out that the total battery of indicators that each university should publish is really excessive. For instance, the University of Vienna has to process up to 32.000. This huge number is being questioned, since, obviously, the "quantity of information does not necessarily correspond to the quality of information" (Altenburger et al., 2006; p.4)

Even though, as mentioned before, universities are obliged to report their intellectual capital by 2007, some leading universities have been working on it in advance. This is the case of the Chair of Financial Accounting and the Department of Pastoral Theology in the University of Vienna that has been developing trial ICRs for their subdivision. Altenburger & Novotny-Farkas (2005) analyse their experience of the implementation process, focusing on the problems and opportunities at external (regarding stakeholders) and internal level (for the university). As the authors point out, despite

[78] Federal Ministry of Education, Science and Culture (2006).

the fact that the ICR should refer to the university as a whole and this experience only covers particular units or departments, the trials could still produce interesting conclusions. The main difficulties and advantages identified by the authors are summarised in the next table[79].

Table 5.2. Intellectual Capital Report in Austrian Universities: Chances and Difficulties

	Advantages	Problems / Difficulties
External	To better present the Ministry with their performance in teaching and research (crucial under the new resource allocation rationale) To provide a more objective decision-making basis (for the Ministry to decide on the funds to distribute) To present interpretable and marketable information (important to attract funds not only for the State but for third parties) To provide information to other stakeholders such as students, firms, non-profit making organisations, and society as a whole To increase comparability analyses	Very focused on quantitative data: lack of a holistic idea of the value creation process Every ICR follows the same instructions (previously defined by law): and the same indicator could have different meanings and interpretations. The ICR model has been developed for a small research unit: its implementation in a large and heterogeneous university could be useless
Internal	To define the university mission statement, strategic objectives, academic priorities and university profile To understand the value creation process of the university, identifying structural and personal strengths and weaknesses To support the development of new strategies and actions, that can be used as a benchmark with other universities To monitor university performance, including incentives and sanctions systems To communicate the university objectives and performance to employees, increasing the link between institutional and personal interests.	Universities will intensify those activities which improve the indicators considered crucial in the Order. Important specific processes and aspects could be disregarded ICR could be used more as a controlling instrument than a motivating system ICR gives a lot of leeway in interpreting the indicators provided, and subjective influence on ICR results are likely University reporting model is based on the calendar year while university activities are organised in academic years.

Source: The Author, based on Altenburger & Novotny-Farkas (2005)

Summing up, since the new resource allocation rationale introduced by law forces Austrian universities to provide the Ministry (bm:bwk) with more and better information on their performance in teaching and research, the ICR could be a robust tool to provide improved information and help the decision-making process in budget negotiations. Furthermore, the development of a framework for valuing and reporting IC

[79] Notice that the trials were developed before the final definitions of the battery of indicators.

by universities and research organisations at national level might be helpful for further diffusion and comparison and mean a significant step in spreading these initiatives.

However, when analysing this initiative in-depth, we have been made aware of the following unintended consequences:

- There is a risk of divergence between external and internal reporting. The ICR should be a model that sheds light on the internal value creation process within the organisation and, in addition, a tool to disclose information to stakeholders. However, as in private companies, it is important to achieve a balance between the information used by the institution for internal purposes and that released to the public. For this to happen, auditing processes seem to be crucial to consolidate the process and to avoid potential information manipulation.

- There is great danger in reporting a set of indicators imposed by law without descriptive elements. As argued in the specialized literature and by practitioners of this topic, the system of indicators is not self-explanatory since each indicator can denote or imply different things depending on the agent who receives the information. Consequently, the descriptive elements become crucial to contextualize and better understand the information provided by the indicators. So, if universities limit their commitment to nothing more than a battery of indicators missing out the narrative elements that should complement the quantitative information, there is a risk of reporting a set of meaningless indicators. Moreover, as we explained in this sub-section, the number of indicators to be published is so excessive that the data could be more confusing that useful.

- We believe that the IC Report should be designed around the specific characteristics of each organisation to capture its idiosyncrasies and to reflect the specific situation and problems. Indeed, the Austrian ICR follows the ARC model and the law (UG2002) established the definition of the university's strategy and corporate goals as one of the minimum requirements. Nonetheless, the selection of indicators has been made in general terms to allow comparability among Austrian universities so there is no direct link between the set of indicators and the university's strategic plan. Indicators might reflect the strategic priorities, but the generally expected situation is an uncoupling of both elements in the process.

Indeed, in the medium and long run, universities may redefine their strategic objectives and goals taking into account the indicators that they have to fulfil. This potential situation could bias the main objective of the whole process.

- When designing the implementation process within the institution, it is extremely important for the success of the project that from the beginning there is a high degree of participation in the academic community and real involvement of the university top managers to accomplish the real objective of the IC Report. Only applying the law as an obligation to build a few indicators will not result in a learning process.

The process of applying ICR in Austrian universities has to be followed up by analysing its real impact on university management and reporting systems in the coming years.

5.3. Voluntary initiatives for the measuring and management of Intellectual Capital in universities and research centres

Different initiatives for implementing IC models and reports on a voluntary basis are being developed in a variety of universities and research centres not only in the European context but worldwide. In this way, different models for measuring, managing and reporting IC are emerging, which is, at the same time, increasing the concern about the relevance of intangibles within HE and the research sector but hindering the comparative analysis among institutions.

The following sub-sections outline the most outstanding experiences:

- Intellectual Capital Report - Austrian Research Centres (ARC)
- Innovation and Knowledge Management Institute (INGENIO)
- Intellectual Capital in HEROs
- PCI Project
- University of the Basque Country
- IC Model in ETRI

5.3.1. Austrian Research Centers Seibersdorf (ARCS) Model and its Impact on European HE and Research Organisations.

The Austrian Research Centers Group (ARC) is Austria's largest center of applied research. It is a limited liability company under Austrian Law, whose shareholders are the Republic of Austria (50.46%) and industry (49.54%) -including electricity utilities, banks, insurance companies, and professional associations -. It was founded at the end of the 50´s and has grown and diversified its research portfolio since then.

As defined by ARC, its main goal is "to strengthen the technological knowledge base of the Austrian economy through scientific/technological excellence and international research corporation, and to intensity the international competitiveness of Austrian companies thought the use of new technologies and research findings" (www.arcs.ac.at). ARC has an important function as an interface between basic research developed within universities, at national and international level, and applied research carried out by private companies. In concrete terms, ARC transfers academic knowledge to practical application, provides an infrastructure for cooperative research projects, addresses the need for information and concepts that benefit society as a whole, and assumes the risk of innovative research in the early stage (ARC,2000; p.5). Among others, its portfolio includes outstanding research activities in different fields: third generation of computer vision technology, new functional nanocoatings, biomedical systems or 3d simulation optoelectronics.

At the end of 2005, the Group employed more than 900 staff (based on full-time equivalents) in nine locations, which is nearly a 13% increase on the same date 2004, and it manages a total annual budget of about 75 Millions € (Rudolph & Leitner, 2002).

Since the last decade, the institution has introduced new management instruments, such as the ISO 9000 certification, the professionalization of research program management, process cost accounting or the balanced scorecard. "In the mid-nineties it defined itself as 'knowledge enterprise'; the development of an IC report was the logical step within this development" (ibid., 2002; p. 4).

Thus, this Austrian research organisation has carried out intensive research on intangibles and IC, covering both the theoretical approach and practical results, the

most important among them being the Intellectual Capital Report (ICR). Hence, it was the first European research organisation to publish an ICR. It was published in 1999 and was a comprehensive report on the intellectual capital in organisations, and was a significant step in the management and reporting on intangibles (ARC, 2000).

As explained in this Report, the main reasons argued by the research center to develop ICRs are (ibid., 2000):

- As a public funded organisation, ARC considers it crucial to maintain transparency in the use of public resources, and the ICR helps to illustrate the value creation process.
- The communication internal policy is considered a priority in the organisation. However, the research activity is "not self-explanatory: its benefits must be interpreted and communicated in a comprehensible way" (ARC, 2000; p.3). Accordingly, ICR became crucial to provide relevant information about their performance and to contextualize and explain it.
- ARC is convinced of the importance of knowledge management and intangible assets for the value creation process. Accordingly, a model to identify, measure and manage its intangibles was developed. This model should help the organisation to illustrate the development of intangible assets and to point out future areas of performance.
- The ICR is conceived as a new instrument to measure intangibles not shown in its annual report and is a crucial component in their corporate strategy. By producing this, all the stakeholders, -including public and private owners, costumers and suppliers, business partners, and the staff -, "can see the whole picture" (ARC, 2000; p.4).

The ICR is not merely conceived as an instrument to diffuse information to external and internal agents, but also, and even more importantly, to improve strategic management and to understand and learn about their internal process of value creation. As stated by Rudoplh & Leitner (2002; p. 4), the IC report "reflects the knowledge production within a research organisation".

It is based on a model which intends to show the flows of knowledge within the company over time, supported by a set of indicators (see figure 5.4). Despite the importance of the quantitative measurements, descriptive elements are included in order to help the reader to analyse the information supplied by the indicator, which

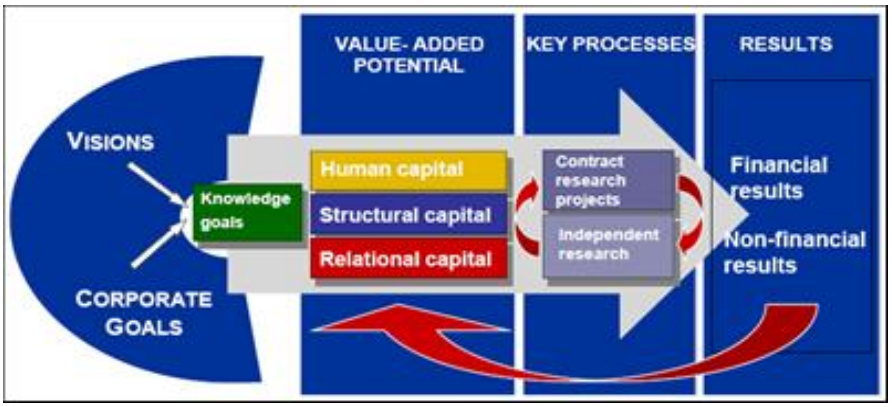
should be understood taking into account the context and circumstances of the organisation. This instrument aims to monitor and express the value of the organisation's intangible assets.

As shown in figure 5.4, the process starts with the definition of knowledge goals, which should be in line with the vision and the corporate strategy defined by the organisation, giving the company long-term direction. These goals will be accomplished defining a value creation process, which follows the intellectual capital framework: Human Capital, Structural Capital and Relational Capital, considering both an input and an output. For each knowledge goal and each category of the IC framework, indicators are defined to measure the key aspects of the organisation. Projects and independent research are carried out at operational level to get both financial and non-financial results, for the company and its stakeholders. The numerous interactions and spill-over effects of this process gives ARC its unique character. The model aims to show the connections and interactions among the different elements and aspects of the organisation that are not covered in the classical annual reports. In this way, this Report does not substitute the balance sheet but complement the information to the public.

The process of implementation of the ICR has provided the opportunity to have an internal discussion of goals and strategies, trade-offs, human resource policy, etc. and it is itself a learning process.

It is worth mentioning that, in contrast to other IC models, such as Navigator of Skandia (Edvinsson & Malone, 1997) or the Intangible Assets Monitor (Sveiby, 1997), the ARC IC model is "process-oriented", stressing the difference among inputs, outputs, and processes (Rudolph & Leitner, 2002).

Figure 5.4. ARC Intellectual Capital Model



Source: ARC (2003; p.18)

The Report is being published annually, and it has been modified and improved reflecting the latest aims, strategic objectives and changes in the company. Despite the dynamic character of the report, until 2002 they maintained a high degree of continuity, which makes it possible to follow the results and the performance over the course of time with comparable figures.

The knowledge goals defined for the years 2001 and 2002 were as follows:

- Knowledge Goal 1: Knowledge Transfer. ARC acts as a link between knowledge and application-oriented research and business science and government authorities. Accordingly, networks, consulting activities, publications, joint research and development projects, are the main activities developed.

- Knowledge Goal 2: Interdisciplinarity. The objective is to develop new technologies and comprehensive solutions to problems by understanding and linking together various different organizations of research disciplines. Accordingly, the organisation tries to ensure that the staff work on multidisciplinary projects and publications involving more than one business area or division.

- Knowledge Goal 3: Research Management. This goal is to introduce and implement modern methods of project assessment and research management and risk analysis.

- Knowledge Goal 4: Internationality. ARC promotes access to international networks and partners by establishing organizations abroad, and by entering into joint ventures and cooperation agreements.

- Knowledge Goal 5: Spin-offs & Investments**.** Oriented to create structures, processes and a corporate culture that facilitates the market-oriented exploitation of the R&D results in the form of new products and enterprises.

As has happened in other organisations, internal changes have taken place in ARC. In 2001, the Austrian Research Centers Holding was created as a joint organization composed of seven subsidiaries, the largest of which is the so-called ARC Seibersdorf research GmbH. Setting up ARC Holding meant an intense process of restructuring in the company, designed to make the organisation both more efficient and more effective (ARC, 2003). Until 2002, the Intellectual Capital Reports were designed and published for ARC Seibersdorf research GmbH but since then they have been prepared for ARC Holding.

Although, the changes in the organisation could mean that some indicators cannot be directly compared to those from the previous year due to restructuring measures in the company (ARC, 2003), the organisation has made every effort to build the indicator for each period, compare them over the course of time, assess the ongoing goal achievement and to establish the general trend of the indicators for the next period (an example of a few indicators are shown in the table 5.3). Hence, the figures, commentaries and interpretations of the goal achievements represent an important strategic controlling tool (ibid., 2003).

It is important to note that the parameters have been consolidated over the years, but the tendency has been to reduce the number of indicators originally discussed in the first ICR, to those that are most significant thanks to the experience the organisation has gained (ibid., 2003).

Table 5.3. Example of Comparative Indicators selected by ARC for the Human Capital of the Knowledge Goal: "research management"

Research Management	1999	2000	2001	2002	Goal 2002	Goal achieved	Goal 2003
HUMAN CAPITAL							
Human Resources							
Women in senior positions (%)			2.6	2.7	↗	☺	↗
Further education							
Total days training per employee	3.55	5.62	5.19	4.4	⇨	☹	↗
– Communication & management	1.4	1.68	2.12	2	⇨	☺	⇨
– Computer literacy	0.45	0.92	0.78	0.25	↗	☹	↗

Source: ARC (2003; p.13)

Having analysed and reflected on this experience carried out since 1999, Leitner & Warden (2004) consider that the model can be a suitable system to make the knowledge creation process visible in an organization, and would be useful for other institutions with similar goals and missions, such as other research centers and even universities (

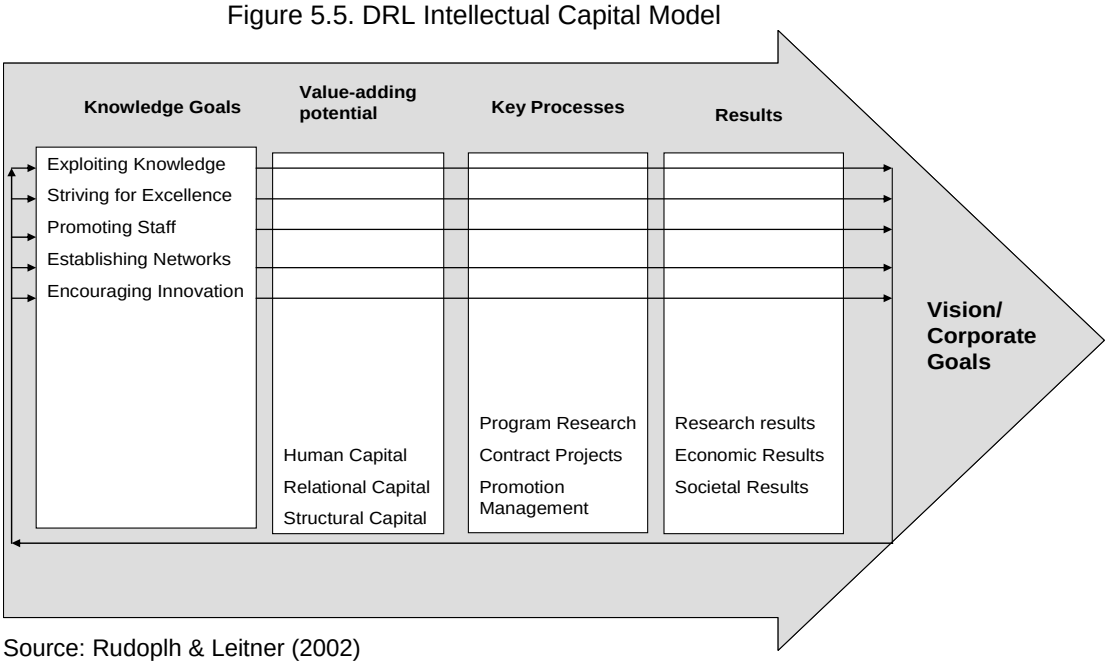
Indeed, ARC's experience has been so convincing that it has been accepted as a model by other knowledge-based companies and research centers and has also become established internationally as a reference.

One year after ARC´s first Report, in 2000, the German Aerospace Research Center and Space Agency (DRL) started to publish its own Intellectual Capital Report based on the same principles and approaches as ARC, although adapting the model to the special needs and context of DRL (see figure 5.5).

The initial stimulus to prepare an ICR was to up-date and supersede the Innovation Report[80] that DRL was publishing. Although the document reflected the results of the organisation, it lacked objectives, benchmarks and development trends. For that reason, it was not considered thorough enough to be a reference report for improving the internal management (Rudolph & Leitner, 2002).

[80] A Report that German public research organisations have to publish annually for Germany's Federal Ministry of Education and Research.

Figure 5.5. DRL Intellectual Capital Model



Source: Rudoplh & Leitner (2002)

The main consequence of applying a similar model is the potential to compare both ICRs and the organisations´ performance. Obviously, because the indicators are selected regarding the context and strategy of each organisation, not all indicators are equally significant for both organisations and they have to be interpreted contextually. However, "a set of common indicators has been defined, roughly 30% of all indicators are used by both organisations within their IC reports[81]" (Rudoplh & Leitner, 2002; p.10). Furthermore, as pointed out by the authors, working on the same IC model and indicators has provided a mutual learning process, beneficial for both organisations.

Finally, and even more importantly, is the impact of this experience on the Austrian university sector. As explained in the previous section, the ARC model was the main foundation of the ICR for Austrian universities, which will become mandatory by 2007 (see section 5.2).

5.3.2. The Innovation and Knowledge Management Institute (INGENIO)

The Innovation and Knowledge Management Institute[82] was created in 1999 as a joint initiative between the Spanish Research Council (CSIC) and the Polytechnic University

[81] For more information about the full list of comparable IC figures of both organisations for the year 2001, see the Appendix of the paper Rudolh & Leitner (2002).
[82] More information http://www.ingenio.upv.es.

of Valencia, with the collaboration of the Technological University of Venezuela (UNITEC).

The Institute took shape as a center for reflection and action, open to learning, and with three strategic research lines: Innovation Systems, Organisational Innovation, and Knowledge Management. The latter research field works on new approaches, methodologies and tools to analyse and generate models that enable them to explain knowledge processes inside organisations.

In the framework of the Second National Plan for Assessment of Quality in Universities, in 2002 an interesting research project was developed on the use of knowledge management technologies to improve quality management in Spanish universities (INGENIO, 2002).

The project aims to build a "*Knowledge Portal*" for Spanish universities (so-called PC2U-Portal de Conocimiento del Plan de Calidad de las Universidades). This tool should facilitate knowledge management through a set of "follow-up" indicators, identify "best practices" and disseminate them. The process developed allows the research group to understand the most important support elements and the main barriers against knowledge management systems within the Spanish higher education system. Accordingly, appropriate strategies can be defined, improving the quality of universities in a broad sense.

5.3.3. Intellectual Capital in Higher Education Institutions and Research Organisations Initiative

HEROs[83] (Intellectual Capital in Higher Education Institutions and Research Organisations*)*, is an initiative led by the members of the European Association of Research Managers and Administrators (EARMA[84]) in collaboration with the European Center for the Strategic Management of Universities (ESMU[85]) in 2002. Based on the IC experiences in the private sector, the main goal of the Project is "to raise awareness and disseminate good practice in the fields of managing and reporting intellectual capital among universities and research organisations" (Leitner & Warden, 2004). Its

[83] www.earma.org/WG/vimak/vimak.html.
[84] www.earma.org.
[85] www.earma.org.

underlying idea is that HE institutions and research centers have become increasingly familiar with the concept of intangibles in a knowledge-based economy where the economic impact of R&D activities is becoming ever more relevant.

This initiative intends to: bring together those people sharing interests in the topic, allowing them to exchange information and build a network; develop 'standards' for valuing and reporting IC by HEROs (considering their different contexts) to facilitate benchmarking analysis; and define a common set of indicators, from which individual HEROs can select those most appropriate for their needs, context, strategies.

One of the basic premises of this Project is that an organisation's intellectual assets are specific to the organization and their value and relevance depend on their potential contribution to the institution's key objectives. For this reason, a necessary starting point would normally be the definition and diffusion of the mission and strategic goals of the specific organisation. However, it is recognised that not all HEROs are at the same stage in the formulation of their Mission Statement (Warden, 2003), which could hinder the adoption of this Intellectual Capital approach.

A Working Group on this topic was launched at the EARMA Annual Conference in Budapest in June 2002: *VIMaK in HEROs* (Valuing Intangibles and Managing Knowledge in Higher Education and Research Organisations). This group was formally composed of approximately 50 members aiming to establish initiatives to drive forward the research on this issue and the diffusion of good practices across Europe.

5.3.4. PCI Project

The PCI Project (2000-2003) developed an Intellectual Capital Indicators Programme applied to the research activity in universities and research centers in the Madrid Community[86]. Four universities[87] and two research institutes[88]participated.

This Project aimed at studying how these organisations manage their knowledge in order to improve their processes and their relationships with other social agents, and

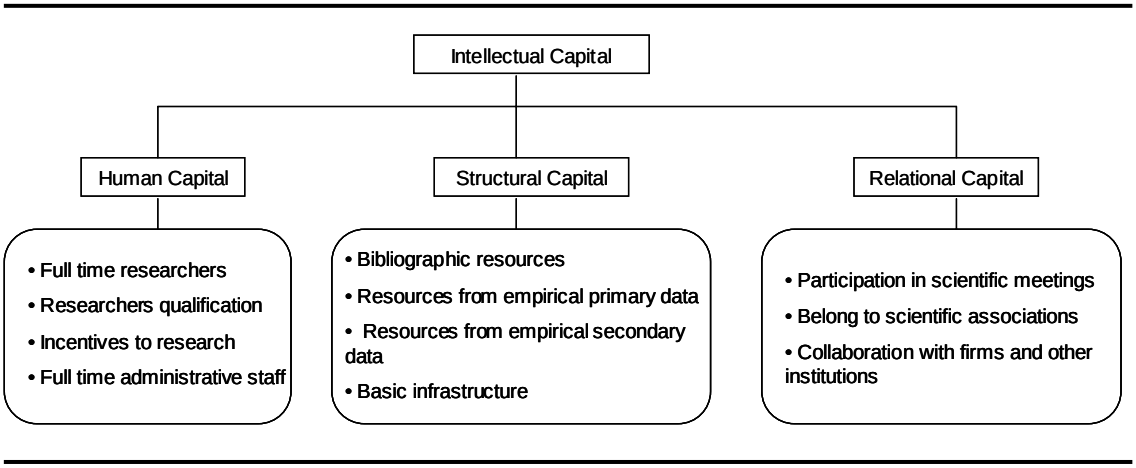
[87] Autonomous University of Madrid, Carlos III University, Polytechnic University and Rey Juan Carlos University.
[88] National Center of Biotechnology (CBN) and Energy, Environmental and Technology Research Center (CIEMAT).

how this information is disclosed to stakeholders in order to improve transparency (Comunidad de Madrid, 2002).

The starting methodological framework was the Intellect Model (Instituto Universitario EUROFORUM, 1998), which was adapted to the features of the research institutions, defining the variables that define each of the three categories of intellectual capital (see figure 5.3).

The model attempts to (1) establish the general characteristics of the research processes in these organisations, (2) root cause-effect relationships between inputs and outputs within the research process, and, finally, (3) suggest how to manage intellectual capital inputs to improve research outputs in universities and research centers.

Figure 5.6. Intellectual Capital Structure linked to research activity in universities and research organizations in the Madrid Community



Source: Rodriguez Pomeda et al. (2003)

5.3.5. Managing Technical Knowledge in the Basque Country University

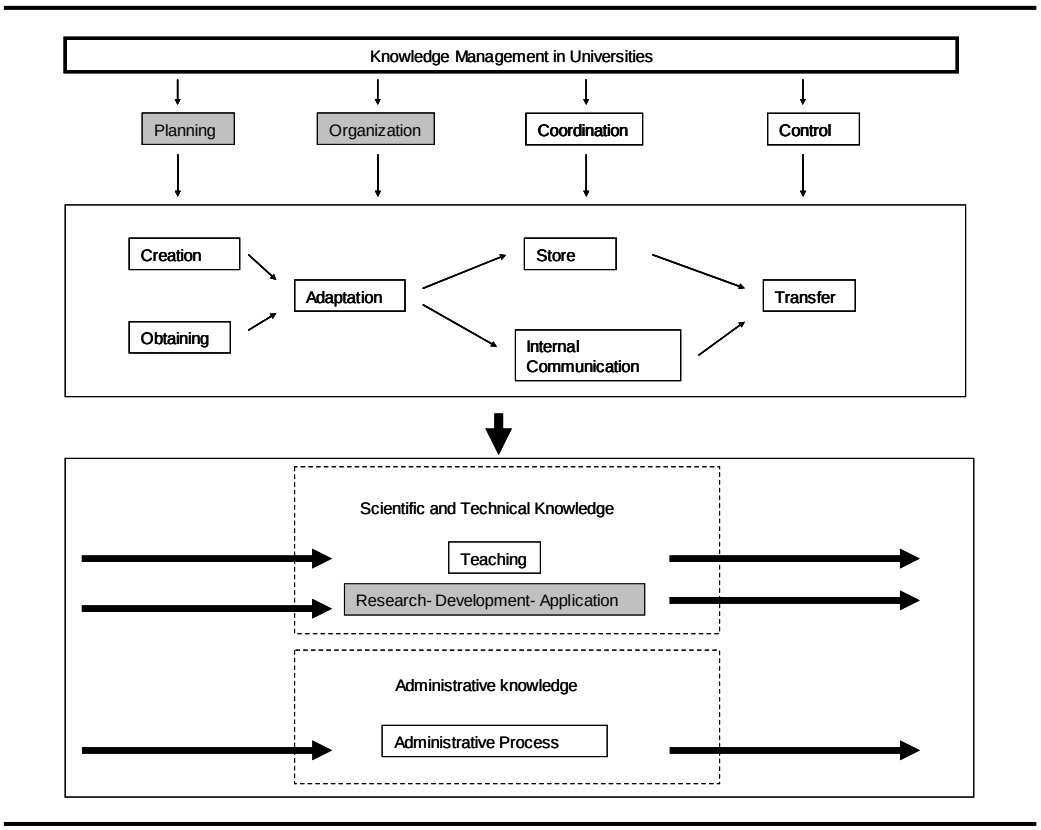
The University of the Basque Country (UPV/EHU)[89] has developed a knowledge management case-study project considering a key and strategic cross-organisational process: "Research-Development- Knowledge Transfer". To reach their objective, Multidisciplinary Groups in the Universities (GUM) have been created with the specific

[89] Universidad del País Vasco / Euskal Herriko Unibertsitatea

goal of building closer ties between university research and the real socio-economic context (Araujo, 2000).

From the analytical point of view, the knowledge management in universities is described as all the processes undertaken to increase their IC, "defining it as all the administrative, scientific and technical knowledge which generates or will generate benefits in the future" (Araujo, 2000; p.21). It was therefore created with the conviction that knowledge management in universities is crucial as a response to the new challenges that they have to face: defending their leadership position in the field of creation and diffusion of knowledge in an increasingly competitive context, searching for new sources of funding, etc. (ibid., 2000).

Figure 5.7. Knowledge Management in Universities



Source: Araujo (2000)

The project was developed in the following stages:

- Analysis of the existing models in similar institutions
- Identification of the key knowledge
- Diagnosis of the current situation

- Building a model for the process selected. This phase was the core of the project. Figure x shows a general schema of what is, or should be, the knowledge management within universities.
- Implementation of the model

Like other experiences, this project covers the broadest IC taxonomy taking in the three categories already mentioned: Human, Structural and Relational capital.

Although, the Basque Country University has initiated the project focusing on only one strategic process; the above mentioned "Research-Development-Knowledge Transfer" (printed in grey in the previous figure), it is willing to extend the project to the rest of the university processes (teaching and administration).

5.3.6. IC Model in ETRI

Although the analytical and empirical framework of this Thesis has a European focus, we consider of interest to give some insights into other experiences that are being developed in other contexts. Aware of the increasing importance of IC approaches in the Far East, mainly in Japan[90] and Korea, we will be looking into one of the most outstanding experiences: the IC Model developed in ETRI.

ETRI[91] (Electronics and Telecommunications Research Institute) is a Korean non-profit government-funded research organization under the Ministry of Science and Technology. It is the leading Korean institution on technologies in the field of information and communications, developing, among others, information technologies such as TDX-Exchange, High Density Semiconductor Microchips, Mini-Super Computer (TiCOM), and Digital Mobile Telecommunication System (CDMA).

ETRI, with its current name, was born when two institutes merged: the Korea Electronics and telecommunications Research Institute (KETRI) and the Korea Institute of Electronics Technology (KIET) founded in 1977 and 1976, respectively.

[90] See Japanese Guidelines description in Chapter 2, Section 2.3.3.
[91] www.etri.er.kr.

Its mission seeks “to contribute to economic and social development by creating and developing new knowledge and technology as a member institute of the Korea Research Council for Industrial Science & Technology” (ETRI, 2005; p.4).

According to data published in their Intellectual Capital Report 2005, ETRI has 2,433 employees, 37.1% of them holding PhD degrees. It is ranked among the top 4.6% in national investigation on transparency and accountability (ETRI, 2005; p.7)

At the beginning of 2001, ETRI made their first attempt to develop an efficient managerial tool and establish a knowledge management system. The main goal of this system was to store, create, share and disseminate knowledge. After a few years, and still very concerned about how to improve internal management, they moved from knowledge management systems to an IC approach, developing their first Intellectual Capital Report in 2004 (based on the performance of the previous year 2003).

After this first attempt, ETRI has continued to publish ICRs annually, which have enabled them to make internal comparisons and assess the organisation’s performance over a period of time.

According to the information disclosed on the web site and in its ICRs, ETRI´s rationale for using ICRs has been twofold: improving its internal management, and reporting IC information to its stakeholders. In order to develop the model and to learn from the process, an Intellectual Capital Team was created in 2004, and experts from abroad helped to analyse its unique aspects and to build indicators that reflect its idiosyncrasies.

The indicators-based IC measurement model follows the general IC taxonomy and includes different headings in each of these sub-categories:

- Human Capital: Employee competence, work attitude, employee satisfaction and employee retention.

- Structural Capital: Technology innovation, infrastructure, intellectual property rights, and organizational culture.

- Relational Capital: customer satisfaction, ETRI brand, R&D network, and R&D value creation.

The 2005 ICR includes 42 indicators and 65 sub-indicators in an effort to keep consistency with previous reports and relate current strategies and corporate goals.

5.4. Some Conclusions

Like other kinds of organisations moving in the knowledge-based economy, contemporary universities are immersed in far-reaching transformation processes which pressure them their behaviour, culture, internal structures and management systems.

There is general consensus in the specialised literature about the idea that adapting to the new requirements implies the introduction of management systems, traditionally used by private companies, in order to govern universities following efficiency and effectiveness criteria.

However, it is important to take into account that universities are complex organisations with specific characteristics that make them unique. As pointed out by Sporn (1999) the distinguishing aspects of academic organisations are: goal ambiguity, client service, task complexity, professionalism and administrative values, and environmental vulnerability. In addition, they have to deal with specific external constraints such as the changing role of the state, public budget pressures, and new societal demands for accountability and transparency.

All this means that we have to be cautious when applying business tools and approaches to universities (Sporn, 1999). There is a “tendency to borrow management and governance models from the private sector without any change to their design or use” (Meister-Scheytt & Scheytt, 2006; p.23). In order to avoid potential problems, universities, as a specific type of organisation, should adapt the management systems to their own characteristics.

As described in this chapter, **intangibles and IC in universities and research centres were becoming a mayor issue not only for academics but also for practitioners and politicians during the 90s**. This growing interest is being translated into different initiatives with different implications and impact on university governing structures and transparency.

Even though assessing a university's outputs and inputs is not a completely new idea, implementing IC approaches within HE institutions means one step forward. The identification of the three forms of IC (human, structural and relation capital), their links with the knowledge production processes, the organisation's strategic objectives and the definition of a battery of indicators, simultaneously improve internal management and transparency. We can therefore define the ICR as a tool for comprehensively visualizing inputs, outputs and processes. Furthermore, as stated by Leitner (2004; p. 137), "a proper management of IC at universities has a significant impact on the performance and efficient use of the invested financial funds". Hence, practitioners and experts on this topic affirm that those academic and research organisations able to develop both the culture and the capacity to identify, manage and report on their IC, will be advantageously placed in the HE scenario.

This chapter has examined the **rationale of implementing IC approaches in HE and research institutions** and presented the most outstanding experiences across Europe, and other international experiences like ETRI, clearly distinguishing between the case of Austrian universities that have to implement ICR by law and other successful initiatives developed in different HE institutions on a voluntary-basis. By doing so, we reflect on the potential benefits and drawbacks of different models and indicators co-existing, and try to give some insights into the recent debate "voluntary approach versus mandatory basis" and contribute to answer the following research questions:

What is the rationale behind recommending universities to identify, manage and disclose their IC?; Are IC approaches useful in understanding and improving the internal management process within universities?

On one hand, the Austrian experience shows that it is possible to create a radical shift within the university sector through changes in legislation. UOA1993 and UG2002

aimed to increase universities' institutional autonomy creating new governing bodies and introducing new management systems. Making it a legal obligation for universities to submit an ICR every year is a crucial step in the proliferation of IC models world-wide, not only for management purposes but for disclosing information to stakeholders. Having homogeneous ICRs throughout the country will facilitate benchmarking analysis and comparative studies which will help the decision-making process and improve the articulation of public policies. However, as the trials developed in the University of Vienna show, the law cannot prevent problems, difficulties and conflicts of interest in the implementation process. For this reason, a cultural change in the academic community is required in order not only to accept changes in the governing structures, but new ways of working, new assessment processes, new labour positions, and new accountability at all levels. In other words, accepting a new conceptualisation of university will require more than a top-down reform.

On the other hand, the increasing awareness of the importance of measuring, management and reporting on intangibles has led some universities and research institutions to build their own model voluntarily. The models presented in the previous sections are a good example of the endeavours that some leading organisations are making towards better management and more transparency. Since it is a self-imposed initiative in these cases, it is not expected that the implementation process of the IC model will represent a problem and the institution will really learn from the process. However, the proliferation of different models with different approaches and different sets of indicators will not mitigate the problem of comparability among institutions.

When analysing these experiences, these two important research questions arise: What are the benefits and obstacles of implementing an IC model in HE institutions? Shall we base the introduction of IC models and reports on a voluntary or mandatory basis?

In our opinion, the experiences described in this chapter prove that the IC approaches are useful for both internal and external communication. When applying them, the most important **positive effects or benefits** that universities can obtain are similar to those obtained in private companies. The most significant are:

(a) On an **internal level**, the IC model/report:

- Defines and updates the mission statements of the HE institution
- Helps to identify priorities in terms of research and teaching activities, clearly defining the organisation's profile.
- Communicates strategy throughout the organisation.
- Allows the alignment of individual goals within institutional objectives.
- Links strategic objectives to long-term targets and annual budgets
- Promotes an internal process of learning about the institution's structure and performance.
- Facilitates strategic discussions among the members of the organisation.
- Enables the discussion on the intangible value drivers and success factors.
- Monitors the achievement of goals and assesses the organisation's performance over the course of time.

(b) As a **disclosure tool**:

- In general terms, it improves the level of transparency
- It provides comprehensive and valuable information to stakeholders: students, teaching personnel and researchers, Ministries, funding organisations, businesses, and society as a whole. In the case of Austrian reform, the ICR is explicitly recognised as a communication tool between universities and the Federal Ministry.
- It can enhance competitiveness. For instance, when a University needs to renew a grant or attract additional funds for research, assessing performance is of crucial importance. Accordingly, the ICR can facilitate the presentation of results, which could contribute to attracting funds to the detriment of other lower-performing competitors. However, if the university is deteriorating, disclosure may prejudice the chances of getting future grants.

However, adopting management systems from the sphere of private companies is not always easy given the traditional behaviour of universities. For instance, although the aim of the implementation of the ICR is to improve internal management and provide more detailed information to stakeholders, some universities can limit their commitment to publishing a set of indicators without really learning about their knowledge creation

value and lacking a definition for strategic priorities. Indeed, there is a high risk of using the ICR only as a mechanism for funding allocation, as may have happened in the Austrian case. Defining a mission statement and strategic objectives, the basic premise for any profit-making organisation, is still a novelty for many universities. So even though it is not a direct goal of the reform to encourage universities to define their research priorities and strategic lines, the process of implementing ICR forces HE institutions to go one step back and start identifying their mission, vision, and key processes. Otherwise, the final result will be a set of meaningless indicators which do not provide comprehensive information about the institution.

Among the **obstacles or critical aspects** hindering the evaluation of intangibles within HE sector, we can observe:

- The diversity and heterogeneity of fields, areas of knowledge, disciplines, even within the same University, which makes it difficult to have a unique ICR for the whole institution. The aggregation of indicators on the organisational level is problematic if the organisational units are heterogeneous, and could lead to a pointless report unable to draw a real picture of the institution.
- Contrast between classical or traditional university culture and innovative universities could lead to a senseless benchmark analysis.
- Although there is a general trend within HE institutions to define and develop strategic plans and mission statements, they are not all at the same stage of formulation.
- Use of only a set of indicators, missing out the descriptive elements. In our opinion, the interpretation of the indicators is crucial, and contingent on the context and aims of the organisation/unit.
- The possible manipulation of data, as pointed out by Altengurger & Scahffhauser (2006), could be a risk that should be compensated with the introduction of auditing and control mechanisms. The performance agreement developed between universities and ministries or local governments (as in the Spanish, Norwegian and French case) is a funding allocation mechanism. Thus, it can be considered a `zero sum game´ which means that if one university gets more funds because of its better performance, it implies that another will get less, and there is, at least, a temptation to manipulate data to get better results, and, thus, obtain more

funds. In order to prevent this manipulation which could pervert the system, external auditing of data is crucial.

- Finally, another issue that becomes specially relevant when talking about reporting IC information in universities is time. In all the experiences analysed, the ICR is published annually following the financial year. However, in Europe, the academic year does not correspond with the financial year. Furthermore, research activity is often, if not always, long term. Both situations make it difficult for the data collection process and the presentation of information in a ICR to be made every year.

Regarding the debate, "**unique and mandatory model versus different models based on a voluntary approach**", it is not so simple to adopt a clear position.

On one hand, the obligation to report on IC with a common battery of indicators facilitates comparative analysis among faculties and universities, increasing transparency in the whole HE system. Moreover, university ranking could be calculated based on homogeneous criteria[92]. Finally, the possibility of publishing additional indicators will benefit external agents, mainly funding agencies, in their decision-making processes (Leitner, 2004).

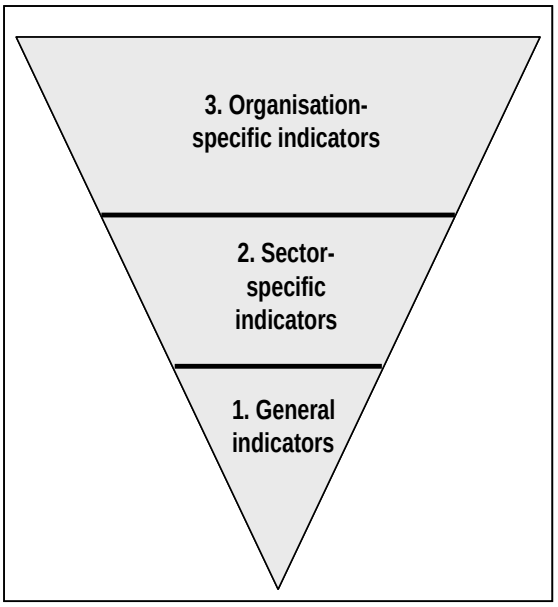
On the other, it is crucial to understand that IC assets are context specific. Accordingly, each institution should identify their own key intangibles according to the contribution to the value creation process and taking into account the strategic objectives. This could lead us to think that it would be better to build specific models for each organisation, which only could be done with voluntary initiatives.

Summing up, we can affirm that the initiatives outlined in this chapter can be considered the first step for the definition of a more general and homogeneous model that could compare institutions across Europe. However, since IC Reports are designed around the specific characteristics of each organisation, standardization is difficult. Indeed, as it is argued by the OCDE (2001; p.18), ICRs "should be prepared in line with the specific features of each organisation. There is no one-size fits-all formula". So far, there is no standard model and commonly defined battery indicators, and thus at present comparisons are limited.

[92] Most international university rankings are criticised because of the methodology used, as happened with Shanghai's ranking, for instance.

The issue of standardization on the measurement of IC is considered an important issue by the European Commission (2006b). Accordingly, the RICARDIS document explains how important it is to achieve general and homogeneous standardization to help comparability, interpretability and information credibility. When referring to companies, it proposes three levels of indicators, as shown in the following figure (ibid. 2006b).

Figure 5.8. Levels of Standardization of IC Indicators



Source: European Commission (2006b; p.111)

Regarding this proposal for standardization, we should consider the basic set of indicators as those that are mandatory for all organisations and institutions, for instance, related to funding. Using the same thinking, there would be a set of sector-specific indicators (only mandatory for them), as for instance, degrees of autonomy, which would be of more interest to universities than private companies. Lastly, organisation-specific indicators can be chosen by each company or institution taking in individual considerations.

In order to contribute to the empirical work on this file and help universities to identify, manage and disclose their IC information, the next chapter will present the main on-going endeavours at European level to provide analytical frameworks to better understand the European HE sector and institutions: the Aquameth Project and the Observatory of European Universities (OEU). Furthermore, our fieldwork has been developed following multiple case study analyses. Four case studies have been developed in different European universities and research centers.

6. DEVELOPING STRATEGIC MANAGEMENT IN EUROPEAN UNIVERSITIES

As explained in previous sections, the increasing awareness of the relevance of HE institutions in the creation of the Europe of Knowledge is leading different initiatives to foster excellence in universities and research centres. Despite the political endeavours to create the ERA and the EHEA previously described, the HE system in Europe is still organised according to national and regional structures. Due to this, the European university panorama is mainly characterised by a "high degree of heterogeneity which is reflected in organisation, governance and operating conditions, including the status and conditions of employment and recruitment of teaching staff and researchers" (European Commission, 2003a; p.5).

According to the idea that "the nature and scale of the challenges linked to the future of the universities mean that these issues have to be addressed at European level" (ibid., 2003a; p.10), the analysis of HE institutions has been a major concern in the PRIME Network of Excellence[93], especially in connection with the building of indicators. Within this Network, two major projects dealing with HE institutions have been developed. On

[93] PRIME stands for Policies for Research and Innovation in the Move towards the European Research Area. It is a network of excellence to develop long-term research and shared infrastructures on policies for research and innovation in the move towards the European Research Area (ERA). PRIME represents49 institutions, 230 researchers and 120 PhD students from 16 European countries. It has specialised in fomenting the development of lasting cooperation and integration. Prime is managed by a 12-member executive Committee elected by the members' governing board and supported by a 6-member scientific Committee. For more information see: www.prime-noe.org.

one hand, there is the AQUAMETH project aimed to integrate a battery of indicators using secondary sources of information in a joint database to allow benchmarking analysis at the national level. On the other hand, the Observatory of the European University (OEU) project which was created using a bottom-up approach to better understand European universities and to improve university strategic management.

In this Chapter, we describe both initiatives, stressing their most important objectives, outputs and methodological shortcomings. Furthermore, although both projects deal with different objectives, we highlight that both initiatives are highly complementary.

6.1. Mapping and Clustering Universities at European Level

The Aquameth Project (June 2004-December 2006[94]) stands for Advanced Quantitative Methods for the Evaluation of the performance of public sector research. It is a European Project created within the PRIME Network of Excellence, and funded by the VI Framework Programme. Using secondary sources of information - mainly from national statistic agencies, Rectors' conferences and individual university databases -, the project has addressed the issue of differing university profiles. Its main aim has been to characterize the way in which universities use their inputs to position themselves in terms of different outputs - teaching, research and third mission- while keeping efficiency under control.

The overall goals of the project are:

(a) To build an integrated dataset of micro-data at the level of universities in a number of European countries: Italy, Spain, Portugal, Switzerland, Norway and United Kingdom, covering 270 universities. The data analysed covers the period 1995-2003. The project is planning to extend the analysis to other countries, like France, Germany, Netherlands and Hungary in future phases.

(b) To discuss in detail institutional differences and to establish conditions for comparative studies and for integrated cross-country data treatment.

[94] In November (2006) a new proposal for the third phase of the project was presented to the PRIME Network.

(c) To carry out several econometric analyses on the integrated dataset, using both parametric and nonparametric techniques, addressing a number of highly debated issues in the HE policy agenda. Particularly, trade-offs between research and teaching, between undergraduate and postgraduate teaching, between publications and patenting and between research and third mission activities.

(d) To exploit the potential of new robust nonparametric techniques for the measurement of relative efficiency in European university production[95].

Accordingly, the project has developed a set of *positioning indicators* at university level in order to locate the university in a multidimensional space. However, it is important to note that, as opposed to ranking exercises, the indicators proposed by the project are built for institutional learning purposes.

Three categories of comparative problems have been defined: (a) the institutional context: mainly focusing on the differences in the internal organisation and governance structures of several national HE sectors; (b) heterogeneity of disciplines and fields of knowledge covered by each university; and (c) methodological and data problems.

From a micro-level point of view, the Project was able to track the position and evolution of universities with respect to the following structural elements:

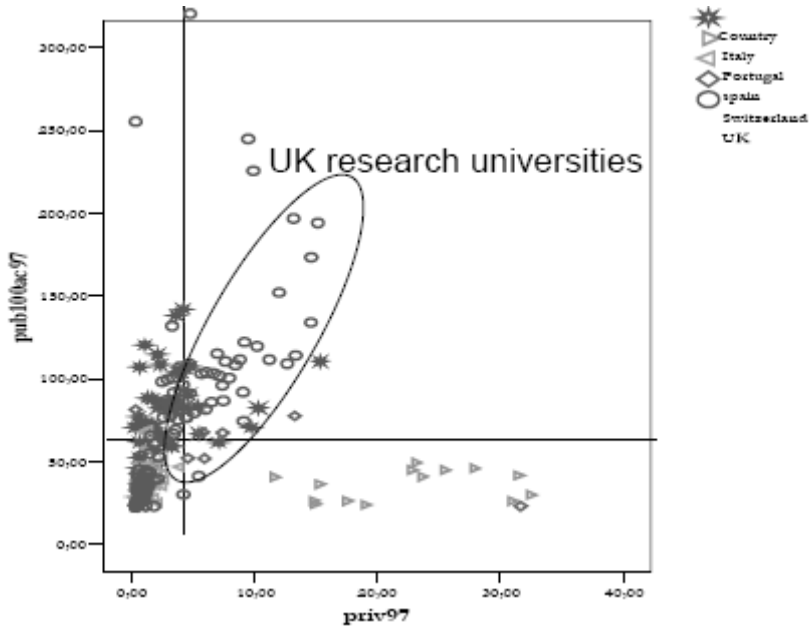
- "Research orientation", as measured by the share of PhD recipients over the total population of undergraduate students.
- "Research intensity", considered as the average number of publications per unit of academic staff.
- "Offering profile", in order to introduce the distinction between generalist and specialist universities.
- "Rate of growth" in total number of undergraduate students.
- "Degree of autonomy", as measured by the ratio between non-government funding sources and total funding.

One of the main contributions has been mapping and clustering universities using different techniques for representation. As an example, the figure below illustrates the position of each university participating in the project regarding their scientific productivity and share of private funds. As we can observe in the graph, national

[95] For further details about relative efficiency measurements see Bonaccorsi & Daraio (2007). See García-Aracil (2006) for relative efficiency of Spanish public universities using "Data Envelopment Analysis".

patterns can be defined. This information could be very useful for policy makers as well as university managers when designing strategic plans.

Figure 6.1. Scientific Productivity vs Share of Private Funding



Source: Bonaccorsi & Daraio (2007)

6.2. A tentative Managerial Framework for European HE Institutions: Observatory of the European University[96]

Simultaneous to the aforementioned Project, the Observatory of the European University (June 2004 - December 2006) has been developed within the PRIME Network of Excellence and also supported by the VI Framework Programme. Its main aim has been to better understand the importance of managing intangibles in public universities in order to improve their quality and competitiveness. However, being aware of the existence of different evaluation systems across Europe and other endeavours to assess research activity, the Project has not tried to build another assessment exercise, but to provide universities and research centres with the necessary tools and instruments for the strategic governance of research activities. In

[96] This Section is based on the discussions held in the different OEU International Meetings: Pisa (July, 2004), Manchester (January, 2005), Lausanne (February, 2005), Madrid (April, 2005), Budapest (December 2005), Paris (June, 2006) and Lugano (November, 2006) and in the final OEU document (2006) "Methodological Guide".

other words, to build a framework useful for university managers oriented, not towards accounting, but to facilitating strategic decisions.

Sixteen universities and research institutes from eight different European countries (see table below) have been working together to develop a common framework of analysis and build a battery of indicators to measure and compare the intangible elements related to research activities. Conscious of the complexity and multi-functions that characterise contemporary universities, the Observatory decided to start with the research activity, even though the general aim of European universities would be to extend the Project to teaching and other activities in the future. The resulting framework has been built using the existing documents and procedures to generate data within each institution, while trying an effort to limit the cost of data collection.

Table 6.1. Participant Universities and Countries

NAME OF UNIVERSITY	COUNTRY
Ecole nationale des Ponts et Chaussées	France
Université de Marne-la-Vallée	France
Université de Bourgogne	France
University Paris-Sud	France
Humboldt-Universität Berlin	Germany
Ludwig-Maximilian-Universität München	Germany
Budapest University of Technology and Economics	Hungary
University "G. D'annunzio" of Chieti Pescara	Italy
University of Bologna	Italy
Università Ca' Foscari Venezia	Italy
Maastricht University	Netherlands
Universidade de Aveiro	Portugal
Universidad de Granada	Spain
Autonomous University of Madrid	Spain
Ecole polytechnique fédérale de Lausanne	Switzerland
Université de Lausanne	Switzerland

Source: Observatory of European University (2004)

The Observatory defined two groups of participants that have closely interacted throughout the Project. On one hand, the *University Panel*. This was composed of

representatives of European universities (mainly top manager positions Board of Governors), invited on an experimental and voluntary basis who were directly involved in collective discussions. Their involvement was considered a pre-requisite for the development of the Project. Moreover, the close collaboration with university administrative services was crucial for the data gathering process. On the other hand, the *Research Team* composed of the PRIME members who have been in charge of developing the common framework and data gathering.

For the configuration of the Project and the internal dynamics, it is considered that the OEU had a bottom-up approach.

In order to provide a comprehensive and shared structure, and as a result of the joint work done by the research team and the participant universities, an analytical bi-dimensional framework was created. It is organised to encompass five thematic dimensions and five transversal questions that reflect the key or strategic questions related to the management of research activity.

The “Thematic Dimensions” selected are:

- Funding: all budget elements, analysing revenues and expenses.
- Human Resources: administrative staff, researchers/teachers and PhDs.
- Academic Production: results from research activities in all the fields: articles, academic publications, non-written results, and the knowledge embodied in PhDs.
- Third Mission: all the activities and relations between university and non-academic partners: firms, non-profit organisations, public authorities, local government, and society as a whole.
- Governance: the process by which the university converts its inputs (funding and human resources) into research outputs (academic outcomes and third mission). Given its qualitative profile, it should be approached mainly as a characterization issue.

The “Transversal Issues” considered are:

- Autonomy: the university margin for manoeuvre is analysed. In other words, the degree of freedom the university has to allocate resources or to use funds.
- Strategic Capabilities: the university’s real ability to implement its own strategic choices.

- Attractiveness: the university's capacity to attract resources (finances, people, equipment, collaboration, etc.) within a context of scarcity.
- Differentiation Profile: the main features of a university which distinguishes it from the other strategic actors.
- Territorial Embedding: geographical distribution of university involvement, contacts, collaborations, etc.

As a result of the interactions of the aforementioned issues, a "Strategic Matrix" (see table 6.2) has emerged. Each cell of the Matrix contains various key questions and a set of indicators. The two-dimensional matrix is the result of an intense interactive process between university representatives and research team groups in the Observatory and is expected to facilitate the analysis of university research management. This structure should be a valid instrument to characterise research activities in European universities, facilitate a common framework to compare them, help universities to assess their strategic strengths and weaknesses over time, and identify the best performing universities. Notice that, in line with the main goals of the OEU, the Strategic Matrix and the battery of indicators proposed have been designed for management purposes and are not stakeholder-oriented. In other words, the indicators have been conceived to aid strategic management of research activities. As will be explained later, to cope with the need to diffuse more information to external agents and increase transparency, an Intellectual Capital Report especially designed for universities has been developed.

Given the ambitious scope of the Matrix, each university has agreed a particular status of work within the Project: (a) Proactive: universities willing to participate actively in the definition of key questions, strategic objectives and indicators and in the data collection process, (b) Follower: universities that will implement the results produced by the proactive members, (c) Observer: universities that are just being kept informed, without any real involvement.

Thanks to the pro-active institutions, the Observatory was able to define the indicators and to test the interest in those proposed and their feasibility. Lastly, regarding quantitative indicators, following the MERITUM Project's recommendations they have been checked against the following set 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.

- 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 producing them 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.

Summing up, from the conceptual point of view, the Strategic Matrix can be considered an easy instrument to characterise research activities in universities using two dimensions. Thus, the main users are university managers. When applying this analytical framework universities reflect on their internal key issues, where they are and where they would like to be, and on their strategic objectives and decision-making processes. Despite the fact that the Matrix's main aim was to improve internal management, it can also facilitate benchmarking analysis across Europe and the definition of best practices.

Table 6.2. Analytical Framework of the Observatory of European Universities: Strategic Matrix

	Funding	Human Resources	Academic Outcomes	Third Mission	Governance
Autonomy	What is the degree of freedom the government enjoys in the use of government funding? How significant is the portion of nongovernmental funding that goes to research?	What freedom is there to: • create new positions? • recruit and allocate staff? • specify staff duties ?	Does the research portfolio reflect the university's strategic choices of scientific fields or does it result mainly from national or European Framework Programmes for RTD priorities? What are the university degrees of freedom to evaluate the quality of Academic Outcomes?	What are the university structures in charge of the management of relations with non academic partners (transfer office, etc.)? What investments has the university realized in the process of its third mission (science parks, incubators, museums, etc.)?	How much autonomy does the university have in elaborating its SRP? What is the autonomy of the university in defining the content of the SRP, regarding external frameworks, procedures, priorities? How much autonomy does each level have in the definition of a SRP?
Strategic Capabilities	What is the amount of resources devoted to research activity? How diverse is the funding basis for research?	What freedom is there to: • create new positions? • recruit and allocate staff? • specify staff duties ?	What leverage does the university have to set scientific agendas in the various fields in which it is active?	How is the third mission presented in the SRP? What us does the research staff make of the transfer office?	To what extent does the university have the ability to make strategic decisions and resource allocations according to the SRP, and to follow up and readjust? To what extent does the university have to implement innovative research areas according to the SRP? To what extent can each level impact the SRP?
Attractiveness	What is the fund-raising capacity of the university? Which kind of external sources does the university attract?	How Attractive is the institution for future and for qualified researchers? How much attractive is the university for research students at PhD level?	What scientific partnerships appear in the university's co-publications networks? What are the university's scientific partnerships as ? What scientific partnerships patterns appear in the university's portfolio of participation in and coordination of international research programs?	What laboratories of non-academic actors are located on the university premises? What are the research collaborations with firms and non-academic public bodies outside the university premises?	
Differentiation Profile	What is the structure of the budget by scientific fields and by type of research (basic, applied, R&D)? What is the structure of the university's own resources that are allocated to and derived from research by scientific fields and type of research?	Is the institution clearly specialized in training of PhDs? What profile does the university choose for recruitment?	In which field does the university publish the major part of its scientific articles? In which fields does the university publish the main parts of its "non articles": books, chapters, e-journals? What are the main instances of academic recognition that have been awarded to university researchers?	What are the main focal points of non academic collaboration for the university, in terms of industrial, cultural, and social relations? What are the unique facilities and/or services located on the university premises and open to external actors?	Does the content of its SRP distinguish the university from other institutions?
Territorial Embedding	What is the geographical origin of research funding? What is the geographical origin of funding for young researchers?	Are there mobility-enhancing activities? Is there regional support for training researchers? Is there regional support for recruiting qualified researchers?	What are the main geographical levels of scientific cooperation for the university? Where do the university's PhDs students come from and where do they go to after completion of their PhD?	What are the main geographical levels of the university's industrial relation? What are the main geographical levels of involvement in policy and public debate for the university for shaping / accompanying regional/national/ international policies? What specialised structures of the universities are open to the public (law shops, legal advice, museums, libraries, etc.)?	What are the degrees of participation of the different actors at different territorial levels of negotiation and influence? • What are the needs to which (or objectives) the content is related to?

Source: Observatory of the European University (2006)

In addition, another output of the OEU Project is the "Methodological Guide" (OEU, 2006). This document provides a tool for the application of the Strategic Matrix within non-participant universities, in order to manage them strategically. Every thematic dimension is analysed separately including a methodological proposal for its particular characterisation. Furthermore, all the problems in data-gathering are addressed, in order to guide university managers to characterise their research activity profile and to help them in the data-gathering process.

6.2.1. Talking in terms of Intellectual Capital: the ICU Report[97]

In addition to the aspects mentioned in the previous sub-section, the OEU has included in its final document one chapter especially devoted to the *Intellectual Capital Report for Universities*[98] (ICU Report hereafter). The ICU Report is a comprehensive way of reporting intangibles information following IC approaches. While the methodological guidelines aim to improve internal management, the ICR is focused on improving transparency and helping to diffuse IC indicators in a homogeneous way. The Report has been developed by the UAM´s research group in the conviction that disclosure is the natural step after management, and the use of the IC approach and terminology will provide the greatest potential impact at the political and organisational level.

Although the OEU analytical framework is a valid tool for the characterisation of research activity in universities, there has never been mention of its being used as part of the Intellectual Capital approach. However, the Observatory's objective of providing actors with tools to improve internal management and benchmarking and the aims of the IC models are very similar. Comparing the latter goals or missions and the expected benefits of the IC Report on the one hand, and the OEU Matrix on the other, we have identified notable similarities and basically a difference in terminology.

As argued before, we consider that the approach taken in the OEU is completely valid from the analytical point of view, but greater impact and usefulness can be achieved by using IC terminology for the three following reasons. Firstly, as argued in previous

[97] This sub-section is based on Sánchez et al. (2006a), "The Intellectual Capital Report for Universities", Chapter VII of the Methodological Guide of the Observatory of European Universities. This document has been our special contribution to the Project and its final document.
[98] To see the ICU Report and the set of indicators see Annex I.

chapters, there is a vast amount of literature that supports the growing importance of IC in international circles and the use of IC language is increasingly used not only by firms in all sectors but by different public organisations (healthcare institutions, cultural organisations, research centers, universities, etc.). The argument Marr uses for companies may also be applied to Universities: “any company producing intellectual capital reports today is an innovator and early mover. The reasons for reporting might be to gain advantage for being recognized as an innovator, and therefore these reports might act more as a marketing tool than a serious reporting tool. Intellectual capital statements may help communicate the importance of employees or partners, which in turn might attract new employees or partners, and in some cases it may even attract customers” (Marr, 2005; p.79). Secondly, using terms related to IC can have a bigger impact in European circles, especially in the political arena. Indeed, the European Commission (2006) recommends using IC terminology by publishing ICRs not only in the private sector but also in the public one, especially in universities. Finally, to work in line with the pioneer experiences which are being developed across Europe in different institutions (see chapter 5).

To sum up, bearing in mind the international high-profile of IC approaches and perspectives, it would be more consistent to use IC and intangibles language within the Observatory in order to gain support and visibility world-wide.

Accordingly, in our opinion, the Strategic Matrix can easily be expressed in an IC framework, with little adaptation. The following graph depicts the relation between the goals of the OEU matrix and the IC Report.

Table 6.3. Comparison of OEU Matrix and the IC Report similarities

OEU MATRIX	IC REPORT
Improving internal management	Complementing financial management information (internal management function)
Facilitating Benchmarking analysis across Europe	Complementing financial statement (external reporting function)

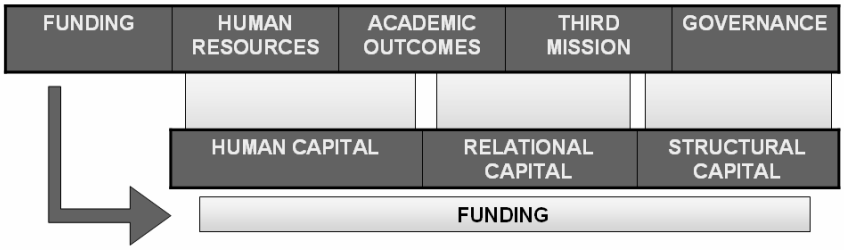
Source: Castrillo (2006; p.39)

An exhaustive analysis of the axes of the current OEU matrix was undertaken in order to adapt the thematic dimensions to the Intellectual Capital scheme (Human Capital,

Relational Capital and Structural Capital). As shown in the next figure, the translation scheme follows the direct relationships between concepts[99].

Except for the dimension related to "funding", the rest of the OEU dimensions can be translated directly into IC language. "Funding", however, is not easily included in any of these three categories, but embedded in and affecting all of them. It includes all budget elements, analysing revenues and expenses. Thus, we propose to take Funding out of the horizontal axis and include it in the transversal issues. So far, it has been used as an aggregate of smaller and important issues. Although we consider that this treatment has been valid from the analytical point of view, this broad category could be split in order to get an improved and more detailed analysis.

Figure 6.2. Proposed adaptation of Thematic dimensions into the IC categories

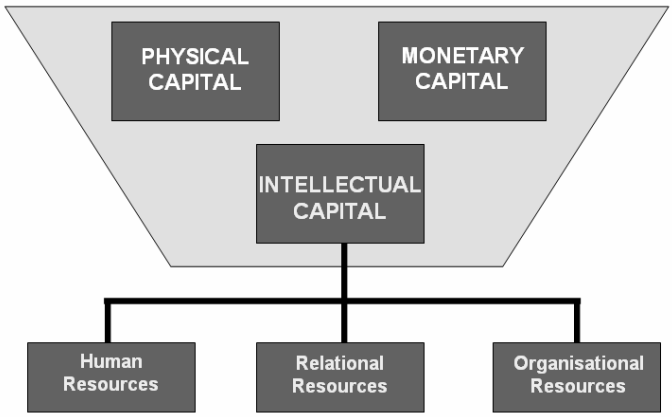


Source: Sánchez et al. (2005)

Indeed, previous literature states that both the financial and physical capital are different factors and separated from Intellectual Capital. The monetary or financial capital, a key resource for any institution, is not usually considered part of the Intellectual Capital. Accordingly, Marr & Roos (2005), when referring to firms, highlight the dynamic interaction between this asset and other resources. Such interaction is essential to deliver organisational performance. Budget is considered an input as well as an output of Monetary Capital. Moreover, the mentioned authors state that it is the interaction among the different types of capital that creates wealth within an organisation. In line with this, we consider that the budget could report more interesting information when crossed with the categories of Intellectual Capital.

[99] Each category has been broken down into key questions and indicators. A detailed description of how they correspond is given in Sánchez et al. (2005).

Figure 6.3. Taxonomy of Organisational Assets



Source: Marr and Roos (2005; p.32)

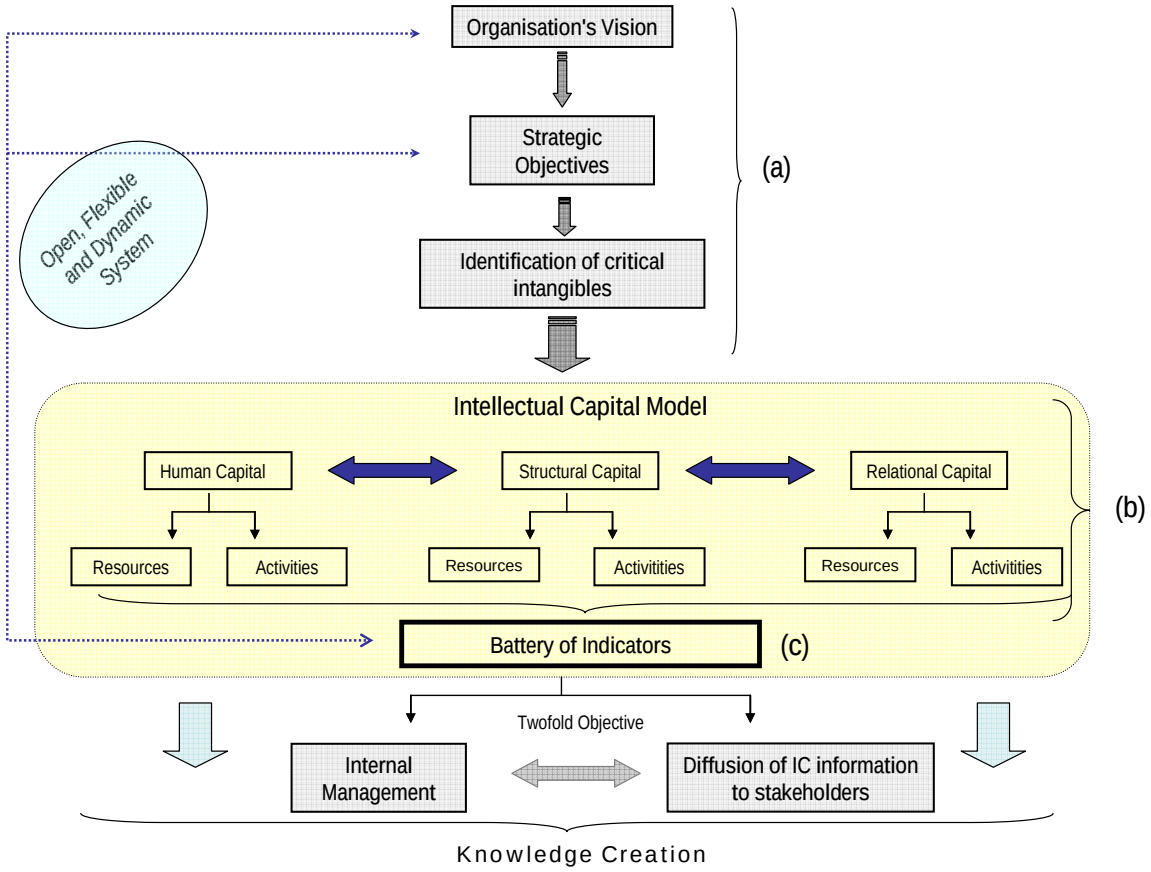
Interestingly, when referring to universities and research centers we have observed during the empirical work that funding is being considered increasingly not only as an input but as an output of research activity. On one hand, considered as an input, funding should be analysed in terms of efficiency, transparency regarding where funds are used, how they are accounted for and the degree of autonomy of the institution to allocate them regarding internal priorities (Castrillo, 2006). On the other hand, funds can be considered as outputs of research activity since universities increasingly receive funds as a result of this activity. In other words, the funds devoted to research are obtained for competitive and non-competitive projects presented by individual researchers and research groups. With this perspective, funding could be considered a measure of the success of research activity in each university. The more projects a university gets the more finances it will receive. Performance agreements that link funding with scientific results are stressing the importance of funding not only as necessary input to develop better research but an output of excellence performance. Obviously, this double consideration hinders the measurement of this dimension. Analysing university research budgets, we can say that research funding is mainly project-based. This is crucial when examining the university's degree of autonomy as an institution to allocate and mobilize resources and when interpreting the structure of the budget.

The ICU Report has three different parts which in one way or another depict the logical movement from internal strategy (design of the institution's vision and goals) and management to a system of indicators for disclosure (OEU, 2006): (a) Vision of the

Institution, (b) Summary of intangible resources and activities, and (c) A system of indicators (see figure 6.4).

According to other experiences and guidelines analysed (see chapters 2 and 5), the first two stages focus on coherently relating the strategy of an institution to the IC Report. The ICU Report presents the battery of indicators selected (taken from the indicators the Strategic Matrix), and some insights into how to disclose IC information in 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.

Figure 6.4. Scheme of ICR Process



Source: The Author

6.2.2. Critical Review of the Project: Methodological Shortcomings and Difficulties

Regarding the ambitious goals of the Project and taking into consideration the complexity of HE sectors across Europe, a case-study approach was used within the Project to define the thematic and transversal dimensions and to build the indicators in each participant university. By developing the Strategic Matrix and the ICU Report, some methodological shortcomings have emerged. Accordingly, in this sub-section we critically review the objectives achieved by this European initiative and highlight the most important drawbacks.

In our opinion, the main shortcoming of the Observatory is that it was able neither to test the analytical framework in all the participant universities nor to assess the validity and usefulness of the methodological guide.

From a general perspective, the **high degree of specificity** of each university illustrates the enormous difficulty in providing a homogeneous analytical framework which is both useful and significant in the whole European HE context. Indeed, it can be said that there is no European HE sector itself despite the on-going endeavours to create the EHE Area. Accordingly, a university's internal structures and governing modes rely on national, or even regional, conditions which make it extremely complex to analyse research activity comprehensively.

When talking about universities, one of the first concerns that has emerged is how to define the **boundaries of the institution**. Quite often, universities have research units located on campus and in hospitals, technological parks and hybrid centres associated with the institution. For this reason, the definition of the perimeter of the university is one of the starting points that should be addressed in order to account for and manage research activities in universities.

Another important issue that the Observatory has tackled is the **level of data desegregation/aggregation**. How much desegregation is useful for benchmarking analysis, how much is possible and cost-efficient? Is it feasible to break down data regarding an institution, faculties, departments, research groups, at an individual level? Although some indicators in the Strategic Matrix refer to the institutional level, faculties have been taken as minimum unit of analysis. Breaking down indicators regarding

research groups, labs or research centers has been considered extremely difficult (if at all possible), extremely costly and worthless for comparative analysis. Indeed, this information is unavailable in most universities.

However, the great differences in scientific fields concerning expected outputs (mainly patents and publications) means that great care should be taken when comparing aggregated figures regarding productivity. Although there is a clear need to provide desegregated data for certain indicators, there is no consensus on the number of scientific fields that the OEU group should use for breaking down indicators. Because of this, we have attempted to provide an initial approach to categorise the great number of disciplines in six large scientific fields, following the recommendations of the Frascati Manual (OECD, 2002b): natural sciences, engineering and technology, medical sciences, agricultural sciences[100], social sciences and humanities (see table 6.5). We have undertaken an initial comparison of nine European universities[101] in order to unravel the heterogeneity that exists in these scientific fields and the availability of disaggregated information, assuming, as mentioned before, faculties as minimum unit of analysis (Castrillo, 2006; Sánchez, Elena & Castrillo, 2006a, b and c). We are obviously aware of the reduced number of universities considered, but feel it is an interesting starting point.

At first sight, the comparison was not considered very difficult. Nevertheless, unless the Frascati fields are thoroughly broken down, it can lead to confusion. Titles of each scientific field are not enough to assure the right inclusion in one or other field.

Table 6.4. Scientific Fields Disclosure

	Université Marne-la-Vallée	Université Lausanne	UAM	Universidade de Aveiro	Université Paris-Sud	Maastricht University	Bologne University	Ecole Polytechnique Fédérale de Lausanne	University of Venice
Natural Sciences	X	X	X	X	X	X	X	X	X
Engineering & Technology	X		X	X			X	X	
Medical sciences		X	X	X	X	X	X		
Agricultural sciences							X		
Social sciences		X	X	X	X	X	X		X
Humanities		X	X	X		X	X		X

Source: Sánchez, Elena & Castrillo (2006)

[100] It is important to note that the Spanish Government does not separate the field of Agricultural Sciences (and it considers only five fields) and this can pose a problem when universities have to decide how to report their information. Homogenisation in the way information is grouped is needed.
[101] Part of the OEU project from France, Switzerland, Spain, Italy, Portugal and Netherlands.

Table 6.5. Fields of Science and Technology

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

Source: Frascati Manual (OECD, 2002b; p. 67)

Another difficulty when building the indicators selected was that most of the needed **data were scattered throughout the university** in different departments, institutes, administrative offices, etc. The process of gathering information may vary significantly from one to another. As a result, on the one hand, comparability between areas and issues is not always possible, and, on the other, managers have only a partial notion of the university's activities. In order to solve this problem, some universities, as is the case of UAM and other universities in Spain, are starting to integrate all the databases in a common data warehouse, which will include economic data, human resources, teaching activities, research results, information about all students, etc. One of the main recommendations of the OEU project is to encourage the construction and development of integrated databases to facilitate internal management and comparison with other institutions in the future. This is one of the main reasons that few universities have been capable of providing the necessary data to build all the indicators included in the matrix.

Furthermore, we considered that a **further and better definition of concepts and indicators** is required in order to achieve real comparability. Indeed, as we will explain in next chapter, when developing the case studies, some interviewees stated that indicators were confusing and open to different interpretations.

Although the strategic framework was built as a tool to improve internal management of research in universities across Europe, the battery of indicators selected could be a good base for benchmarking analysis. However, there is a risk of using the matrix only as a set of meaningless indicators without **descriptive elements or narrative** to contextualize the university's profile. It is important to note that the proposed framework and its indicators were not conceived to create another ranking of universities.

Obviously, this comparability exercise assumes the potential **diffusion of the indicators**. Although the figures captured in the strategic matrix were not considered, in principle, as confidential some universities have shown reticence or scepticism about the benefits that can be obtained from divulging this information. On the same lines, some university managers are specifically concerned about the misleading way in which data could be presented.

Last but not least, one of the main drawbacks of the Project has been the **lack of activity-related indicators**. According to the classification that was defined by the MERITUM project (2002) we can distinguish between intangible resources and activities. From the static point of view, intangible resources are defined as 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). From the dynamic point of view, intangible activities refer to the 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 two former activities. These are crucial in order to understand the institution, not today but in the medium-long term. They give revealing insights into the expected evolution of the organisation's IC linked with its strategic objectives. In the particular case of HE institutions, we can study, for instance the mechanisms to encourage researchers to produce academic outputs. This concrete activity reveals university research strategy and provides some hints about its future prospects.

Neither the Strategic Matrix nor the ICU Report includes activity-related indicators. As argued by Sanchez, Elena & Castrillo (2006), the main reason for this is that the OEU project has built indicators mainly in accordance with the ease of data collection: indeed, the feasibility of obtaining information in Universities was a major criterion when selecting indicators. Furthermore, this limitation is also related to one of the main goals of this exercise: creating a list of indicators that looks for comparability among institutions. For benchmarking analysis it may advisable to use resource indicators. Finally, it is only these resource indicators have been selected bearing in mind the possible reluctance of university administrators 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. It is for these reasons that indicators on activities to be disclosed should be selected more carefully.

Nonetheless, we do consider that building indicators that provide information on activities is paramount in future steps in ICU Report development.

Regarding the particular methodological problems or limitations that each thematic dimension has encountered, we wish to highlight the following:

- **Funding**:

An issue related to funding, whose analysis we have considered particularly relevant and which was not solved by the OEU, is the **range of salaries and scholarships**, covering the different levels within a university and across universities. In order to allow reasonable comparisons, our suggestion is to develop a shared measuring system and we recommend the creation of an index for the range of salaries in each institution based on salaries in real terms (using, for instance, the European deflator provided by Eurostat).

Table 6.6. Cost of living in EU countries

Cost of life in European Union countries (Belgium = 100)		
	2002	**2003**
Germany	112.8	113.9
Spain	84.0	85.0
France	103.7	105.7
Netherlands	105.1	106.7
Hungary	50.2	52.1
Italy	98.9	102.7
Portugal	77.0	79.8
Switzerland	150.8	146.6

Source: Eurostat

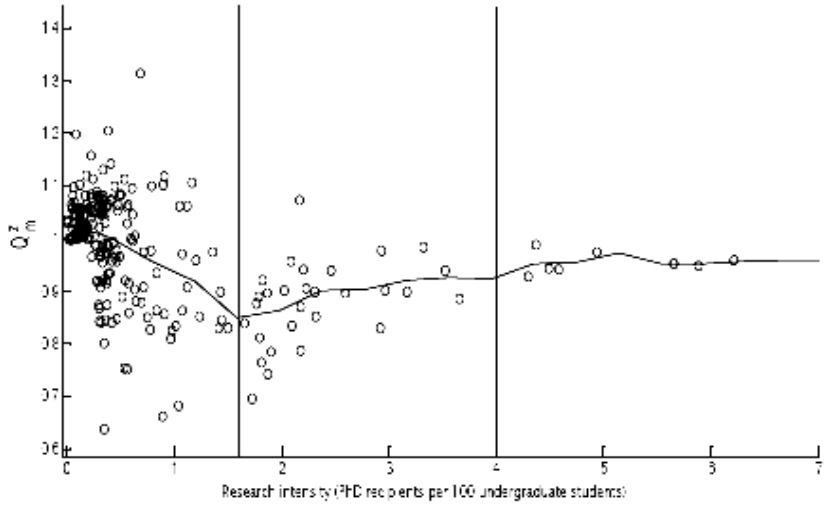
The index could be constructed on the following basis: 3.000 deflated Euros equal 100 (see table 6.6 as an example).

- **Human Resources**: Another issue that was revealed as controversial and notably relevant is the duality or trade-off research/teaching. In most European universities, teachers are researchers at the same time, and it is his/her individual responsibility to distribute time between both activities[102]. Although most scholars consider teaching and research complementary activities that create synergies, it is evident that if both activities are undertaken by the same staff using the same facilities there is a trade-off that universities should consider and manage correctly. Aware of this problematic situation, the Aquameth project has tried to analyse this issue from a micro-level point of view (see figure below).

However, the micro-data analysis is not enough since, as the graph illustrates, not every university maintains the same trade-off. For this reason, we affirm that it is important for university managers to understand how both activities are interconnected in their institution and manage this dichotomy according to the organisation's strategic objectives.

[102] In addition some studies are looking into the distribution of time spent on: research, teaching, and their mission (also called `extension´). For further analysis of faculty time spent on these three activities using a specific tool: Data Envelopment Analysis (DEA), see: Tauer et al. (2006).

Figure 6.5. Trade-off Teaching vs Research Intensity



Source: Bonacorsi & Daraio (2007)

Furthermore, even when universities declare that research is crucial for the production of knowledge and for the institution's prestige and reputation, our analysis of university daily life shows that, in most of them, recruitment processes are mainly focused on teaching necessities rather than attracting researchers for a particular field of knowledge. This situation creates considerable internal tension between both activities that is very difficult to deal with given the current academic structures. Regarding this dilemma, the Observatory has come to an internal agreement which includes the term `researcher´ in both the Strategic Matrix and the battery of indicators, although it covers both teacher/researcher. Although this shared definition allows comparability, we feel that it is important to differentiate between teaching and research and the time devoted to each. How to account for the distribution of this time is a very difficult task, however, if universities want to improve the management of their research activities and establish priorities, it is crucial to know who their researchers are and how much time and resources are dedicated to doing research. Moreover, as stated by the OEU (2006), the transversal nature of human resources implies that this dimension is especially delicate. For instance, the analysis of the ratio students per teacher where the differences among disciplines is very significant (empirical evidence from case studies shows that, in general terms, teachers of experimental sciences have less students that social science teachers), should be taken into account when assessing academic results and defining internal policies. Further research is needed in this

particular area. Accordingly, we consider it would be more advisable to follow the Fracati Manual´s (OECD, 2002b) recommendation in all European universities to account for researchers.

- Regarding the third dimension, **academic outputs**, we consider that the work done by the OEU relies once again on the traditional scientific indicators (publications, citations, impact factor, etc.). Further efforts to design alternative qualitative measurements to assess books, chapters of books, or non-written academic outputs are required.

- One of the most controversial areas to analyse is probably the so-called **third mission**, which has many elements in common with the concept of `relational capital´ in the IC framework. The international heterogeneity stemming from the various ways to interact with society and to assess performance makes the construction of quantitative indicators very complicated. Narrative and qualitative arguments are therefore needed and comparisons are then much less accurate. Moreover, many academics consider the activities listed under “third mission” are too broad, and not strictly relating to research but to society in general. To overcome this drawback the Observatory has defined detailed questions with YES/NO answers and checklists of the different functions a given university may perform. Regardless of this, we are aware that benchmarking analysis in this dimension is truly complicated and should be qualitative in nature. However, it should be noted that there is general consensus on the importance of the third stream as a university mission. We, therefore, consider that by recording them universities are making a commitment to society to manage them.

In addition, it is important to note that the indicators proposed within this thematic topic try to capture both a social and economic dimension. In this way, the indicators related to economic issues (such as intellectual property, spin-offs, or contracts with industry) are more accurate, while the social ones are only in the very early stages.

- Finally, concerning the dimension of **governance**, note that it was added to the Strategic Matrix later than the others, when the working group realised that this aspect was crucial to contextualise and understand the rest of dimensions. By including this dimension, the main goal was to analyse the autonomy and capacity of universities to manage their resources. The main methodological difference to the other dimensions is

that this has used not only exiting data but has also had to create new data. The approach has been necessarily qualitative and has followed the four following steps (OEU, 2006; p.174-175): (1) making existing data relevant and analysing them (2) moving from available data to manageable data, (3) analysing the instruments used by universities and (4) characterising styles of governance.

Given the complexity of this dimension and the novelty of its conceptualisation, one of the main constraints in developing a conceptual and analytical framework has been that only two proactive universities have participated: the Autonomous University of Madrid and University of Lausanne. Consequently, the OEU was not able to produce an accurate categorisation given the lack of data and empirical evidence. As mentioned in the final meeting for the project held in Lugano (November, 2006), this dimension is exploratory in nature and more qualitative fieldwork is required.

Summing up, the critical analysis of the strengths and weakness of the work done by the Observatory has provided us with a robust basis for the development of the empirical part of this PhD Thesis. Particularly, our fieldwork has focused on the fifth thematic dimension: Governance, since it has been the most difficult issue to analyse and was explicitly singled out by the OEU for further research.

6.3. Final Remarks: Complementary or Overlapping Projects?

The two experiences analysed in this chapter have been developed simultaneously and within the same Network of Excellence. By carrying out these initiatives, the European Union is explicitly showing political interest in HE institutions, and particularly, in the importance of strategic management in universities. Although both projects have focused their efforts on the same unit of analysis: European universities, the objectives and approaches have been different, and, in our opinion, complementary.

While the Aquameth Project has followed a top-down approach using secondary sources of information and working on micro-data at university level, the OEU´s approach has been clearly bottom-up, using not only secondary sources of information, but collecting data through interviews.

Analysing data from a micro perspective could be useful to position universities in the European context. Accordingly, the Aquameth technique clustering and mapping universities could be relevant when analysing the position of each university and finding out if the divergences among them are related to individual characteristics or to national patterns. In this case, the results of the project could be useful for policy makers at national and European level. However, the Strategic Matrix and the ICU Report developed in the Observatory are tools designed for universities to improve their internal management and transparency level, respectively.

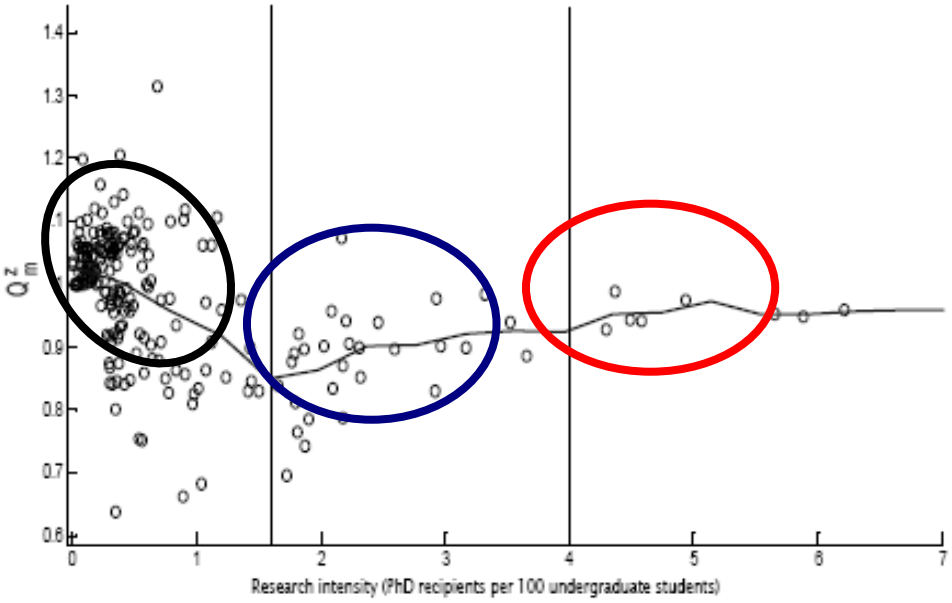
Accordingly, we consider that the above-mentioned idea of creating bi-dimensional maps to position universities developed by Aquameth is very similar to the concept of `*strategic groups´* used in the business literature (Grant, 1996; Gery & Kevan, 2000). This latter concept has been used traditionally to analyse competitiveness intensity among firms in a given industry and is defined as the groups of firms working in the same sector or market that follow the same or similar strategies. It is related to the internal characteristics of the corporations and not with the aspects that define the industry. Accordingly, firms use this technique to gauge their positions in relation to the main competitors regarding two dimensions that are core to their internal strategy. By doing this, the organisation can identify which other entities work following similar strategies, and thus, re-define their internal objectives in order to compete better.

Similarly to the business-logic, with the information provided through the maps, university managers will be able to make strategic decisions and formulate action plans according to their real position in the HE sector. As the Observatory has illustrated, each university has different characteristics, and, for this reason, should not be expected to follow the same pattern or trend. Indeed, we believe that universities should find their own position in the sector and shape their activities according to their critical resources and strategic objectives in keeping with their internal capacities and the context in which they are working. General policies for universities are not the solution since each university has especial features. If a particular university is in a specific strategic group, it will be better able to decide its strategies since its main "competitors" can be identified (although not necessarily located in the same area nor in the same national context). In addition, university administrators and policy-makers will realize that not all HE institutions should follow the strategies nor define the same goals as particularly successful examples, such as Cambridge University, but to define

their own strategies, priorities and internal policies more in accordance with their own position and their future trends.

Following on with the same example used before (teaching versus research intensity), we can define three different groups, or strategic groups, where a number of universities are located. Knowing the names of the universities included in each group (the Aquameth project can identify each participant university on this map) and the policies and actions developed by these universities, managers can put into action new policies and set different objectives in order to better compete or re-define their practices in order to move from one position to another.

Figure 6.6. University Strategic Groups taking into account Teaching and Research Intensity



Source: Adapted from Bonacorsi & Daraio (2007)

In conclusion, we consider that both projects complement each other. On one hand, aggregated data may be useful for positioning universities, but they throw little light on the way institutions work, what their characteristics and internal objectives are, what kind of constraints limit their actions, etc. On the other hand, the Strategic Matrix and the ICU Report have been designed to enable university administrators to improve the internal management and transparency of their organisation.

However, the governing mode or process through which universities transform their input into output still needs further attention. More systematic effort is required in order to better understand how these institutions behave. Accordingly, the next chapters are devoted to analysing four different case studies in European universities with the aim of providing some insights into this topic.

PART III

DEVELOPING STRATEGIC MANAGEMENT IN COMPEMPORARY UNIVERSITIES: LEARNING FROM THE EUROPEAN EXPERIENCE

"One can say of qualitative inquiry what Marcel Proust said of Art `Thanks to this, instead of seeing one world, our own, we see it multiplied…, so many worlds are at our disposal´"
(From Halcolm´s Historical Biographies, cited in Patton,1990; p.36)

7. RESEARCH METHODOLOGY: COMBINING GROUNDED THEORY APPROACH AND MULTIPLE CASE STUDIES[103]

7.1. Why Qualitative Methodology?

Beyond the old debate quantitative versus qualitative research, the existing literature about research strategies or methodologies does not consider either method superior to the other. On the contrary, both approaches are considered as complementary for most of issues under study. As argued by Silverman (2005), neither method of analysis is intrinsically better than the other, but only more appropriate when analysing a concrete research problem. Indeed, each method has its strengths and weaknesses, and researchers have the responsibility of choosing the one best suited to the topic under study.

In this chapter we, therefore, present some ideas about what qualitative research is and our principal reasons for having chosen this approach to examine our topic. Given its nature and novelty, we consider that our research questions, how other researchers have dealt with the same kind of issue, the results that we have found through this research enquiry, and even our personal commitment to this particular research model are better suited to the qualitative approach which enables us to fulfil our aims and learn more about the topic.

[103] I am grateful to Professor Cristóbal Torres from the Autonomous University of Madrid for his helpful comments.

In general terms, we can say that quantitative or positivist approaches are those that use statistical or econometric methods of analysis and claim to be objective, neutral and impartial. On the other hand, qualitative research is defined as those methods, techniques or approaches used in data gathering and analysis that are not based on numerical data (Cassell et al., 2006). Nevertheless, the concept `qualitative research´ is very broad, sometimes ambiguous, and many methods can be grouped under this heading: case studies, participative enquiry, interviewing, participant observation, visual methods, and interpretative analysis (Denzin & Lincoln, 2000; p.2).

Furthermore, while qualitative researchers seek the answer to questions that "stress how social experience is created and given meaning", quantitative studies emphasize "the measurement and analysis of casual relationships between variables, not processes" (ibid., 2000; p.8). It is, therefore, not worth discussing whether one is superior to the other since they are two different analytical perspectives on addressing an issue. Nevertheless, it is argued that qualitative approaches are considered more able to address the high degree of complexity that characterises reality and capture the contextual implications of any phenomenon than statistical tools (Gummenson, 2006; Worley & Doolen, 2006).

The following table presents the most relevant characteristics that define and differentiate both approaches:

Table 7.1. Qualitative Vs Quantitative Research

	Qualitative Research	**Quantitative Research**
Purpose	Understanding and explaining human behaviour from the point of view of the subject through the collection of narrative data	Explaining and predicting (or controlling) phenomenon through the collection of numerical data
Design & Method	Flexible. Assuming a dynamic reality. Oriented towards the process. For instance, ethnography, case studies	Rigid, inflexible, process developed in detail. Assuming a steady reality. Oriented towards the results
Data Collection	Documents, participant observation, informal and non-structured interviews.	No participant observation, test, questionnaires, formal and very structured interviews.
Data Interpretation	Subjective, tentative conclusions, continuous review of the results.	Objective, generalization
Trend	Increasingly use of both strategies in the same research.	

Source: The Author, adapted from Gray (1991; p.214-215)

The origins of **qualitative research** can be traced to the 20s and 30s in both sociology – mainly represented by the Chicago School - and anthropology disciplines. However, qualitative methods have been employed for a long time not only in those fields but in other disciplines such as education, nursing, medical, history, political sciences, social work, communications, and, business and management (Denzin & Lincoln, 2000; Casell et al., 2006). Even some experimental sciences, such as the so-called modern natural science, are now more concerned with "…the qualitative features… rather than the precise values of its variables at a particular time…The new mathematics…represents a shift from quantity to quality" (Capra, 1997; p.134)[104].

During the last two decades, qualitative approaches in social sciences have increased and numerous scholars have published a set of titles on qualitative techniques, strategies, criteria, etc. (Burgess, 1988; Tesch, 1990; Wolcott, 1994; Strauss & Corbin, 1994 & 1997; Miles & Huberman, 1994; Yin, 1994; Locke, 2001; Silverman, 2005)[105].

When analysing qualitative research from an historical perspective it is possible to distinguish seven crucial moments (Denzin & Lincoln, 1994 and 2003a; Locke, 2001)[106]: the traditional (1900-50), the modernist or golden age (1950-70), the moment of blurred genres (1970-86), the crisis of representation (1986-1990), and the crisis of representation (1986-1990), the post-modern (1990-1995), the post-experimental inquiry (1995-2000) and the present moment (2000- …). Each of these moments is characterised by different perspectives of knowledge, different roles of researchers and different languages. However, as Locke points out "(…) the view of research practice expressed in each of them persists and still operates into the present. The result is that qualitative research today is a practice domain populated by many viewpoints and styles of practice" (Locke, 2001; p.3).

Interestingly, when focusing on **management, organization studies and political science** the specialised literature argues that qualitative research has contributed significantly to a wide range of management areas, from the so-called "softer" fields such as organisational behaviour, organisational change or entrepreneurship to traditionally more quantitative fields such as finance and accounting (Cassell et al.,

[104] In Gummenson (2006; p. 171).
[105] To see a broader literature review see Trinidad et al. (2006)
[106] For detailed analysis of each moment see: Denzin and Lincoln (2003a; pp.19-29); Denzin and Lincoln (1994; pp.7-9) and Locke (2001; pp.1-20).

2006). Following on from this, it is argued that qualitative techniques have a great potential to contribute to management and governance research since they provide rich information about organisation behaviour not only to researchers but to practitioners as well[107]. For instance, when exploring the causes of the disconnection between research results and management practices, Denyer & Tranfield (2006) explain that this gap could be overcome adopting qualitative research techniques which give managers and practitioners useful insights into specific cases that are specially effective or successful. In this way, the term `good practices´, widespread in this field, reflects the importance of this argument. Furthermore, qualitative research approaches are being increasingly valued for "the purposes of informing policy and practice" (Denyer & Tranfield, 2006; p.218).

In particular, qualitative research for management has been increasing during the last decade. Such an interest is reflected in the recent creation of international journals to cover the qualitative perspective in management fields, such as *Accounting, Organisations and Society*; *Accounting, Auditing & Accountability Journal; Qualitative Research in Accounting and Management,* or the new journal launched in May 2006 *Qualitative Research in Organisations and Management: an International Journal* (Casell et al., 2006). Along the same lines, a special issue of the international journal *Management Decision* entitled "Qualitative Methods in Management Research" was launched last year. Its purpose was to highlight the significant contribution of qualitative research to different fields of management: among others, managerial work, organizational control systems, employee relations, small and medium enterprises, or accounting (ibid., 2006).

Despite the arguments for supporting qualitative research strategies in social sciences, at the moment, quantitative approaches seem to be main stream (Gummesson, 2006), and are highly appreciated in most international and prestigious journals (Cassell et al., 2006). Thus, it is common to find disciplinary and academic resistance to qualitative studies, considering them in pejorative terms, "unscientific", "soft", "only exploratory" or "subjective" (Denzin & Lincoln, 2000; p.7). In response to that, other authors argue that this resistance "illustrates the politics embedded in this field of disclosure" (Denzin & Lincoln, 2003a; p.11), and, as Patton argued, this controversy was originated in the

[107] See Cassell et al. (2006) in their article "The role and status of qualitative methods in management research: an empirical account" in Cassell et al. (Eds) (2006) for more detailed analysis and references.

debate in science over "how best to study and understand the world" (ibid., 1990; p.477).

Indeed, some scholars consider the use of quantitative research methods problematic. In general terms, the main concerns about this methodology are (a) the lack of objectivity and neutrality, and (b) difficulties in generalising.

Considering the important role that the researcher plays in qualitative enquiry, this methodology is considered to **lack objectivity**, meaning that there is bias and is, thus, unreliable (Patton, 1990).

In accordance to this idea, positive or experimental sciences - such as physics, chemistry or even **economics** -, are seen as able to understand reality transcending opinions and personal bias (Denzin & Lincon, 1994 and 2003a). They are conceived as "value-free objectivist science" (Carey, 1989; p.4)[108].

Focusing on our field, traditionally economists considered it possible to give an "objective" account or perspective of a certain problem or issue, eliminating most of the errors, in order to obtain unbiased results. As stated by John Stuart Mill at the end of the 19th century: "neutrality is necessary in order to promote autonomy" (Mill, 1964). However, it is important to note that the literature differentiates between positivist and normative economics (Lipsey & Chrystal, 1995; Begg et al., 2003). On one hand, positive economics provides objective or scientific explanations of how the economy works. Thus, its aim is to analyse problems related to consumption, production or exchange of goods and services. It tries both to explain why the economy works as it does and to allow predictions about how the economy will respond to future changes. In this regard, it is said that positive economics is similar to the natural science such as physics, geology or astronomy. Mainstream approaches claim that economy is positive and, thus, positivist techniques of analysis should be used to prevent biased interpretations. Following this line of thought, there is no scope for personal value judgements. On the other hand, normative economics offers recommendations based on personal value judgements. Normative statements concern what ought to be; so they are inextricably bound up with our philosophical, culture and religious positions (Lipsey & Chystal, 1995; Begg et al., 2003).

[108] Cited in Denzin and Lincoln (2003a; p.211).

In our opinion, the idea of "objective research" should be, at least, discussed. Researchers (qualitative or quantitative) are persons, with cultural values, ideologies, social class, political concerns, gender, background, economic context, etc. that depict their personality and priorities. Undeniably, research work is affected by these considerations, for instance, when deciding on the topic, the hypothesis, the research questions, the variables of the research, or the research strategy. Even quantitative research methods are not protected against bias. Our concern is that topics related to political economy, science policy or organisational studies are normative by nature since priorities and personal assessments obviously affect problem analysis. For this reason, we do not claim neutrality or impartiality in our research.

Accordingly, qualitative research does not seek to be `objective´ in the way explained before, but to be able to incorporate the contextual aspects that shape the research questions.

Another concern commonly reflected in the specialised literature is that it is not possible to get statistically significant results from qualitative research, so there are **difficulties in generalising** and extrapolating conclusions to other contexts. As pointed out by Patton, in most cases, the small sample analysed makes it impossible or really difficult to generalise (Patton, 1990; p.486). However, qualitative researchers often work with relatively small samples or cases, sacrificing scope, to some extent, for the benefit of detail (Silverman, 2000). In this sense, it is important to note that it is not our aim to make generalisations from the statistical point of view but to better understand a reality and explain it.

In summary, as the specialized literature recommends we have chosen the research approach that we considered the most consistent with our research enquiry and with what we have tried to find out. Thus, qualitative methodology seems to be the most suitable for this PhD research for the following reasons:

- Our main aim is to **understand the phenomenon** in detail, the key aspects and elements as well as the relations among them.

- The main topic - IC tools and managerial decisions in public universities- is **highly complex and contextual**.

- The **novelty of the research topic**. The fact that the two most important and specialised international reviews - note that the first issue of *Journal of Knowledge Management* appeared in 1997 and the first issue of *Journal of Intellectual Capital* was published in 2002 - are so recent, is simultaneously proof of the novelty of the topic and the international academic community's great interest in it.

- Finally, the **approach chosen by other scholars** to analyse intangibles and IC management in different sectors and contexts tends to be qualitative. Since, as posed in the previous point, the research field is quite young, few studies have discussed the methodological approach in studying IC models (Kujansivo, 2006). In order to provide some insight into it, Kujansivo (2006) has explored approximately 600 articles[109] published in the two major international reviews on this aforementioned field– *Journal of Intellectual Capital* and *Journal of Knowledge Management*-, using the systematic review method[110].

The figures reveal that roughly 50% of the articles were theoretical (conceptual papers, literature reviews, description of frameworks, etc.) and around two thirds of the empirical studies were using case study analysis (see table below). These data emphasize two main points: (a) the novelty of the field and hence the necessity to develop the theoretical framework further, and (b) that when doing empirical work, the approach chosen by the academics was mainly qualitative, especially for case studies.

Table 7.2. Approaches Applied in Previous Studies on IC Management

	Theoretical Studies	Case Studies	Statistical Studies	Total
Studies on Controlling IC	101 (46%)	67 (32%)	47 (22%)	215 (100%)
Studies on Developing IC	191 (52%)	119 (33%)	56 (15%)	366 (100%)
All Articles	292	186	103	581

Source: Kujansivo (2006; p.8)

[109] Particularly, 215 studies on IC controlling and 366 on developing IC were analysed. To see the difference of these two IC management functions, see Kujansivo (2006; p.3).
[110] Time period studied: 1997-2006.

Nevertheless, we are aware of the drawbacks and aforementioned criticisms and our main concern has been to provide rigour and credibility to both the research process and the results. Accordingly, our efforts have been focused on assuring the quality of the observations or cases (as recommended by Patton, 1990) by (a) following a systematic data gathering and analysis process, and (b) triangulating data using a multi-method approach. The rigorous method for the data collection and analysis was the constant comparative model proposed in the grounded theory by Glaser & Strauss (1967). As stated by Glaser (2004; p.4), "*Grounded Theory is a straightforward methodology. It is comprehensive, integrated and highly structured*". In addition, the replicate logic for the analysis of multiple case studies has been applied.

The next sections will explain the specific qualitative approach and methods chosen – Grounded Theory (GT) and case study analysis - stressing the importance of following all the steps advised by the experts to develop the fieldwork with the maximum rigour. However, it should be noted that for further research we intend to complement this PhD Thesis with more quantitative information, for instance, using standardised questionnaires and statistical analysis methods.

7.2. Combining the Grounded Theory Approach and Case Studies Analysis

7.2.1. The Inductive Research Logic: Grounded Theory Approach

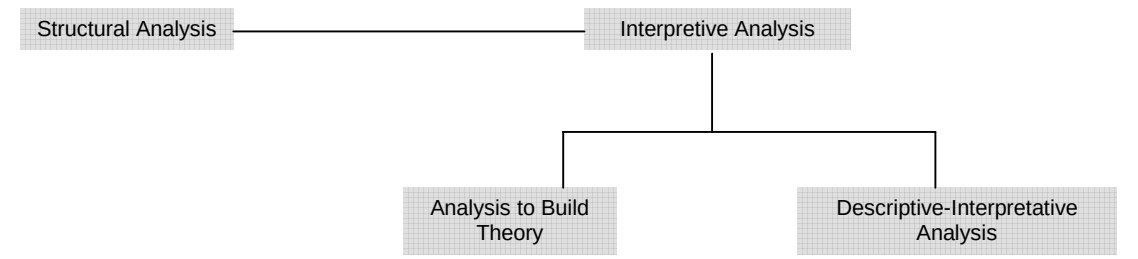
As mentioned before, there is a wide variety of qualitative research strategies and methodologies[111]. Among others, ethnography, action research, grounded theory, case study, discourse and biography analysis, etc. Specifically, this PhD Thesis is based on the combination of the grounded theory logic and the case studies approach[112]. This section explains the Grounded Theory and its suitability for this PhD research. The choice of case study as research strategy will be justified in the next section.

In general terms, and following Tesch´s (1990) review of qualitative research approaches, we can distinguish between structural and interpretative analysis. The first concept includes discourse analysis, ethnography, etno-science, and structural

[111] For further review of research methods, see Denzin & Lincoln (1994) and Rodríguez-Gómez et al. (1999), Chapter 2, pp.39-60.
[112] Both research methodologies and approaches can used as well as with quantitative data, although they are typically associated with qualitative analysis (Denzin & Lincoln, 2003a y b).

analysis of events, while the second is focused on those studies oriented to the identification of categories, characteristics and relations among them with the main objective of generating theoretical frameworks (see figure below).

Figure 7.1. Kind of Qualitative Analysis



Source: Tesch (1990; p.99)

The so-called **Grounded Theory** (GT) can be framed in the interpretative analysis since its main concern is to create theory from empirical evidence. The formal description of this approach was initially published in 1967 by Barney Glaser and Anselm Strauss in their book *The Discovery of Grounded Theory: Strategies for Qualitative Research.* As the authors pointed out, "the discovery of theory from data systematically obtained from social research" (Glaser & Strauss, 1967; p.2) is the central theme of the book.

As mentioned by Mínguez-Vela & Fuentes-Blasco (2004), the scientific activity starts with the accumulation of experiences, and after the analysis of the evidence it is possible to create theory. In other words, the conceptualisation of theories or concepts is the result of the analysis of the evidence. Contrary to the deductive analysis that characterises most quantitative research, this approach is based on an inductive method. As Locke (2001) states "it moves from empirical observation to the definition of concepts" (Locke; 2001; p. 36). The Grounded Theory approach can, therefore, be defined as an inductive research methodology of analysis and data gathering that uses a set of methods systematically applied to generate theory about a substantive area (Glaser, 1992).

This logic for qualitative research, initially used by sociologists, is now used by other social sciences such as business, accounting, management, education, philosophy, nursing, public health, or social work (Strauss and Corbin, 1997; Locke, 2001). Some

scholars even argue that "the grounded theory is the most widely used qualitative interpretive framework in the social sciences today" (Denzin, 1994; p.508).

Despite the considerable impact caused by Glaser & Strauss´ publication (1967), it is important to note that over time both authors have evolved, and even diverged, from the original ideas developed in their first monograph. Divergences began to emerge at the beginning of the 90s with the publication of two titles: *Basics of Qualitative Research: Grounded Theory Procedures and Techniques* by Strauss & Corbin (1998)[113], and *Basics of Grounded Theory Analysis* by Glaser (1992). As highlighted by Trinidad et al. (2006; p.21), from this moment it is possible to distinguish two perspectives: while Glaser's view is more consistent with the initial principles of theory creation and holds that the theory `emerges´ from data, Strauss and Corbin seem to be more focused on the descriptive/interpretive analysis and on the idea of constructivist theory. The difference between both approaches is subtle but relevant (Corbin & Holt, 2005; Charmaz, 2000 and 2003). Glaser´s view implies that the theory is grounded in data and embedded in reality, so the researcher has to "discover" the theory. This perspective relies on the idea that there is only one reality. However, the constructivist perspective suggests that the theory is constructed by the researchers (and even by the participants[114]). By accepting this, the authors are assuming multiple realities and multiple "ways of interpreting a specific set of data" (Corbin & Holt, 2005; p.49). Accordingly, the researcher can use different analytical tools to help the construction of theory[115].

In this Phd Thesis, we have chosen Strauss and Corbin´s GT version because it is closer to our understanding and philosophical approach. Accordingly, we agree with these authors on the fact that there is not only one reality or one truth, and that the theory should be constructed from interpreting data.

One of the most controversial characteristics of the GT is related to the use of the literature. Following GT principles, the researchers must approach the field without predetermined theoretical foundations or a preconceived hypothesis. Indeed, in a recent publication Glaser states that "it is critical in GT methodology to avoid unduly influencing the pre-conceptualisation of the research through extensive reading in the

[113] First Edition 1990.
[114] The Constructivist Ground Theory is considered by Glaser a misnomer. See Glaser (2002).
[115] However, note that Glaser (1992) stated that the use of different analytic tools implies "forcing data".

substantive area (…). To undertake an extensive review of the literature before the emergence of a core category violates the basic premise of GT: that being, the theory emerges from the data not from the extant theory" (Glaser, 2004; p.12). However, it is extremely difficult for researchers not to have any pre-conceived idea when starting the research inquiry. The PhD research process, in particular, involves a review of the relevant literature. Thus, an in-depth review of the accumulated knowledge in the literature has been made for this PhD Thesis. And as Allan (2003) experienced when applying GT to the analysis of computer systems in UK organisations, "this literature review did not lead to any hypotheses of sufficient interest" (Ibid. 2003; p.7). For this reason, we considered this research logic better suited to understanding the phenomenon and contributing to building the theory. Indeed, Glaser & Straus (1967; p.169) encouraged researchers to "use any material bearing in the area", including other authors' papers (cited in Allan, 2003). We agree with the scholars that have applied GT to their investigations and consider that literature review and this research logic can be consistent (Allan, 2003; Hughes & Jones, 2003).

Regarding the analytical process used to arrive at conceptualization, Glaser and Strauss - in their first monograph and in later works – have described a systematic research process for building theory "grounded" in data. They stated that from the analysis of reality it is possible to conceptualize a set of features, define conceptual categories and their main properties, and explain their relationships. In this PhD Thesis we have followed this systematic procedure in order to provide rigour and credibility to the data collection and analysis processes as well as to the results. Two of the most significant features that define the GT logic are: the constant comparative method[116] and the theoretical sampling[117].

The purpose of the comparative analyses is to establish the generality of a fact and to generate theory from multiple observations or incidents by comparing them. It refers to a set of practices systematically applied that "offers a logic for composing conceptual elements that hinges on their articulation through close reading, comparison, and attendant conceptualisation of data" (Locke, 2001; p.45). It comprises four phases or stages: comparing incidents applicable to each category; integrating categories and

[116] See Glaser & Strauss (1967; pp.21-43).
[117] See Glaser & Strauss (1967; pp.45-77).

their properties; delimiting theory; and writing the theory (ibid., 2001). In order to better understand this method we will briefly explain each of these stages.

The first one attempts to assign a common meaning to the multiple data observations or incidents in a conceptual category. By naming and comparing (and memoing[118]) the researcher will be able to define concepts and categories with the aim of conceptualising those elements in an in-process theory. The second stage focuses on defining the generalised relations among the categories and their properties. The third phase attempts to delimit the theory through theoretical saturation. As explained by the authors, when further observations or cases do not produce incremental learning or do not add any new category or information, the process will be completed. Finally, the researcher has to convert all the categories, relations and properties into a more general theoretical framework. After that, the developed theory has to fulfil a set of characteristics to be a `good theory´, mainly two: have pragmatic usefulness and credibility for evaluation (Locke, 2001; p.59). The first characteristic means that the emergent theory "must fit the substantive area to which it will be applied" (Glaser & Strauss, 1967; p.238). In other words, it should be useful not only to academics but to practitioners in their daily life. Accordingly, the framework should be understood by people working in the area. As pointed out by Locke (2001), this feature shows the close relationship between the theoretical framework and the event studied. Secondly, credibility should be achieved through theoretical sampling, comparing groups in order to "extend the general applicability or analytical generalisability of the theory" (Locke, 2001; p.60).

Talking about the term theory is a delicate issue, since there is no general consensus in the literature about the definition of the concept. Thus, the term is defined in different ways by different scholars (Flinders & Mills, 1993; Nagel, 1969; Snow, 1973). Particularly, Goetz & LeCompte (1988) distinguished three levels of theory:

- Grand theories refer to those systems with strong interrelations and abstract concepts that describe, predict or exhaustively explain a large event.
- Formal theories refer to a set of propositions and concepts with softer interrelation that explain a vision of the world.
- Substantive theories refer to a set of interrelated propositions and concepts focused on certain scenarios or events.

[118] Concept introduced by Glaser & Strauss (1967) to the reporting of data gathered from a particular incident.

Glaser & Straus (1967) distinguished between substantive and formal theories, and stated that both can be generated by the constant comparative method. However, researchers must first generate substantive theories that will help to develop further formal theories and reformulate the existing ones. In this way, substantive theory "becomes a strategic link in the formulation and development of formal theories based on data" (ibid., 1967; p.34).

Using the grounded theory perspective, sampling data is a crucial issue during the whole research process, and not only at the initial stage (Locke, 2001). The main concern of theoretical sampling is to search for data with the main aim of gathering the most relevant information on the issue under study that "will best support development of the theoretical framework" (Locke, 2001; p.55). Sampling data is, therefore, completely different from the random sampling used in deductive research approaches and is defined as open-ended and flexible as opposed to lineal. Following this logic, the data gathering and analysis are interconnected and the design of the research is conceived as a spiral where both processes are carried on simultaneously and affect each other improving the whole process (Trinidad et al., 2006). Theoretical sampling will finish when the process reaches the theoretical saturation mentioned before.

The main strength of this methodology is that the researcher is able to identify social problems and their structural and personal context (Corbin & Holt, 2005).
Although, GT has spread to different fields of social sciences and is considered a robust qualitative research strategy, we have found some drawbacks.

As explained before, this qualitative methodology leads to a theoretical formulation and this is based on the participant's interpretations (which are given to the researcher about the event under study) and on the researcher's analysis. It is because of this that GT is accused of being subjective, and thus of lack of rigour. In attempting to resolve the dilemma, the resultant framework should be reported back to the participants for validation (Corbin & Holt, 2005). Aware of this and in order to minimise the risk of bias, in our pilot case (Autonomous University of Madrid) a minimum of two researchers were present at interviews and took notes. One researcher was in change of the transcriptions of the interviews and the other(s) checked the transcriptions, adding

information when necessary. In addition, the final report was sent back to the interviewees to check divergences.

Moreover, the specialised literature does not provide guidelines to replicate the process to generate conceptualisations. To overcome this problem, we have followed not only Glaser and Strauss´ papers and works about how to work with the GT logic, but other authors that have used this research strategy. Among others: Strauss & Corbin (1998)[119]; Nathaniel (2004), and McCallin (2004); and Eisenhardt (1989), Allan (2003), and Hughes & Jones, (2003) for GT and case studies. Accordingly, the following steps have been taken. Throughout the interview we took notes (verbatim if touching on a particularly important issue) and afterwards made the transcriptions. After the first interview, we began the analytical process. Our aim was to examine the content of the interview in order to conceptualise the issues underlying them. We **coded** the information, writing a short explanation of those parts that were considered more important. Using micro-analysis coding (that is, analysing all the interviewee's words and set of words) we assigned codes to the interview text. However, it should be noted that more than one code could emerge from the same text, and, at the same time, different interviews revealed common codes. By doing this, we were attempting to identify key points. When all the interviews were analysed, we put together all this information and created **concepts** that led to **categories** by the constant comparison technique aforementioned. Finally, by linking the categories and understanding the connexions among them we built the **conceptual framework**.

As the reader will appreciate, transcribing, coding, memoing and comparing observations and data are particularly long processes. Indeed, another important concern about GT that specialised literature highlights is that the theory building process is time consuming (Allan, 2003, Hughes & Jones, 2003; Corbin & Holt, 2005). Grounded theory researchers agree that it is very costly in terms of time since the researcher has to be very precise when applying the methodology. By working on a long-term European Project we have had the chance to work with HE institutions for 24 months. In addition, we have concentrated on the key codes identified in the interviews and have compared them in the same case study and across-cases. In this way, we consider we have overcome this problem.

[119] This book presents ten studies whose methodology was GT with comments and suggestions of Strauss and Corbin.

Finally, another common pitfall when using this research strategy, - and that we have considered especially difficult - is when to decide that the code is relevant or significant enough to be a substantive category and, thus, contribute to build the theory. In our research, those codes that appeared at least three times were considered relevant.

Despite the criticisms, GT seems to be appropriate for management and organisational studies. Since most of the theories in those fields are substantive and related to individuals and groups (decision-making, power structures, organizational change, socialization, etc.), (Locke, 2001), we think that GT is specially helpful, well-suited and fruitful for this PhD research. Based of the review of different works on management studies using the logic of grounded theory, and according to Locke (2001; p.95-97), the reasons for selecting this research methodology are the following:

- **Capturing complexity**: this approach is design to capture complex situations and contexts, allowing the researcher to better understand organisations (Martin & Turner, 1986; Orlikowski, 1993).

- **Linking well to practice**: grounded theory has been demonstrated to be particularly helpful to the members of organisations for "gaining perspective on their work situations" (Locke, 2001; p.95). Furthermore, Partington (2000), in his analysis of organizational change, recommends this approach and argues that it is especially relevant within the new paradigm of the Mode 2 of knowledge production. The Mode 2 described by Gibbons et al. (1994), as mentioned in previous chapters, is characterised by trans-disciplinary approaches and attempts to bring together academic and practice domains.

- **Supporting theorising of `new´ substantive areas**: as aforementioned, the main aim of this approach is to generate theoretical frameworks based on "grounded" data. As the author emphasises, in this field different scholars have used this logic to make new areas of interest "emerge" (Harris & Sutton 1986; Sutton, 1987; Eisenhardt, 1989; Eisenhardt & Burgeois, 1988; Yan & Gray, 1994; Brown and Eisenhardt, 1997; Inkpen & Dinur, 1998).

- **Enlivening mature theorizing**: the grounded theory is not only useful to build new theories but also to liven up existing ones with new ideas and perspectives. For example, grounded theory has been applied to research on group behaviour analysis (Gersick, 1988); in leadership studies (Parry, 1998); or the concept of commitment (Singh, 1999). In line with Locke´s (2001) arguments, assuming that the context is rapidly changing, the function of management and the understanding of organisations are also changing which implies that the existing theories are in need of redefinition and reinterpretation.

Lastly, it should be noted that grounded theory has not only been adopted by different scholars in different disciplines but has evolved, adapting and blending with other qualitative techniques (Locke, 1996). One of the research methods that best combines with GT is the case study analysis. The next sections will describe case studies analysis, the reasons that justify its choice for this PhD Thesis, and the compatibility of both qualitative approaches.

7.2.2. Rationale for Using Case Studies as Research Strategy

Case study is a holistic research strategy that can use both the qualitative methods – for instance, participant observation, qualitative content analysis, in–depth interviews, etc. – and quantitative methods – for instance, questionnaires.

In general terms, Yin (1994) defines the term as an empirical enquiry that "investigates a contemporary phenomenon within its real-life context; when the boundaries between the phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" Yin (1994; p.13).

The case study enables one to "fully explore complex relationships between variables" (Worley & Doolen, 2006; p. 231), and allows the researcher to fully understand the specific case and, furthermore, to generalize and theorize about the concrete event under study (Stake, 2000). Studying one or several cases studies is, therefore, considered a research technique to capture knowledge from practitioners, investigate complex and new events and build theories in which the intangible and dynamic elements play a crucial role (Pérez-Aguiar, 1999; Cepeda & Martín, 2005). Accordingly, this research strategy can have different goals: providing a description of the event

under study, testing existing theories, and building or generating new theoretical frameworks (Eisenhardt, 1989; Yin, 1994). As emphasised by the literature, there are two elements that are crucial for case study analysis: the context - since it constrains and shapes the phenomenon under study-, and the need for flexibility.

In addition, many scholars highlight that the results obtained from case study analysis could be a good starting point for further research on the topic using more positivist approaches. In other words, it provides a better understanding of the event under study and helps to build theoretical models which will guide future researches (Pérez-Aguiar, 1999; p.228).

Indeed, the specialised literature stresses that today it is the most common and widely implemented qualitative research method in our disciplines. However, its use is not new. As pointed out by Pérez-Aguiar (1999), Adam Smith (1776) in his analysis of division of labour in the pin industry, Chandler (1962) and Lawrence & Lorsch (1967) all used this technique. Furthermore, Eisenhardt (1989; p.535) shows in her review of the literature different examples of applying this strategy for building inductive theory during the 80s: Burgerman (1983) for management of new ventures; Mintzberg & Mcbugh (1985) for the formulation of strategy in an adhocracy; Harns & Sutton (1986) for parting ceremonies of organizational death; Eisenhardt & Burgeois (1989) for strategic decision-making in high velocity environments; Gersick (1988) for group developments in team projects; Leonard-Barton (1988) for international technology transfer; and Pettgrew (1988) for strategic change and competitiveness.

In this PhD Thesis, and in accordance with the reasons argued for implementing GT logic, the case study method has been chosen for three main reasons. First, because, as mentioned by Yin (1994), case study strategy is preferred when the research questions are `how´ and `why´. These PhD inquiries are, precisely, focused on understanding how the university as an organisation works and why the current governing modes seem unable to govern them using effectiveness and efficiency criteria. Secondly, the specialised literature in the HE sector illustrates that complexity and specificity are two of the main elements that characterise universities. As argued in previous chapters, the changing context in Europe is forcing them to introduce managerial tools. However, as yet few universities are implementing alternative governing and management modes. Indeed, there is little literature related to the

application of IC approaches to universities and research centers. We believe that, based on the European Union recommendations and on the pioneer experiences across Europe, IC models for universities will be a suitable managerial instrument. However, the novelty of the issue, and consequently the lack of quantitative data, hinders the implementation of the statistical and deductive approach. Thus, the case study research method seems well-suited to provide a comprehensive view of the governing models in HE institutions and to analyse the complexity of the relations among agents and elements within these organisations. Lastly, the review of the literature reveals that management of intangibles in public organisations, such as universities, has become increasingly important. However, there is no empirical evidence that proves a positive (or negative) relation between implementing IC models or the improvement in results and performance of the organisation. Since the cause-effect relation is not clearly defined, we consider it is not appropriate to apply quantitative analysis to this research. Inductive methods to first understand the variables or elements that play a major role in this phenomenon are required. In line with Yin (1994), a study strategy is preferred when "examining contemporary events, but only when the relevant behaviour cannot be manipulated" (Yin, 1994; p.7).

There are different case study typologies. Considering Stake's taxonomy, three kinds can be considered (Stake, 2000 and 2003):

- **Intrinsic case study**. It is studied for its particular characteristics by the researcher who is seeking a better understanding of the case itself without further attention to generalisation or comparative analysis with other case studies. Accordingly, the main concern is not to building a theory but to studying the case itself. We can considerer this approach descriptive/interpretive.

- **Instrumental case study**. This category includes those cases undertaken in order to draw a generalisation, to depict a broader conceptualisation of any phenomenon. "It plays a supportive role, and it facilitates our understanding of something else" (Stake, 2000; p.437).

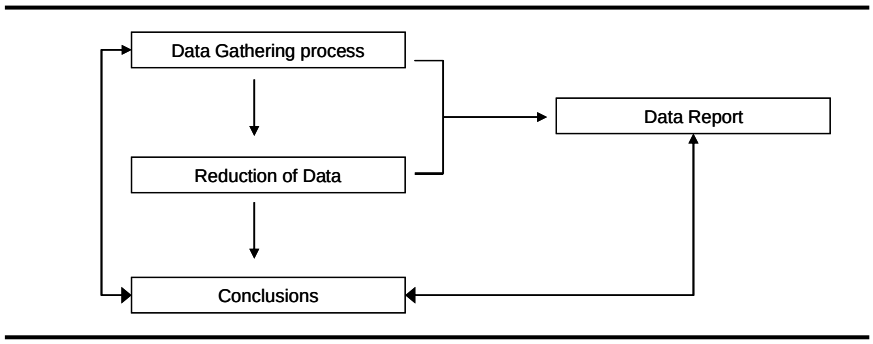
- **Collective cases studies**. This consists of a number of instrumental case studies that are analysed with the aim to better understand a research topic and

to build theory. The individual cases selected can be similar or dissimilar, depending on the researcher's decision.

This PhD research is based on collective cases studies since we consider that this technique has more advantages than a single case for detecting errors and generalising results, and fits better into the grounded theory logic[120]. Furthermore, multiple cases allow replication and therefore are better to build theory (Eisenhardt, 1991). The following sub-section will explain the four case studies chosen: Autonomous University of Madrid (UAM), Pablo de Olavide University (UPO), Lausanne University (UNIL) and Science and Technology Policy Unit (SPRU).

Following the general scheme proposed by Miles & Huberman (1994), each case study should follow an iterative process where the data collected shape the final report and, simultaneously, the conclusions affect the data gathering process. As mentioned before, case study is considered a dynamic method where the data gathering and analysis processes are interconnected and affect each other, improving the final report.

Figure 7.2. General Scheme for Case Studies



Source: Miles & Huberman (1994)

By applying this research method our purpose has been twofold. Firstly, we aimed to provide a comprehensive understanding of each case. In this way, the rich information obtained about each particular situation and context has enabled us to understand each university better. The description of each case, identifying specificities and key elements will be presented in the next chapter. Secondly, we have looked for conceptualisation, moving from specific problems and situations to a more general

[120] Note that some authors argue that single case studies have more advantages than multiple-cases for building theory. For detailed analysis on single case versus multiple cases see Eisenhardt (1991).

understanding of the phenomenon. In our opinion, the main strength of this research strategy is the possibility to build new theoretical frameworks that are "likely to be empirically valid" (Eisenhardt, 1989; p.547).

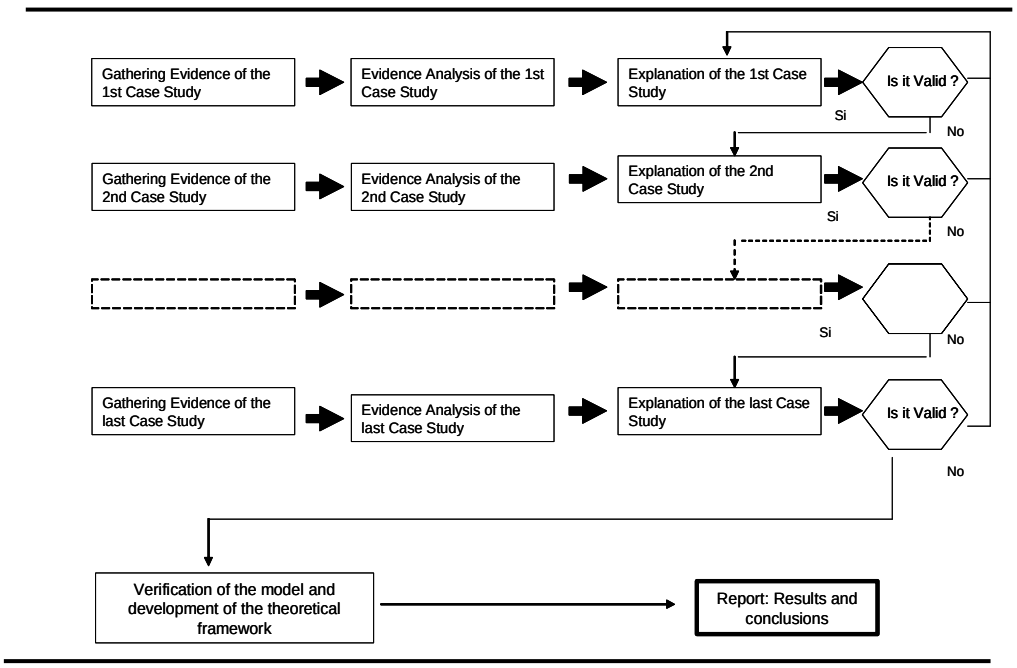
However, like in any other research method, it is possible to identify weaknesses. As pointed out before, qualitative methods are accused of lacking rigour and objectivity, especially when compared with computer-based qualitative analysis such as structural equation models or hierarchical linear models. By using **multiple case studies** under the **replicate logic and multi-method approach** we have tried to overcome this shortcoming and to increase the robustness of the research process and the potential findings.

In the wake of these criticisms, more rigorous perspectives of the case study research method have been developed (Eisenhardt, 1989 and 1991; Yin, 1994; Cepeda & Martin, 2005). It is argued that following systematic procedures and implementing the replicate logic, researchers will be able to provide a more rigorous basis for conceptualization.

When using multiple-case studies, and in order to arrive at generalisation and create conceptual categories, the research process should follow what is called the `**replicate logic**´ (Yin, 1994; Pérez-Aguiar, 1999) as figure 7.3 illustrates. Each case is analysed as a complete study, and the elements, categories, and results found are used as inputs in the next case study, improving the whole process (Pérez-Aguiar, 1999). According to this logic, the technique is considered a learning process itself and clear results can be expected due to the replicate logic. For these reasons, we have applied this logic to our case studies.

Moreover, qualitative researchers are advised to use a multi-method approach as a way of data validation (Eisenhardt, 1989; Fontana & Frey, 2000; Corbin & Holt, 2005).

Figure 7.3. Replicate Logic in Multiple Case Studies



Source: Pérez-Aguilar (1999; p.230)

The term `**triangulation**´ is used to refer to the **process of employing different research techniques or methods** to avoid misinterpretations (Patton, 1990, Stake, 2000). Different sources of data provide richer information and a broader perspective to understand the issue under study and to provide conceptual categories (Glaser & Strauss, 1967; Yin, 1994). The possibility of using different sources of information is the major strength of case study strategy (Yin, 1994). So that, as recommended by the specialised literature (Stark & Torrance, 2005), our fieldwork rely on **interviews, documentary analysis and observation**. The review of the archival data has provided us with rich and detailed information about the history of the institutions, internal policies, budget figures, human resources, strategic aims, etc. Throughout the observation we have collected information on routines, activities, behaviour, etc. Although these observations, as highlighted by Worley & Doolen (2006), let the researcher collect data they are not discussed in the interviews. The fact that we are involved, to a greater or lesser degree, in the institutions under study allows us to understand the complexities associated with the academic environment. The interviews will be explained in detail in section 8.3.

Moreover, triangulation can be developed by **using multiple investigators**. This strategy provides two key advantages: (a) team members enhance creativity and add different perspectives and complementary insights; (b) it enhances confidence in the findings (Eisenhardt, 1989; p.538). Regarding this PhD Thesis, and as pointed out previously, it is important to note that it has been developed under the umbrella of the European Observatory of University Projects and within a research group. From the practical point of view, for instance, interviews for the pilot case were conducted by two or three researchers to complement perspectives and roles within the interviews. This strategy is explicitly recognised by different experts on case study analysis (Eisenhardt, 1989).

Note that the triangulation strategy is also used as a way to combine quantitative and qualitative approaches in order to benefit from the advantages of both methodologies and compensate the potential problems of each approach (Thiertart, et al., 2001; p.82). However, as argued, this PhD Thesis has been developed using only qualitative approaches. For that reason, we have considered especially important to justify the methodological approach accurately.

Lastly, in the pilot case, the report was sent to the interviewees in order to increase the validity of the results. The **participant feedback** is very important to provide validity to the concepts and dimension that are being defined in the process of building theory. As pointed out by Corbin & Holt (2005), by doing this the researcher can modify or change the theory when needed.

Another concern pointed out by the literature is that the resultant theory can be very specific and narrow, and thus, make it extremely difficult to generalize statistically from a small sample of cases (Stark & Torrance, 2005; p. 33). Since the theory is grounded in particular cases it is difficult to reach a high level of generality (Eisenhardt, 1989). As mentioned before, we do not claim that the results from the case study analysis presented in this PhD Thesis are statistically significant. However, Yin (1994) affirms that from case study analysis the researcher can build theories applicable to a broader context than the particular case/s. In agreement with Yin, we consider that the results achieved in this research can be applied to other institutions with similar characteristics and problems.

Finally, selecting the ideal number of cases studies and drawing the boundaries of each case are difficult tasks that involve crucial decisions since "institutions have histories and memories manifested through the understanding and actions of individuals" (Stark and Torrance, 2005; p. 34). It is, therefore, important to pay special attention to the social and historical context of the issue under study. Regarding the number of cases studies selected, see section 8.3.2.

Summing up, despite the mentioned shortcomings we consider that case study as a research strategy best suits our research aims and provides an in-depth understanding of the phenomenon being analysed.

7.2.3. Blending research logics

From the overview of the GT approach we can conclude that it overlaps with most of the qualitative research strategies and methods, but "probably has more in common with case studies" (Locke, 2001; p.18). Reflecting on the use of GT and case studies, Hughes & Jones state that "the use of Grounded Theory in the case studies indicated that it can assist conceptually in the understanding of a problem situation, can discover local empirical theory and can also assist with the articulation of lessons learned" (Hughes & Jones, 2003; p.6).

Indeed, Locke (2001), in her analysis of management studies under the GT umbrella, talks not only about its adoption but about its adaptation over time. She affirms that since the second half of the 70s[121] several researchers have combined the replication logic of sampling for multiple case studies and the GT logic to provide new theories or to extend previous theoretical frameworks. For instance, Pandit´s (1996) analysis of corporate turnaround, Eisenhardt (1989) and Eisenhardt & Burgeois (1988) for decision-making analysis, Inkpen & Dinur´s (1998) research on knowledge management in joint ventures and Poole´s (1998) study of organisational change. Moreover, Eisenhardt's (1989) analysis cited grounded theory logic as one of the central foundations in his proposal of a roadmap for building theory from case study.

From our point of view, the logics that underline case study inquiry and the GT approach are highly compatible and have several aspects in common: (a) both

[121] In the 70s, for instance see Dunn & Swierczek (1977), cited by Locke (2001; p.101).

consider that from the analysis of empirical evidence the researcher can build valid theory. In this way, the final objective of both approaches is to build inductive theory; (b) both models rely on continuous comparison of data. The constant comparative model described by Glaser & Strauss and the replicate logic for multiple cases aim to provide a systematic procedure that assures the rigour of the emergent theory. Therefore, with both logics the research process is highly iterative; (c) they start the research process with the definition of the research questions that are considered crucial to contextualize the investigation; (d) for selecting observations or cases, both propose theoretical sampling and theoretical saturation; and finally, (e) both consider the research process as highly dynamic and flexible. In both methodologies there is constant overlapping between the data collection and the analytical process.

Although, in general terms it is considered that GT data analysis and interpretation can be easily incorporated into case studies (Post & Andrews, 1982; Locke, 2001), we have found some tension between the strategies (Allan, 2003). Yin suggested that case studies benefit from the previous theoretical propositions and frameworks “to guide data collection and analysis" (Yin, 1994; p.13), whereas, as we remarked before, Glaser & Strauss (1967) insisted that the GT approach should have no pre-conceived ideas or hypothesis. However, we believe that the review of the existing literature and the GT approach can be compatible in the case that the review of the accumulated knowledge on the topic does not lead to a firm hypothesis, and the researcher is still open to learning from it and contributing to building new theoretical frameworks.

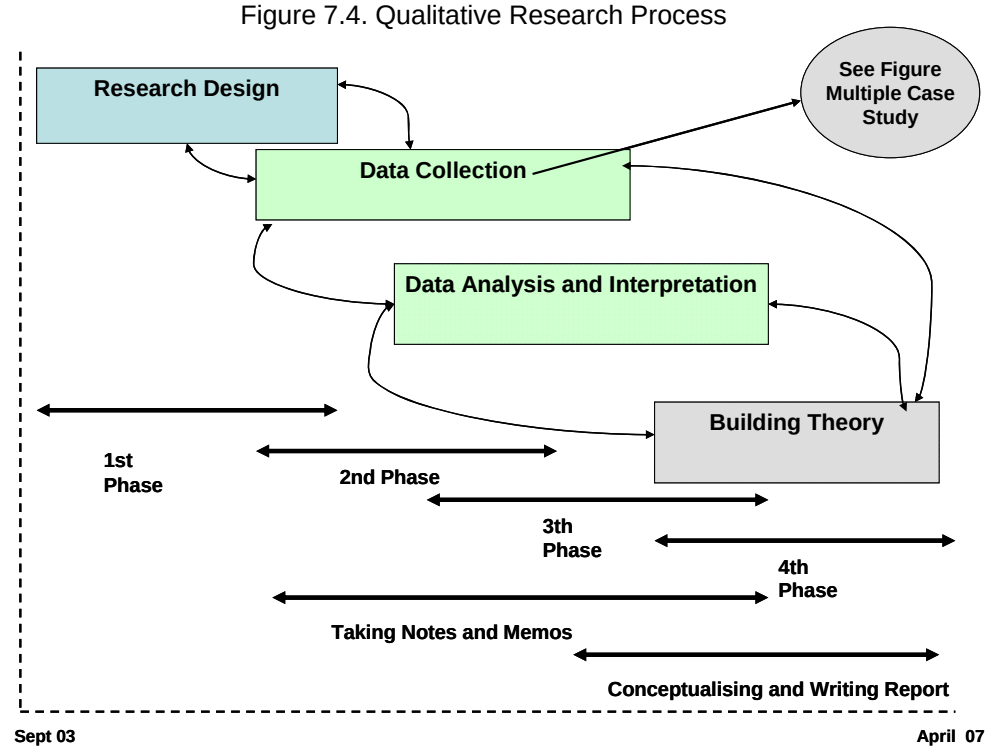
In closing, following an overview of the various qualitative approaches, perspectives and methods to investigate social science issues, the methodological approach chosen for this PhD research has been the use of interpretive and in-depth case studies using the GT logic. The justification for this has been based on the premise that GT provides a set of systematic procedures for coding and analysing data which provide rigour and validity to the research results and are compatible with the deductive approach taken by the case study analysis. By doing this, the PhD Thesis aims not merely to be exploratory, but also to contribute to the generation of substantive theory.

7.3. Research Design

This section illustrates research design as the logic that links the research questions with the data to be collected and the results to be obtained. The methodology chosen shapes the data collection procedure as well as the analysis and interpretation processes.

From the analytical point of view the qualitative research process is organised in four stages: the research project, data collection, data analysis, and report and conclusions (see figure 7.4). However, one of its main strengths is that the development of each phase may not happen in a linear mode but overlap, influence and enrich each other.

Figure 7.4. Qualitative Research Process



Source: The Author

Aware of the strengths of this research technique but also of the drawbacks already mentioned, we have worked following a systematic approach to avoid the risk of being discretionary as much as possible. From the beginning coherent design of the research process was considered crucial, not only for data gathering but to select the case studies. Following the constant comparative model - particularly the replicate logic of

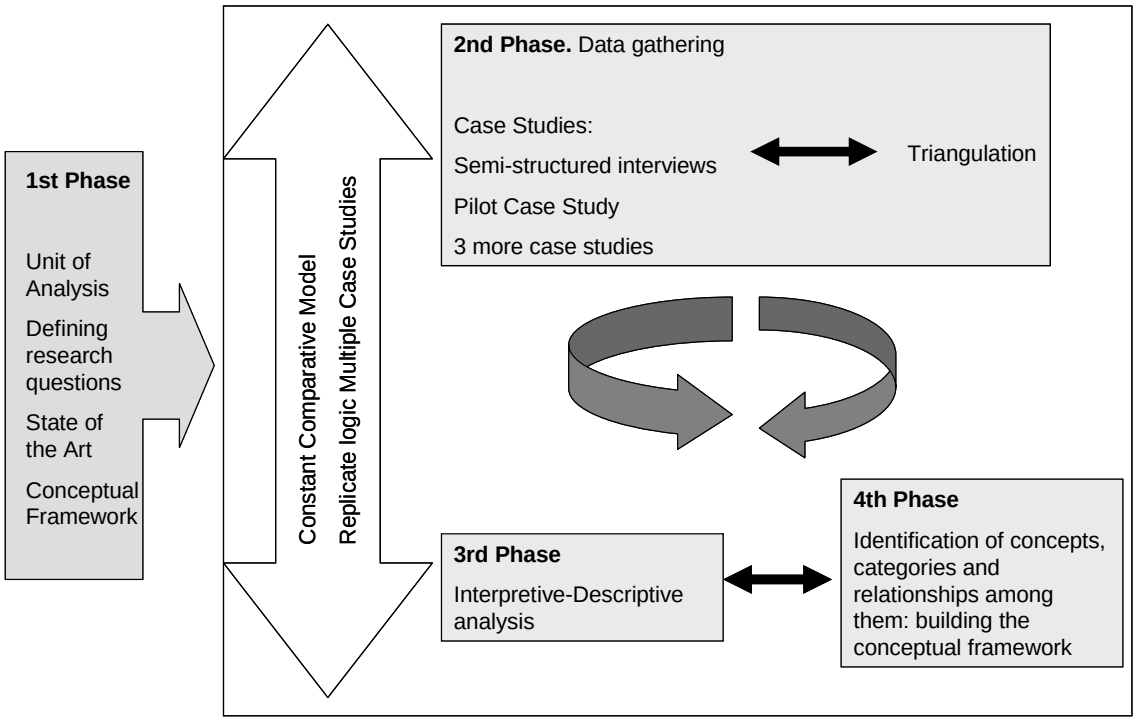
the case study strategy -, and the theoretical sampling has provided a systematic procedure to assure both the rigour of process itself and the final results.

The figure 7.5 illustrates our research design. The graph shows that the first phase of the PhD was the definition of the research questions, the conceptual framework and the unit of analysis. Research questions were posed in chapter 1 and the state of the art of the conceptual framework has been explained in detail in chapters 2, 3 and 4.

As pointed out by Corbin & Holt (2005), the driving question of the grounded theory approach should be opened and broadened to allow the researcher to discover the relevant variables that explain the phenomenon. Our main research question is: how can IC approaches benefit and improve university internal management?

The logic for challenging research questions in qualitative research is the same as in the hypothesis-testing research. Indeed, research questions are the core of the research process and should not to be overwhelmed by data (Eisenhardt, 1989).

Figure 7.5. Research Design



Source: The Author

Literature review of the theoretical framework clarifies the state of the art of the research topic, the main contributions, gaps and theories. As pointed out by Eisenhardt (1998), the theoretical framework is crucial to contextualize the research and to contrast the emerging theories, concepts or hypotheses with the existing ones.

The rest of this section focuses on the justification of the unit of analysis (first phase), and on the rationale for selection the case studies and methods used for the gathering data process (second phase).

In accordance with the grounded theory logic of generating inductive theory, the data gathering process, the analysis of the information collected and the building of a conceptual framework have all been interrelating intensively and created a spiral of knowledge.

7.3.1. Unit of Analysis: European Public University

As stated by Yin (1994), the delimitation of the unit of analysis is the "fundamental problem of defining what the `case´ is" (Yin, 1994; p.22), and should be directly related to the research questions posed.

The unit of analysis is the **research activity within a European public university**. The reasons that support this decision are described as follows.

Our first concern was public universities: **why universities?** The crucial changes that have been taking place in public European universities over the last two decades and the urgent need for these organisations to adapt to the new challenges were considered important reasons for analysing the implementation of IC managerial models in them. The university as a specific organisation has not been a priority in management literature which is more focused on business-oriented entities. However, the pressures of the context are forcing a change in our perception of the university and creating the need to understand and examine it as an organisation with management necessities like any other corporation.

Since IC models are being implemented successfully in private companies, our objective is to analyse the implications of using IC approaches in public European

Higher Education (HE) institutions. By doing so, a thorough understanding of the university governing mode and internal organisational structure has been required.

However, universities are multi-mission institutions and it would have been excessively ambitious to examine it as a whole. For that reason, our second concern was to focus on one concrete activity that, in our opinion, is being considered ever more significant in the European HE sector: research activity. Law reforms across Europe (see for instance, LOU2001 in Spain or UG2002 in Austria), performance agreements that link public funds with research results, the social and political importance of research for the development of the Europe of Knowledge defined in the Lisbon Agenda, and the new evaluation and accreditation systems for teachers that specially reward research results, make research a particularly significant activity within the HE sector.

Furthermore, it requires new management modes to orientate this research activity towards excellence.

Why a European context? Although we are aware of the heterogeneity of the European HE sector, we have considered it relevant to examine different case studies across Europe in order to add more variety and robustness to the results. Furthermore, the political initiatives that are being developed in this context are not only national, but at European level. The on-going creation of the European HE and Research Areas is the clearest proof of the political interest at this level. Last but not least, our participation in the Observatory of European Universities project previously described in chapter 7 provides us with a good basis of understanding European HE context and easy access to different universities.

Finally, since the research group and I are part of the academic community, our involvement as university members has provided the initial motivation[122] to engage in this investigation. While numerous investigations are being made in different fields to improve the understanding of multiple phenomenon, events, organisations, and individual behaviour, little effort has been devoted to understanding the organisation that facilitates all these investigations and where we work as researchers: the university and its research activity.

[122] See Chapter 1.

7.3.2. Case Study Selection

Sampling cases is an essential aspect of the theory building approach from multiple case study analyses (Eisenhardt, 1989). However, the specialised literature neither states the ideal number of cases nor the selection criteria. According to Yin (1994) we should select between one and eight, or between four and ten according to Eisenhardt (1989). There are no general rules since the research design relies on the complexity of the topic. Accordingly, the number of cases will depend on the time and resources available to the researchers, while getting the right balance between the number of cases and the depth of the analysis is also important.

Furthermore, using the theory building approach, cases should be chosen for theoretical not statistical reasons (Glaser & Strauss, 1967). In this PhD, using this logic, the cases for research were not selected randomly but according to the replication logic to extend and contrast the emergent conceptual categories. In other words, case studies were chosen in accordance with the availability of the information and their potential contribution to the overall objective of the Thesis. Moreover, all the institutions under analysis have shown an interest in the governance of the research activity, and during the last years have been immersed in important internal transformation processes which might potentially affect their governing structures and management style.

Accordingly, three public universities and one research centre were chosen: the Autonomous University of Madrid (UAM), Pablo de Olavide University (UPO), the University of Lausanne (UNIL) and SPRU (Science and Technology Policy Research):

- **The Autonomous University of Madrid** (UAM)[123] was the first case study analysed and was conceived as the `pilot case´. According to Yin's (1994) rationale, a single-study case can be used a pilot case and will be the first of a multiple case study analysis (Yin; 1994; p.42). This university was chosen for several reasons.

The UAM is located in the Madrid Autonomous Community, the Spanish region with the highest level of scientific production in national reviews with 2.24 papers per 10,000 habitants per year (COTEC, 2006). Although it was funded at the end of the 60s, it can

[123] www.uam.es.

be said that today it is one of the biggest universities is Spain, with more than 31,000 students[124] (undergraduate and postgraduate) and approximately 2,400 teaching and research staff.

From both the teaching and research points of view it has become a reference institution in the national, and even international, context. According to the data providing university rankings, it always occupies a prominent position. In the national context, according to the ranking published by "*El Mundo*"[125] for the academic year 2005-2006 it is in first position at a national level; while "*Gaceta Universitaria*"[126] ranks it second and in the ranking produced by COTEC (2006) the UAM occupies the second position for research competitiveness and sixth for research (COTEC, 2006; p.102). In the international scenario, in the academia ranking of World universities 2005, produced by the Institute of Higher Education of the Shanghai Jiao Tong University, it is considered the first among Spanish universities[127].

In addition to this, it was selected as the pilot case because of its active participation in the Observatory of European Universities Project from the first stage.

Finally, the links between the research group and this organisation facilitate the access to data and to interviewees.

Summing up, the reasons aforementioned justify why the UAM is being considered a relevant example for detailed analysis and facilitating learning about the process in order to improve the approach to the other case studies. Indeed, this case has enabled us to better outline the interview template, redefine concepts and improve understanding of the complexity of the topic under study.

- Although in the same national context, **Pablo de Olavide University** (UPO)[128] is one of the smallest universities in Spain, with less than 700 teachers and researchers and almost 9,000 students. It has been the most recent university created in the Andalusia Autonomous Community (in 1997), a region producing a low level of

[124] Source: http://www.uam.es/presentacion/datos/resumen.html.
[125] http://aula.elmundo.es/aula/especiales/2006/50carreras/index.html. This ranking analyses 50 degrees at national level.
[126] www.tugueb.com. This ranking analysed all the public universities at national level.
[127] UAM´s position was, in 2005, number 172. Http://ed.sjtu.edu.cn/ranking2005.htm.
[128] www.upo.es.

scientific papers in national reviews (0.82 papers per 10,000 habitants per? year (COTEC, 2006). In addition, in contrast to the situation in more consolidated universities, almost 80% of the research and teaching staff are not civil servants and have temporary positions. Despite being such a new Spanish university, it has shown interesting growth and development in the last two years, since the number of departments has duplicated and the number of faculties has increased by 40% (UPO Academic Report, 2005-2006).

Recently, it has published the Strategic Plan 2005-2010, which is a document defining the main aims of the university and the ways to achieve them. Interestingly, the UPO is not only in the process of implementing a Strategic Plan at centralised level, but is also insisting on the Faculties and Departments developing their own Strategic Plans, establishing performance and financial agreements. This explicit interest in managing research activity and improving performance provides us with the opportunity to analyse the framework developed within the Project and to enrich our research with new insights.

Furthermore, our particular involvement in the institution as academic members, makes access to data much easier. Accordingly, it was considered that the results obtained in the Autonomous University of Madrid were a significant example to replicate since both universities are Spanish but have completely different profiles.

- **The University of Lausanne**[129] is an ancient institution since it is possible to trace its origins back to the first half of the 15th century with the foundation of the Schola Lausannensis, whose main purpose was to educate and train future ministries of the church. The present University of Lausanne together with the Federal Polytechnic of Lausanne are now located in one of the most important university campus of Switzerland.

In recent years, UNIL has been immersed in intense processes of change in order to adapt the institution to the challenges of the new context. In 2004, a number of fundamental texts were published concerning basic aspects of the University's internal organisation. Among them, a new law defining the general aims of the university and designating the appropriate administrative bodies and the Strategic Plan. In 2005, new

[129] www.unil.ch/central.

efforts towards the implementation of the Bologna process involved important reforms in the study programmes and internal re-organisation.

Moreover, its selection as a case study is due to UNIL involvement in the Observatory Project, which has facilitated the access to data and key people. Our concern is to understand the different governing approaches and whether the national conditions affect university governing styles and their willingness to introduce managerial tools.

- Finally, the **SPRU (Science and Technology Policy Research)**[130] is a research center in Sussex University (United Kingdom).

One of the most interesting characteristics of Sussex University is that it is not organised in traditional disciplinary faculties, but in Schools. It is a large campus with 2800 graduates and 6500 undergraduate students. Its high international profile (with approximately 30% of the graduate students and 10% of the undergraduate students from outside the UK) and its transdisciplinarity make this University an attractive case study.

We have specifically focused our analysis on SPRU, which is a world leader as an institution in research, teaching and consultancy in the fields of science, technology and innovation policy. Its mission is "the growth, sustainability and responsible governance of science, technologies and innovation systems" (www.sussex.ac.uk/spru) and it has a strong interdisciplinary and international profile.

This research center is now substantially transforming its governing style in order to face the new challenges of the environment. A new Strategic Plan and a new approach to the management of the institution are being developed.

In order to validate the conceptual categories that have been emerging from the previous cases studies, we felt that rather than include an additional university, a research organisation would be more relevant by adding a dissimilar case to contrast our findings. Although SPRU undertakes teaching activity, mainly postgraduate courses (masters and PhD programmes), its main activity is research. In this way,, this case differs from the other three exercises and enables us to understand whether

[130] www.sussex.ac.uk/spru.

conditions and critical elements governing research activity in universities and research centers are the same, and if these institutions could be compared with each other. This case study is also distinctive because of the more managerial tradition of the Anglo-Saxon HE system.

7.3.3. Data Collection Process

Despite the widespread idea that the case study is an unstructured methodology, like any other research method it should have a conceptual structure in order to assure rigour. Consequently, each case study has followed four phases: (a) case study description and characterisation, (b) data collection; and (c) transcription and reporting data and, lastly, (d) analysis of data gathered and other documents. It is important to note that this has been a systematic but dynamic process throughout, and it is only for practical reasons that the four stages are shown as following a linear model. Indeed, when developing the different case studies, all the phases were developed simultaneously, overlapping each other and creating a learning process. As pointed out by Glaser & Strauss (1967) and Eisenhardt (1989), this is one of the key aspects of the theory building approach.

Regarding the data collection process, interviews have been the main source of information. However, aware of criticism of the interview as a data-gathering technique only looking into the `here and how´ of participants' perceptions" (Stark &Torrance; 2005; p. 35), we have used other sources of information such as document analysis over time as well as observation in order to complement the information obtained through interviews. This multi-method approach was described in the previous section as triangulation.

Focusing on interviews, they can be classified as structured, unstructured or group interviews (Fontana & Frey, 2000). In structured interviewing the researcher organises a number of pre-established questions which allow a limited set of answers. In general, they do not include open-questions. All the interviews are organised following the same guide and in the same order, allowing little room for improvisation. Unstructured interviews, on the contrary, do not follow a pre-determined template and consist of open-questions. Both can be developed face-to-face or using different technologies such as telephone, fax, e-mails or web sites. Finally, the so-called `group interviews´

involve questioning several individuals at the same time formally and informally. This specific technique has been widely used in marketing research with the aim of gathering information and opinions on product characteristics or advertisements.

Regarding the former classification, we can define the type of interviews carried out in this research as face-to-face structured and semi-structured interviews.

The data collection process was mainly developed in two different stages. During the first, carried out during the period September to October 2004, open interviews with key people at the UAM were held in order to have a preliminary idea about the university context and problems. This **exploratory phase** was developed in the UAM since it was selected as the pilot case for the research. As stated in the literature, in order to focus the fieldwork, qualitative researchers using case studies are advised to do preliminary work before entering into the case analysis. Preliminary document review, informal conversations, and open interviews are crucial to get a better understanding of the organisation and its context. Accordingly, seven open face-to-face interviews with academic members in different governing and administrative positions were carried out. Among others, the Vice-rector of Research and the Head of the Technology Transfer Office were consulted (see table 7.3). The results of this preliminary stage were used to (a) design the guide for the semi-structured interviews developed in the second stage of the research, (b) identify the key personnel in the institution, the crucial documents and internal reports to be analysed and, last but not least to (c) identify problems and critical issues in the governing of research activity in the university.

The information gathered in this first phase enabled us to fulfil the OEU strategic matrix for the UAM and to highlight the main emerging methodological considerations regarding the application of this analytical framework. By doing so, we encountered some difficulties that proved crucial in improving the analytical framework and the second set of interviews. Despite the diversity that characterises the European higher education institutions, this exercise showed that most of the methodological problems are similar across universities. Because of this, we have considered that the difficulties and recommendations that emerged within the process of applying the OEU Model in the pilot case study might be considered useful and valuable for other institutions within similar contexts.

Accordingly, in the second stage of the data gathering process, we accomplished (a) semi-structured interviews and (b) an in-depth review of secondary sources of information: internal reports, strategic plans, budgets for 2004-2005-2006, research and financial reports, etc., not only in the UAM but in the other three institutions that are samples in this PhD research.

During the period July 2006 to January 2007, the **second stage** was developed. Several interviews in each institution were held with the main decision-makers and other positions that were considered strategically important due to the amount of information they receive and their decision-making capacity in order to understand the governing mode better. Among others, the Rector, Vice-rectors, Deans, Directors of Departments, members of the transfer units, Head of foundations, Director of Human Resources department, and professors from different disciplines who would all have different views of the university.

The interviewees were first approached via personalised letters sent by e-mail. The correspondence provided an introduction to the researchers, the university affiliation, a synopsis of the research and a template with the selected topics to be discussed. Interviews lasted between about one and two hours (the shortest being 45 minutes and the longest two and a half hours), depending on the previous experience, background and involvement of the respondent. On most occasions, the interview was held in the respondent's usual workplace. Only one interview was conducted via telephone, owing to the fact that the interviewee was unable to have a face-to-face interview. When it was necessary, follow-up questions and clarifications of issues discussed during the interview were pursued through e-mail exchanges or telephone conversations.

Contrary to the interviews held during the first stage of the research, these interviews followed a semi-structured protocol. The interview template was composed of two parts: the first was related to the use and diffusion of management indicators in the university, and the second to the governance of the institution. It comprised a set of closed, semi-closed, and open questions[131]. Accordingly, the goals of the interviews mainly fell into two categories: (a) Evaluating the usefulness for management of a battery of indicators, previously defined by the Observatory. For that, the interviewees

[131] See Annex II for the complete template followed in the interviews.

had to evaluate each indicator using a Likert scale; and (b) Identifying the “styles of governance”, moving from the analysis of particular problems to general guidelines useful for other European universities with analogous organizational structures and similar goals.

It is important to mention that the interview process was itself a learning process that has allowed us to improve our interview technique during the research process. Indeed, for selecting interviewees theoretical sampling logic was used again.

Accordingly, the respondents were not selected arbitrarily but for their relevance to theoretical conceptualisation. In fact, additional interviews were added to the case, when the relevance of interviewing another individual became clearer during the process or following the advice of previous interviewees. Finally, when theoretical saturation was reached no more interviews were held. Reflecting on the legitimacy of these kinds of practices that may alter the study, Eisenhardt (1989) stated that since the main goal of the case study is to better understand the event under examination and to build theory and not to obtain statistical significance of the data gathered, they are even desirable.

In addition, the interview template was modified during the process and some questions were reformulated in order to better capture the relevant information. In this way, we were increasingly maximising the time in the interviews and adapting better to the different kinds of respondents.

This process has highlighted the need for flexibility in qualitative research as argued before, and has shown how, within an iterative process, the experience in one case study becomes an important input for better developing the next case.

The next table summarises all the interviews undertaken, giving information about the institution, the position of the respondent and the date of the interview. In addition, a specific code is assigned to each interview in order to refer to them in the next chapter when analysing the findings.

Table 7.3. Interviews, Dates and Positions

Institution	Date	Position	Code
UAM	14/10/2004	Professor of Music	COD1
UAM	18/10/2004	Responsible of the Research Report	COD2
UAM	19/10/2004	Head of the Technology Transfer Office	COD3
UAM	02/06/2006	Professor of Accounting and Finance	COD4
UAM	06/06/2006	Professor of Business	COD5
UAM	12/06/2006	Vice-Rector for Research	COD6
UAM	13/06/2006	Professor of History; Former Vice-Rector for Research	COD7
UAM	17/06/2006	Director of Research Institute (field of Physic)	COD8
UAM	27/06/2006	Social Council President	COD9
UAM	28/06/2006	Director of Research Institute (field of economics)	COD10
UAM	29/06/2006	Professor of Archaeology	COD11
UAM	29/06/2006	University Personnel Claiming Office	COD12
Madrid Regional Government	29/06/2006	Deputy Director of Research in Universities	COD13
UAM	30/06/2006	Dean of Economics and Business Faculty	COD14
UAM	03/07/2006	Head of the Research Administrative Office	COD15
UAM	03/07/2006	Head of the Personnel Services	COD16
UAM	04/07/2006	Management Director	COD17
UAM	01/08/2006	Rector	COD18
UPO	04/10/2006	Head of Business Department	COD19
UPO	04/10/2006	Head of Economics Department	COD20
UPO	05/10/2006	Professor of Business Management	COD21
UPO	06/10/2006	Director of the Library	COD22
UPO	06/10/2006	General Director of Human Resources	COD23
UPO	09/10/2006	Head of the Research Unit	COD24
UPO	10/10/2006	Dean of Business Faculty	COD25
UPO	11/10/2006	Head of the Technology Transfer Office	COD26
UPO	16/10/2006	Vice-Rector of Research and New Technologies	COD27
UPO	17/10/2006	Director of Research Institute (Biology)	COD28
SPRU	15/01/2007	Research Fellow	COD29
SPRU	17/01/2007	Professorial Fellow	COD30
SPRU	17/01/2007	Professor of Economics of Science and Technology	COD31
SPRU	30/01/2007	Director	COD32
SPRU	30/01/2007	Professor of Science and Technology Policy Studies (Former Director of the Research Institute)	COD33
UNIL	22/06/2006	University's Administrator	COD34
UNIL	22/06/2006	Director of Research Institute	COD35
UNIL	28/08/2006	Director of a Research Group (former Director of a Research Institute)	COD36
TOTAL	**36**		

Source: The Author

7.3.4. Data Analysis Process

Regarding the analysis of data, it is considered "the heart of building theory from case studies but it is both the most difficult and least codified part of the (research) process" (Eisenhardt, 1989; p.539).

One of the problems often identified in the literature is how to cope with an enormous volume of data. As graphically stated by Pettigrew (1988; in Eisenhardt, 1989; p.540), there is a danger of “death by data asphyxiation”. However, there is no standard for data analysis; “there are probably as many approaches as researchers” (Eisenhardt, 1989; p.540).

Considering the systematic method proposed by the GT approach, memos and interview notes were carefully examined following the micro-analysis method; which consists of studying them in-depth, which is to say, “line by line and paragraph by paragraph” (Corbin & Holt, 2005; p.50), and asking questions such as: what is the main idea that is represented here? Is it the same or different in relation to other respondents?, etc.

As mentioned before, the analysis of data was done simultaneously to the data gathering process, and its main aim was to achieve conceptualisation from the information obtained in each case study. Accordingly, the theory is “of, for and about practice” (Stark & Torrance, 2005; p. 38)

As described by Corbin & Holts (2005), in our research, the discovery of the concepts started in the first case study and with the first interviews. Further, the concepts were evolving during the process and they served as the basis for looking for further data, when necessary, and for building conceptualisation.

For our analysis, we considered it helpful to arrange and classify all the information collected in each case by considering two basic processes – `research activity´ and `research governance´ - and a number of thematic dimensions (or conceptual categories as defined by Glaser & Strauss, 1967). In contrast to the hypothesis-testing approach, the categories, their definition and the relationships among them, emerged from the analysis process and were not designated a priori. Accordingly, they evolved during the research exercise and were crucial to describe and interpret each case study and to facilitate cross-case comparison. As suggested by the specialised literature, we looked for case similarities and differences “systematically comparing the emergent frame with the evidence from each case” (ibid., 1989; p.541). By doing so, we followed the logic of the constant comparative model that characterises the GT pproach and the replicate logic of multiple-case strategy defined in previous sections.

As the specialised literature highlights, building grounded theory is a difficult task since there are no specific guidelines. However, as recommended by Corbin and Holt (2005), we tried to capture the core of participants´ contributions and present them in a framework which allows the reader to understand the phenomenon and its context. In accordance with this, our concern was to discover patterns of actions in the governing mode of different European universities and learn from different case studies.

According to Strauss & Corbin (1998), the data analysis process moved from case description, to conceptual ordering, and, in the final stage, to theorizing. In the next chapters we will, therefore, present a descriptive/interpretative section for each case, the comparative analysis across cases, and the theoretical framework emerging from it.

8. LESSONS FROM THE EUROPEAN EXPERIENCE: GROUNDED THEORY OF GOVERNING RESEARCH IN HE INSTITUTIONS

The empirical part of this PhD Thesis is twofold. On one hand, we aim to study how European HE institutions are governed and understand better what kind of practices and instruments they use, and, on the other hand, to analyse the potential of IC approaches as a managerial tool for universities and research centers.

As argued by the OEU in its final report, the university is considered to be a “black box” where it is difficult to visualise the knowledge creation process. This lack of transparency in management does not help universities to become key players in our current economy (OEU, 2006).

Furthermore, given the new pressures to account for the use of public money and the growing importance of performance agreements to assign funds in accordance with research results, government and accreditation agencies are today demanding more information from universities and research centres in the form of multiple indicators that universities need to deal with. In addition, we are witnessing an increasing interest in international and national universities ranking, such as the well-known *annual Universty ranking in the Times* or the one produced by the *Jao Tong University* in Shanghai. However, this kind of rankings only provides a biased view of universities since they only incorporate a set of partial indicators, such as the number of graduate students, the total publications in the ISI list or the number of patents. We agree with the OEU

view that this exercise can be valid and significant in the case of some leading worldwide centers, but not for the majority of them (OEU, 2006).

Accordingly, it is important to note that the objective of this PhD research is not to propose a new set of measurements just to justify the activity of our universities, but to better understand their governing mode. Hence, our main purpose is to characterize and conceptualize them with the final aim of providing a useful analysis for university managers and policy makers.

Since the mid-90s, there have been studies worldwide, although mainly in North American and Australian universities, which specifically refer to this topic. As stated by Lombardi et al. (2002) "public university governance and (its) organization, a topic for scholarly interest since the pre-war years of the 1930s, became a major concern in most states throughout the last half of the twentieth century and continues to preoccupy institutions, their governance boards, and their political supporters into the early years of this century" (Lombardi et al., 2002; p.5). Nonetheless, the debate has been mainly focused on the size and composition of the university governing bodies (Edwards, 2000; p.2). If we concentrate on Europe, despite the attempts to reform HE institutions at national level and throughout the creation of the European HE and Research Area, few studies have analysed the problems and main characteristics of their internal governing structures, with probably the exception of the UK where more pro-active initiatives have been developed to change university governance arrangements since the end of the 90s[132].

As described in chapter 7, the recently concluded Observatory of European Universities, has been the first attempt to create a comprehensive framework for university strategic management, and the issue of "university governance" was included as one of the key aspects under analysis. However, it was incorporated as a thematic dimension of the Strategic Matrix. Our concern is that Governance should be taken in as a transversal issue since it affects and influences the rest of variables. In fact, its transversal condition was acknowledged by one of the most pro-active researchers of the Project, Christin Muselin, in the final international meetings of the project held in Lugano last December 2006.

[132] See, for instance, the White Paper on University Governance published in 2006 by University of Oxford.

From a macro-level point of view, other tools such as the mapping instrument used by AQUAMETH[133] or the aforementioned international rankings can be considered valid instruments to position our universities in a broader context. Despite their benefits, these instruments provide little information about how these institutions work, organise, and transform their inputs into outputs. In other words, they give us a static picture of the university at a given moment but do not incorporate a dynamic perspective which would give an idea of the potential and weaknesses of the organisation. In our opinion, only a better understanding of the governing style and internal management procedures and techniques in our universities will enable us to improve their performance and steer them in a specific direction.

As laid out in chapter 4, HE and research institutions are much more complex due to the fact they have to deal with a wide range of goals – teaching, research and third mission activities - under efficiency, effectiveness and excellence criteria. Accordingly, we believe that their governance should be considered a crucial issue at academic level and also as such on the political agenda. Quoting the White Paper on University Governance from Oxford published recently: "the success of a university of this scale and ambition depends on excellence in all of its activities, including its governance arrangements" (University of Oxford, 2006; p.7).

Multiple external pressures, such as the higher level of competition, the national HE reforms, financial constraints and the EU efforts to create the HE Area and the Research Area, are presented in the specialised literature as the main driving forces to re-think university activities and their management. As a consequence, strategic plans and other managerial tools are being increasingly implemented. However, **are these new concepts being applied just as another mandatory question or are universities changing the way they conceive of themselves and the way they manage their affairs? Is it a "cosmetic" change or is something really changing in the HE sector?**

Using what has been learned from the exploratory work done by the Observatory and the AQUAMETH project, in this chapter we will take a step forward by analysing the main variables that affect the governing activity in European universities and

[133] See Chapter 6.

characterise different styles of governance using the Grounded Theory logic. Some political recommendations can be drawn from this analysis.

As broadly explained in the previous chapter, in order to fulfil this ambitious objective, qualitative fieldwork has been done in four institutions from three different European countries. By working on these four case studies, we have revealed what the key variables are in defining the governance of HE institutions and the relationships or links among them using the GT logic.

The chapter begins by defining the term “governance” and its implications in HE institutions. Then, from a descriptive point of view, we present a characterisation of the governing mode of each case study taking into account two dimensions: above the institution and within the institution. This descriptive part of the analysis has allowed us to make a comparative analysis of the organisational structures and governing styles of the four institutions and helps us in the process of coding and conceptualisation. In Section 3, the main concepts and categories that have emerged from the empirical analysis are presented, and in Section 4 we analyse the implications of university governance characteristics for the implementation of IC approaches. Finally, some conclusions and political recommendations are drawn.

8.1. What is `University Governance´?

In general terms, as the specialised literature recognises, the term `governance´ is especially complex to analyse and even more difficult to implement given the multiple stakeholders and actors that are involved in organisations. In a broad sense, this term refers to the “processes of decision-making within an institution” (University of Oxford, 2006; p.5), involving a set of relationships between the organisation’s internal management board, its shareholders and other stakeholders (OECD, 1999; p.2).

At firm level, in recent decades corporate governance has been considered a key element in improving economic efficiency in industrialised countries (OECD, 2004b; European Commission, 2002). In fact, “in virtually every EU Member State interest in

articulating generally accepted principles and best practices of corporate governance is evident"[134] (European Commission, 2002; p.2).

Actually, the existence of codes of good practices in corporate governance has proven to be beneficial in a number of different ways (European Commission, 2002; p.6):

- Stimulating discussion of corporate governance issues;
- Encouraging companies to adopt widely-accepted governance standards;
- Helping explain both governance-related legal requirements and common corporate governance practices to investors;
- Being used to benchmark supervisory and management bodies; and
- Possibly helping to prepare the ground for changes in securities regulation and company law.

Despite the differences between the public and private sectors explained in chapter 2 and acknowledging that those differences should be taken into account in the analysis[135], `governance´ in public organisations is also explicitly recognised as a crucial issue to improve public sector institutions´ performance. In the words of the Corporate Governance Report of the Audit Commission, "poor public sector corporate governance is at the heart of many public service failures" (Audit Commission, 2003; p.2).

In focusing on universities, defining `governance´ is particularly difficult since they are complex organisations with various activities and goals, possessing a number of specific characteristics that make them unique (Sporn, 1999).

As stated by the Deputy Vice-Chancellor Director of the National Institute for Governance of the University of Canberra, `university governance´ is about how an organisation steers itself and the processes and structures used to achieve its goals.

In a similar way, the OEU defines this concept as "the way an institution is managed and capable of linking day-to-day actions to the implementation of strategic objectives"

[134] See for instance the Aldama Report (2003) and the Olivencia Report (1998) for Spain, Cadbury Report (1992) for UK; Viénot Report (1995) for France; Peters Report (1997) for The Netherlands; and Cardon Report (1998) for Belgium.
[135] For instance, as Edwards (2000) highlighted, the government is a more important stakeholder in public institutions than private ones.

(OEU, 2006; p.172). It includes the decision-making process at all levels, the definition of strategic long-term objectives, and the way conflicts are addressed (OEU, 2006).

According to Marginson & Considine (2000), it is concerned with the universities´ values, their systems of decision-making and resource allocation, their mission and purposes, the patterns of authority and hierarchy, and the relationships with external partners.

As deduced from the above definitions, `governance´ means less about what organisations do and more about how they do it.

The next question that arises in the analysis is: what do we understand by `good governance´? Obviously, there is no one generally accepted model of good governance, but some key elements can be highlighted.

According to the Australian National Audit Office's (ANAO) definition of "good corporate governance": it should include the "processes and structures which will facilitate decision-making and appropriate delegation of accountability and responsibility within and outside an organisation. This should ensure that the varying interests of stakeholders are appropriately balanced, that decisions are made in a rational, informed and transparent fashion and that those decisions contribute to the overall efficiency and effectiveness of the organisation" (ANAO 1999; p. 2, cited in Edwards, 2000; p.4). This general approach can be applied to both the private and public sector.

Using the same thinking, Edwards states that "good governance" should include the following aspects: accountability, transparency and effectiveness (Edwards, 2000; p.3). According to these ideas, in order to analyse `university governance´ there are key aspects that should be taken into consideration (OEU, 2006; p.173):

- The way governors are selected
- The way laws and internal regulations are prepared and implemented
- The way management decisions are taken and implemented
- The way change is organised and permitted
- The way conflicts are discussed and solved
- The evaluation and accountability of the work and actions of the organisation.

In practice, when trying to analyse the governance of universities numerous methodological problems arise. This is not only because `governance´ deals with political decisions but because it is a comparatively new topic on the political agenda and for academic concern, and there is no systematically collected data. It is a qualitative issue in nature. For all these reasons, as explained in the previous chapter, in this PhD research we have chosen a qualitative methodology following the GT approach.

8.2. Descriptive-Interpretive Analysis: Characterising University Governance

Although we consider all the functions of the university as equally important, given the high degree of complexity of the HE institutions and their multiversity approach, this PhD investigation has focused mostly on the research activity. Further efforts will be required to better understand the governing of teaching and third mission activities.

As recommended by the Observatory of European Universities in its final report (OEU, 2006; p.176)[136], in addition to the interviews, we have analysed the available strategic documents and reports including quantitative and qualitative data (see table 8.1) in order to characterise the governing structure of each institution under study.

HE institutions across Europe are organised in different ways and diverge in governance styles and mechanisms. It is, therefore, difficult to analyse, evaluate, and compare them without a previous categorisation. In our opinion, it is very important to define the main governing elements in each institution in order to better understand its priorities and ways of management. If we are not able to understand how HE institutions are managed, how their strategic objectives are defined or what kind of managerial mechanisms they use, international rankings and other sets of indicators will not help to improve HE institution's performance.

In addition, when applying the qualitative methodology of multiple case studies Yin (1994) suggests including a descriptive analysis of each case before the cross-

[136] The OEU recommends different steps of analysis in order to build a first set of indicators for universities: characterization of governance; analysis of the available strategic documents; coherence between strategic documents and "facts"; existing instruments to monitor the implementation of strategies; and governance style.

analysis. By doing this, not only will the researcher have a clearer and more comprehensive view of the phenomenon but the reader will too.

Table 8.1. Strategic Documents Analysed for each Institution

Documents identified and analysed at UAM:
▪ Legal Statutes of the University ▪ Annual Academic Report 2006, 2005 and 2004 ▪ Annual Budget 2006 and 2007 ▪ Research Plan 2003-2006 ▪ Follow-up of the Strategic Plan 2003-2006, ▪ Report on UAM Research Activities 2005, ▪ Annual University Senate (Claustro) Reports. ▪ Reports (formal or informal) made by organizations at different level(s) (i.e. Research Commission). ▪ "Por la Autónoma 2010": Rector's Programme - Angel Gabilondo. UAM 2006. ▪ Other documents and statistical data from internet, web page: www.uam.es
Documents identified and analysed at UNIL:
▪ "Vision stratégique": It includes strategic choices with respect to the general university profile, the situation in the local and national HE area and the collaboration with other HE institutions. ▪ "Loi sur l'Université de Lausanne", which includes information about the relationships between University and State (Canton), rectorate and University Council, rectorate and faculties. ▪ "La charte de l'Université de Lausanne", which includes ethical values on which the strategic vision is based. ▪ "Rapport d'activité 2004 and 2005". The annual activity report makes an assessment of the goals achieved as defined in the strategic vision. ▪ "Convention Sciences-Vie-Société (SVS)". This document defines one of the main programs of the University that includes research. It also defines the relationship between the three higher education institutions involved in this program, i.e. Universities of Lausanne (UNIL) and Geneva and the Federal Institute of Technology of Lausanne (EPFL). ▪ "Accord de collaboration". This document defines the inclusion of more scientific subjects in the SVS program, and the collaboration between the university and the cantonal hospital. ▪ Annual Management Report 2005 ▪ Statistical report 2005-2006 ▪ Other documents and data from Internet, web page: www.unil.ch
Documents identified and analysed at UPO:
▪ Legal Statutes of the University ▪ Legal regulation of the Administration Council of Pablo de Olavide University, March 1999 ▪ UPO Strategic Plan 2005-2010. ▪ UPO Strategic Plan 2005-2010, Review for 2006 ▪ Annual Academic Report 2006 ▪ Annual University Senate (Claustro) Reports. ▪ Balance Score Card 2005 (internal document) ▪ Strategic Plan of the Department of Business Administration (Document in progress, Internal Document) ▪ Research Report 2004 and 2005 ▪ Other documents and from Internet, web page : www.upo.es
Documents identified and analysed at SPRU (Sussex University):
▪ Strategy for Widening Participation 2001-2004 (Sussex University) ▪ The Organisation of the University 2005-2006 ▪ The University of Sussex Corporate Strategy, March 2001 ▪ University of Sussex, Annual Review 2003/2004 ▪ Facts and Figures 2003/2004 ▪ "Counts with Us" Financial Statements 2003/2004 ▪ SPRU Strategic Plan ▪ Other documents from Internet, web pages : www.sussex.ac.uk and www.sussex.ac.uk/spru

Source: The Author

In this PhD research, analysing the four case studies and comparing their internal governing mechanisms has helped us not only to better understand the management systems of each university and identify similarities and differences among them but also to get some hints about how to develop the GT conceptual framework.

By analysing the governing mode of HE institutions, we do not aim to present an ideal organisation paradigm, since we believe there is no perfect organizational model or governance style. A management mode should be mainly assessed regarding the organisation's strategic objectives and the degree of achievement. It can, therefore, be said that although best practices and interesting lessons can be drawn from successful experiences, each university should be made to think about its own needs and profile and, hence, develop the governing mode considered the most appropriate given its context and potential. For this reason, we highly recommend that each institution undergoes an internal reflection process and learns what its value creation process is, identifying its main strengths and weaknesses.

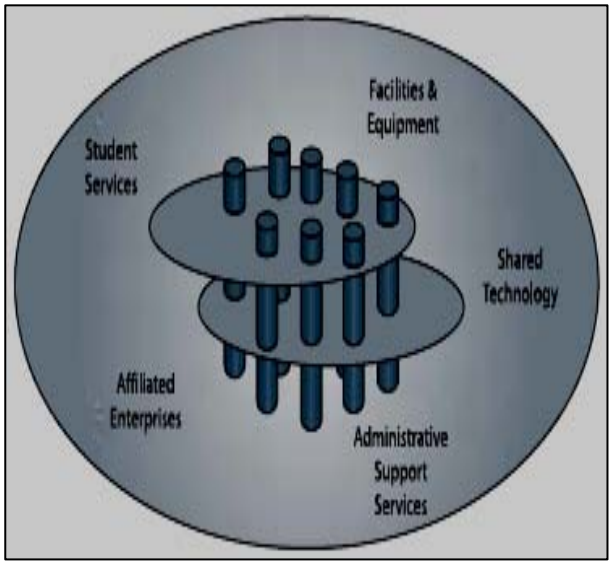
When analysing the university governance structure we take into account not only the faculties and its departments where the researchers and teachers are working, but also the institution as a whole and its regional and national environment.

Accordingly, to characterise universities we distinguish two dimensions (OEU, 2006):

- Above the university:

This analysis will provide university managers with information about the public and private institutions that can constrain or bound university activity and help them to understand the limits and the real margin of manoeuvre they have to organise and administrate the institution.

Figure 8.1. Academic Core and its Broader Context

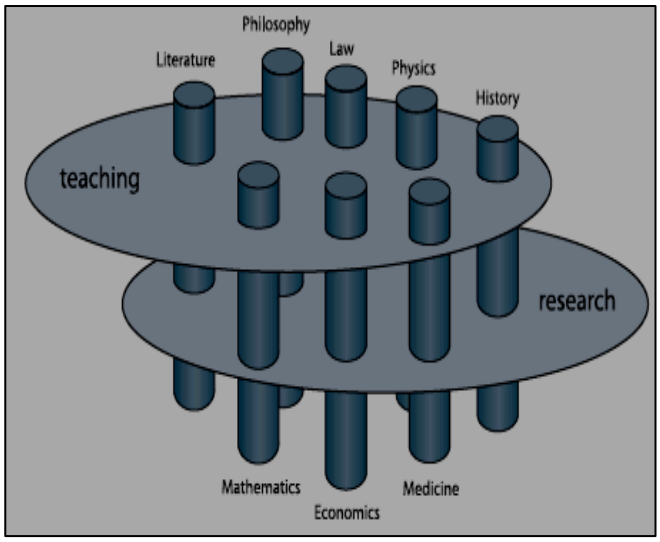


Source: Lombardi et al. (2002; p.4)

Figure 8.2. Academic Core

- Within the University:

This dimension includes issues related to the internal organisation of the university. Among them, the university structure, the main governing bodies at all levels, the existence of technology transfer offices and other joint centers or companies associated with the university, and the implementation, or not, of managerial tools, such as a Strategic Plan.



Source: Lombardi et al. (2002; p.4)

In line with this, the following sub-sections present a characterisation of the four HE institutions under study, taking into account both levels of analysis.

8.2.1. Characterisation of Autonomous University of Madrid

Above the university

Although public universities and colleges have the power to make their own rules, they have to obtain authorization from the Public Authorities at regional levels for their internal organization and their Statutes.

Regarding the research activity, we can distinguish two levels. At national level, the research activities at the UAM are affected by the programs developed by the Ministry of Education and Culture (MEC), which defines the priority lines of research which deserve funding through competitive research projects under the R&D Plan.

At the regional level, there is a Regional Research Plan developed by the Madrid Regional Government (CM). This Plan allows a part of the funds obtained by Universities from Madrid Community to be allocated to those priority lines decided by the university. For the period 2006-2010, the regional Government is implementing a

mechanism by which 30% of the basic public funding[137] will be for research activities, linked to research results (Comunidad de Madrid, 2007)

Within the University

The UAM is a Spanish public university founded in 1968 where teaching and research activities are considered of equal importance. It can be defined as a generalist university that offers studies and programs in all the six Frascati scientific fields[138].

The University is organised hierarchically in faculties and departments located in the campus "Cantoblanco", with the exception of the Medical Faculty and the Nursing School, which are located in Madrid next to one of the main hospitals of the Region. In addition, there are other Labs located in the campus which only belong to the UAM and Labs which are part of the Spanish Research Council (CSIC). This latter situation makes it difficult to define university boundaries in relation to research.

In addition, Madrid's Scientific Park is also located in the Cantoblanco campus. It came about through a joint initiative of the UAM and Complutense University of Madrid (UCM), and the later participation of the Spanish Research Council (CSIC) and other private institutions. It was created to foster quality research in areas that require the interaction of different disciplines and institutions and to propitiate the collaboration of public institutions with the business sector.

Spanish universities are characterised by collective styles of governance. These styles are based on the existence of plural decision-making committees that act as organs of government.

At centralised level, the main governing body is the University Governing Board. Besides this, there is a Social Council which includes professional association representatives, local Council representatives, and prestigious people at national and regional levels who represent society as a whole. This Council supervises the main strategic lines of teaching, research, human resources, and financial resources and

[137] The total public funding of the Madrid Regional Government is distributed as follows: 85% corresponds to basic public funding (70% will be allocated for teaching and 30% for research); 10% corresponds to funding linked to objectives and 5% to singular needs (Comunidad de Madrid, 2007; p.8).
[138] See Chapter 6, Table 6.5 for Frascati scientific fields.

has the responsibility of approving the budget. Although the role of the Social Council appears to be very important, in practice it plays a more reduced role than desirable.

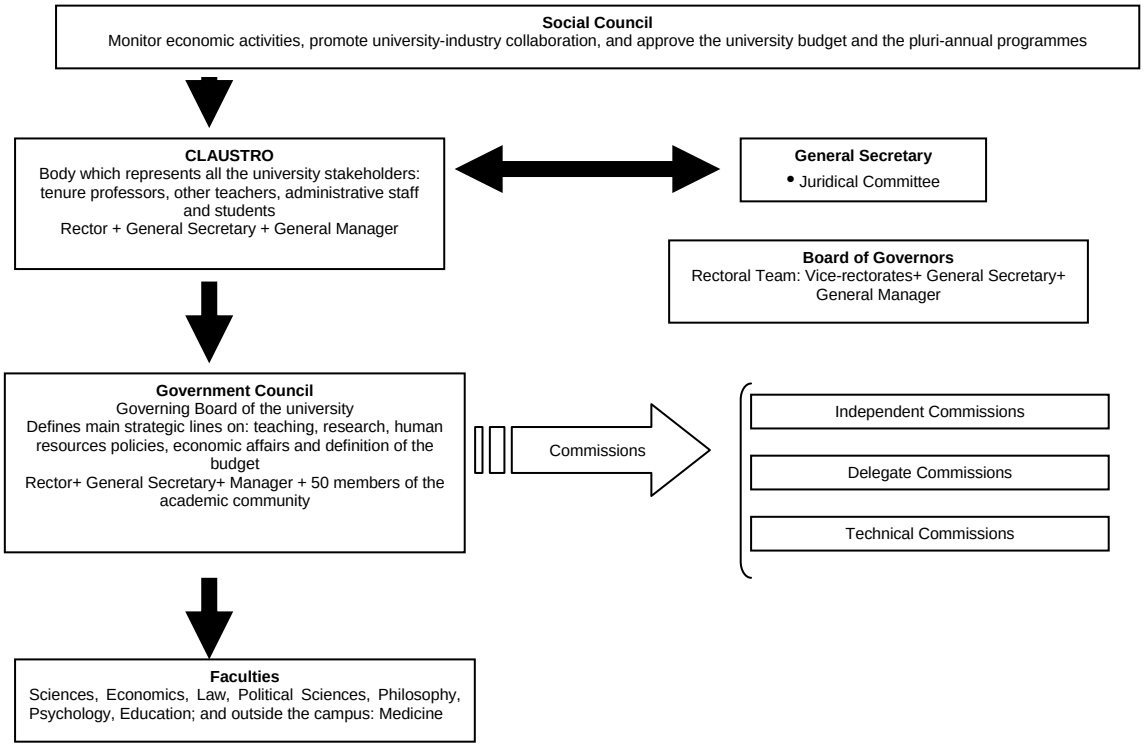
This organisational structure assures the representation of all the groups of the institution. One of the most outstanding characteristics of this collegiate model is that the Rector is democratically elected by the academic community every four years. The candidates are academics with a recognised prestige in their disciplines and an active role in academic life. He or she selects the members of the Governing Board.

The Councils governing the Faculties and Departments, known as the Faculty Board and Departments Council respectively have a similar organisational structure. Figure 8.3 illustrates the organisation chart of the institution and the main tasks of each governing body.

As regards research, the main Unit that deals with this activity is called the Vice-Rectorate of Research. Its main function is to help the Rector in the management of research activities. In addition, there is a Research Delegate Commission whose main task is to coordinate and manage the research activities at the university. It has twenty-two members: Vice-Rector of Research, Vice-Rector of Infrastructure and Technological Promotion, eight Faculty Deans, two Civil Servant professors' representatives, department directors' representative, six Non-civil Servant teachers' representatives, one administrative staff's representative, one students´ representative, and the Director of the Administrative Research Office.

In addition, the UAM has a Technology Transfer Office (hereafter: TTO) which is the institutional channel that informs, gives advice and support to the R&D management in the academic community and acts as a link with the outside world. This organization is part of the General Foundation of the UAM (FUAM). It has 12 members: the Director and eleven administrative staff representatives allocated to four areas: knowledge management, Technology Diffusion, Promotion of Innovation in firms, and Biotechnology Innovation.

Figure 8.3. Outlines of the UAM Organisation



Source: The Author

Furthermore, the university at centralised level is responsible for managing the administrative and bureaucratic processes derived from the research projects: the `Research Service´. While this Unit is responsible for assisting the administration of regional, national or European competitive projects, the TTO supports the management of non-competitive projects and contracts with private firms or other public organisations. The above mentioned Scientific Park can also help to deal with the research activities funded by external agents.

The Statutes of the Autonomous University of Madrid (2003) and the Strategic Plan 2003-2006 were approved at centralised level. In the case of the UAM, the first Strategic Plan was developed for the period 2003-2006. Four thematic actions were developed, each of them involving several projects. One is related to research and innovation activities in the UAM, and is called the Research Strategic Plan.

The Plan was initially fostered by the government team, which created a Committee formed by the Rector, the Management Director, the Vice-Rector of Planning and

Quality and the Vice-Rector of Institutional Coordination, Communication and Information. In the process of design, different working groups were created, and one of them was specifically engaged in research activity. The members of each working group were selected by the Rectoral team taking into account their experience, prestige and knowledge of the topic. The result was a brief document produced by every working group that would serve as the base for the final design of the Plan.

Its implementation was led by the Rectoral team, whose intention, in principle, was to involve all the groups concerned in the academic community and to encourage a transparent process that could be followed by the whole community (UAM, 2003b; p.73).

To finalise the work, the evaluation and follow-up process is being done basically by the Rectoral team. There have been some meetings which have been open to the whole academic community.

Besides the above, an Office for the Strategic Plan was created in order to deal with all the issues related to the Plan: design, implementation, evaluation and follow-up.

As mentioned before, the university is organised in eight Faculties: Sciences, Law, Philosophy, Psychology, Medicine, Economics and Business, Education and Polytechnic.

Each Faculty has a Faculty Board. However, it is important to mention that this body does not define research areas and mainly discusses issues related to teaching activities. One of its main tasks is to allocate funds among the faculty departments. Each faculty is constituted by a number of departments according to the knowledge areas. Its composition is as follows: Faculty Dean, Vice-Deans, Secretary Faculty, Directors of each Faculty department, Manager of the Faculty. The total number of the Board depends on the number of teachers and the Faculty departments.

At the department level, the Departments are, in theory, responsible for both teaching and research. However, in practice, the time devoted to research is decided by teachers according to their individual circumstances. The Department Council is in charge of preparing and planning the teaching activities and credits allocation among teachers. This Council is comprised of all the professors and representatives of

associate and assistant professors, plus representatives of the administrative staff and the students.

The Human Resource policy at Spanish universities should be seen in the light of the general national context of the new Organic Law for Universities, LOU (Ley Orgánica de Universidades, 2001)[139]. This law has meant an important change in the concept of teaching and research personnel (PDI hereafter) in the university, directly affecting the new contracts from 2003 on. The most important transformations are: (a) All the teaching, research and administrative personnel are now answerable to the law applied in private companies; (b) A series of stages are established in the teaching career that require teachers to go through a process of national or regional accreditation to get access to the next stage.

The next figures (8.4, 8.5, 8.6 and 8.7) illustrate some of the most relevant data on budget and human resources in the UAM.

Figure 8.4. Distribution of Research and Teaching Staff by labour categories*

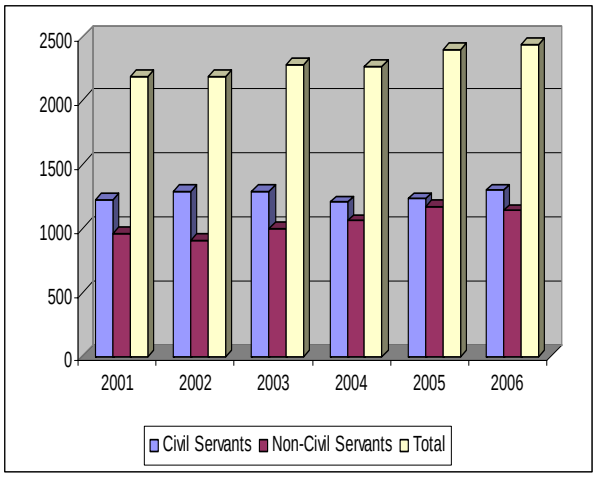
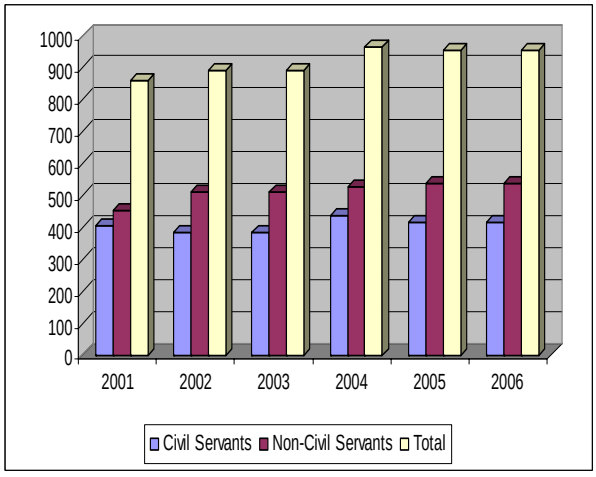


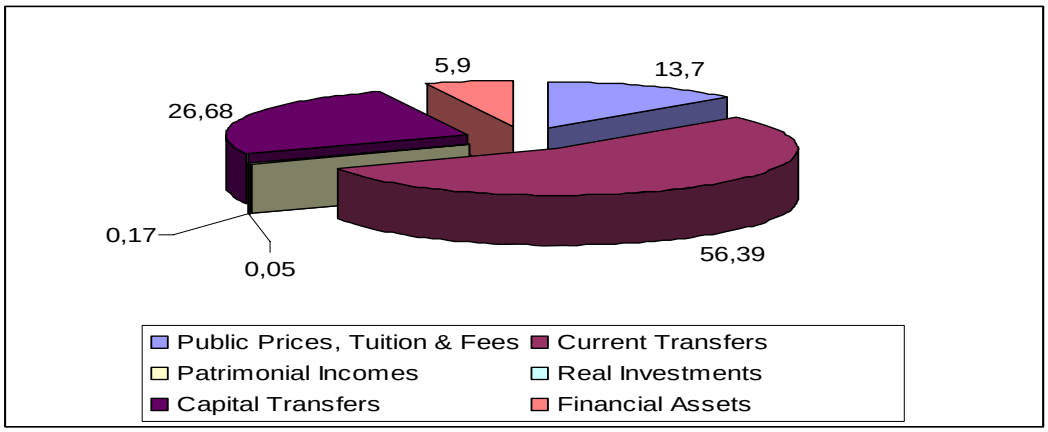
Figure 8.5. Distribution of Administrative Staff by labour categories



Source: The Author, based on data from http://www.uam.es/presentacion/datos/pdi.html and UAM (2006)
*Period 2001-2006, Data 1stMarch 2006

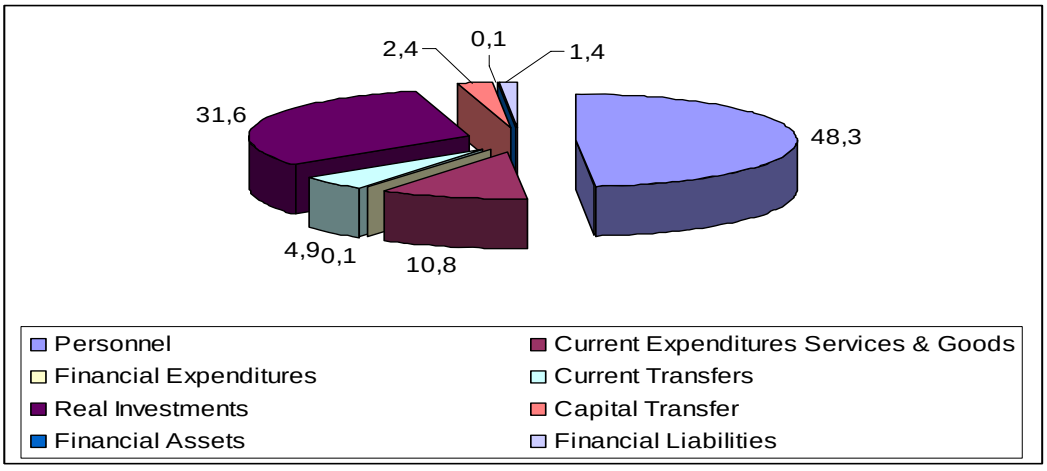
[139] The LOU is now the Parliament for the modification of some of its articles. For further details see: www.mec.es/mecd/gabipren/documentos/anteproyecto_de_reforma_de_la_Lou_2006.pdf. The new LOU will be implemented in the new academic course 2007-08.

Figure 8.6. University Income 2007 (data in percentages)



Source: The Author, based on data available at http://www.uam.es/novedades/presupuesto_2007.pdf

Figure 8.7. University Expenditure 2007 (data in percentages)



Source: The Author, based on data available at http://www.uam.es/novedades/presupuesto_2007.pdf

8.2.2. Characterisation of Lausanne University[140]

Above the university

The "cooperative" federalism that characterises Switzerland's political system also has an impact on the Swiss HE and research systems. It can, therefore, be said that there is some overlap between the tasks and duties of the Cantons and the Confederation.

[140] I acknowledge the helpful comments and suggestions of Lukas Bashung and Gaëlle Goastelec from Lausanne University to complete this subsection.

From the organisational point of view, at the federal level, the education and research policy is managed by two Offices which are part of two different Federal Departments: (a) the Federal Department of Home Affairs: the State Secretariat for Education and Research (SER); and (b) the Federal Department of Economic Affairs: the Federal Office for Professional Education and Technology. At present, the question of merging both offices into one department is on the political agenda.

At the cantonal level, the governments are politically responsible for universities, particularly the Directors of the Departments for Education. The latter are united at the national level in the Swiss Conference of Cantonal Ministers of Education (EDK).

Concerning the issue of funding, Swiss universities have several funding sources for public research that can be distinguished at different territorial levels and two types of funding: project funding and institutional funding.

At the federal level, there is (Perellon, 2001): (a) The Swiss National Science Foundation (SNSF) which essentially supports basic research (80%), and (b) the Innovation Promotion Agency (CTI)[141] that supports projects in applied research (mainly in nanotechnology, micro-systems, information and communication technologies and life sciences) with the main aim of generating innovations from industry-academia alliances. In addition, the Agency promotes start-up companies and the entrepreneurial spirit in universities.

Based on the number of students and the duration of their study programmes, the SER allocates resources to the cantonal universities for teaching on a block-grant basis (70% of the whole funding). The other part (30%) is allocated through performance agreements according to the university's research results.

Finally, the Swiss University Conference (SUC) is the joint organization for the cantons and the Confederation for university politics. It finances research projects by means of its programme "cooperation and innovation". Furthermore, among its main tasks, we can highlight: periodical assessment of how National Centers of Competence in Research are allotted with respect to distribution of tasks among universities

[141] The CTI is the Swiss Confederation's innovation promotion agency. For more than 60 years it has supported the transfer of knowledge and technology between business and universities. See: http://www.bbt.admin.ch/kti/index.html?lang=en.

throughout Switzerland; recognition of academic bodies and courses; issuing directives on teaching and research evaluation; and, issuing directives on knowledge transfer in research[142].

Moreover, cantonal universities' research is financed by the budget part coming from the home canton.

Within the university

UNIL can be considered an ancient university whose origin was the Schola Lausannensis which consisted of a college and a chair of theology. Its initial purpose was to educate and train future ministers of the church. The present University of Lausanne and the Federal Polytechnic of Lausanne are now located in one of the most important university campus of Switzerland.

Recently, the University has gone to great lengths to adapt to the challenges of the new context. In 2004, a number of fundamental documents were published concerning basic aspects of the internal organisation of the University. Among them, a new law that defines the general aims of the university, denotes the procedures to be followed in achieving these aims, and designates the appropriate administrative bodies responsible for their implementation. There is also the Strategic Plan, which defines the main areas of academic interest related to teaching and research.

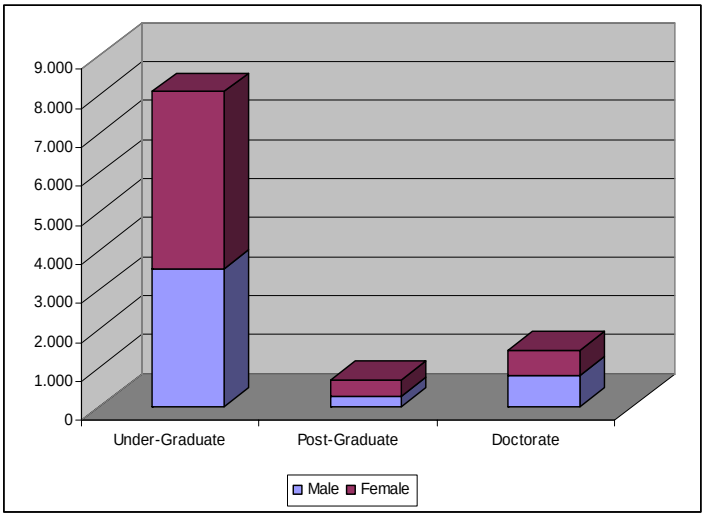
As illustrated on the university web site, these endeavour to "reflect the dynamism and forward-looking policy of the University of Lausanne" (www.unil.ch/central/page2388_en.html).

In 2005, further efforts towards the implementation of the Bologna process involved important reforms in the study programmes and internal re-organisation.

The University of Lausanne follows a disciplinary approach and is composed of 7 Faculties (Theology and Religious Studies, Law and Criminal Justice, Arts, Social and Political Sciences, Business and Economics, Earth Science and Environment, and Biology and Medicine) where more than 10.000 students and 2.200 researchers work and study (see figure 8.8 and 8.9).

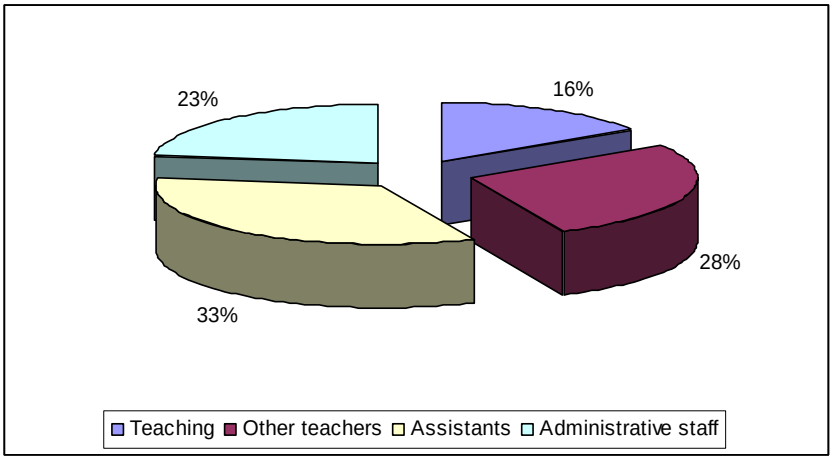
[142] See http://www.cus.ch/wEnglisch/portrait/index.php

Figure 8.8. Total number of students enrolled for the winter term 2003-2004



Source: The Author, based on data available at http://www.unil.ch/central/page2389_en.html

Figure 8.9. Personnel Employed (01/01/2005)*



Source: The Author, based on data available at: http://www.unil.ch/central/page2389_en.html
* Including those with a contract, and those working full time but without a contract. *For the University clinics, only teaching staff is taken into account.* Personnel financed solely by the State of Vaud.

The University of Lausanne is not located in one campus, but spread over three sites, the biggest being at Dorigny near Lake Leman where six of the seven faculties are located. The second one is near one of the major hospitals in the region, and the third is located in close proximity to the Swiss Institute of Experimental Research on Cancer (ISREC) and the Ludwig Institute of Cancer Research.

Concerning the internal governing bodies, the so-called Directorate is the most important management body in the UNIL, together with the University Council. The

Directorate is composed of the Rector, academics and administrative/technical representatives from different sectors of the University.

The University Council is the legislative assembly of the University. It is composed of 44 members distributed as follows: 18 members of the professorial body, 8 members of the intermediate body, 6 members of the administrative and technical staff, and 12 students. Each body elects its representatives separately in each faculty. The (renewable) mandate lasts 3 years, except the students' mandate which lasts only 2 years. This body is responsible for approving the management of administrative policy and accounts and adopting the annual progress report relating to the long-term strategic plan of the University. Interestingly, regarding its formal attributions, there is no explicit responsibility for research activities. Nevertheless, it may influence research issues indirectly via other routes, such as:

- Adopting internal regulations on the general organisation of studies and research.
- Giving an advance opinion on the pluri-annual strategic plan and adopting the report on its follow-up.
- Proposing a candidate for the rector's position in the cantonal Government.

Moreover, there is a Research Commission that has the responsibility of granting research fellowships for one year to doctoral students. These fellowships are funded by the National Science Foundation.

At intermediate level, each faculty has a Faculty Council composed of representatives of the faculty community: professors and lecturers, administrative and technical personnel, and students. Like the UAM, the Faculty Councils at UNIL do not include research as one of their main tasks.

The faculties are organized in different ways. Generally, they are oriented towards research, teaching or both. Some are structured in institutes, others in departments, sections or also centers. Although certain units focus very strongly concentrate on research, no official list of laboratories exists for the University of Lausanne. These research-intensive units may be part of institutes or constitute a unit itself inside the faculty but without being part of an institute or a department. For example: CRAPUL (Centre de Recherche sur l'Action Politique de l'Université de Lausanne) is part of

IEPI (Institut d'études politiques et internationales). Sometimes, labs are even inter-institutional, such as the so-called IRIS (intégration, régulation et innovation sociale), which is the result of the collaboration of different institutions.

Moreover, the University has a joint unit of Technology Transfer with the University Hospitals of Lausanne, denominated PACTT. Its mission is to promote the transfer of the Institutions' technologies to the marketplace for society's use and benefit, by licensing its patented inventions. This Office, whose annual report is published, reports quarterly to a Managing Committee composed of the Director of the University Hospitals of Lausanne and the Rector of the University of Lausanne. It is an office composed of only three people: one with a PhD in molecular biology, another, expert in intellectual property, and a third, responsible for communication.

Surprisingly, the UNIL legal framework does not mention the existence of the PACTT which would indicate that there is no existing formal (legal) attribution.

Interestingly, all professors are formally obliged to devote approximately 30% of their working time to research.

As explained before, several actors at different levels finance the Swiss HE and research institutions. However, as a consequence of the interrelation of teaching and research in the Swiss HE landscape, it is almost impossible to distinguish what percentage of funds allocated at federal and cantonal level is employed in research and teaching (Perellon, 2006).

This close interrelation of teaching and research and the governance structures before mentioned make it rather difficult to monitor and manage research activity separately from that of teaching. As mentioned in the OEU´s Report "this makes the Swiss HE and research system a relevant case of multi-level governance" (OEU, 2006; p.204).

The Strategic Plan, in the case of the University of Lausanne, is called "Strategic Vision". It does not seem to be evaluated regularly as such. However, according to the LUL (art. 24), the university has to periodically issue a report on the follow-up of this

Strategic Plan for the cantonal Government. The report has to be adopted by the University Council[143].

Finally, the UNIL budget for 2004 was approximately 260.6 million Swiss Frs (a budget composed of subsidies from the State of Vaud (158.5m) and the Confederation, plus contributions from other cantons, and revenue generated by the University).

8.2.3. Characterisation of Pablo de Olavide University

Above the university

As mentioned when talking about the UAM, Spanish public universities and colleges have the power to make their own rules, although they need the authorization from Public Authorities at regional levels for their internal organization and their Statutes. The Pablo de Olavide Statutes were approved in January 2003.

Focusing on their research activity, there are two levels of analysis given the structure of Spain in Autonomous Communities. At a national level, research activities are affected by the strategic lines and programs mapped out by the Ministry of Education and Culture (MEC). At the regional level, the Andalusian Regional Government has recently published a new funding agreement for public universities for the period 2007-2011(Junta de Andalucía, 2006). This Plan has set the objective of assigning 1.5% of the Andalusian national product for public university funding in the mentioned period (from the current 0.96%). Furthermore, it states that 70% of that amount should be allocated by the Regional Government (Junta de Andalucía) and the rest by other public and private funds.

The total resources are grouped under three general headings: teaching (60%), research (30%) and innovation (10%). Concerning the research funds, 10,8% will be assigned taking into account structural expenditure (such as research staff), 10% will be allocated depending on the research results, and the rest (9,8%) will be distributed through competitive projects and research groups.

[143] LUL, art. 29, al. h.

Within the university

Pablo de Olavide University is the most recently founded public university in Andalusia. Created in 1997, it can be defined as a generalist university spread over one campus. It is defined as a "growing reality" with a considerable research commitment (Rector's speech, included in UPO Academic Report 2005-2006).

Despite its recent foundation and the small number of research and teaching staff (see figure 8.11), it is organised following a traditional disciplinary-based structured like most Spanish public Universities: Experimental Sciences, Law, Business Administration, Humanities, Polytechnic School, Social Sciences, Sport - and its corresponding departments.

The internal governing structure and organisation is very similar to the Autonomous University of Madrid since they are in the same national context[144]. Therefore, the main bodies are:

- Social Council: with 26 members, including, among others, business association representatives and representatives of the municipalities and the trade union.
- University Government Board: Rector, the General Director of Human Resources and the Vice-rectorate representatives: Research and New Technologies, Academic Postgraduate affairs, Social Promotion, Services and Planning, Students, Foundations, and Institutional and International Relationships.
- Senate (*Claustro*), which includes representatives from all interest groups in the university: teachers and researchers (civil servants and non-civil servants, administrative staff and students).

It has three Foundations organised as follows:

- Knowledge and Culture Foundation, whose main aim is to promote research, culture, start-up companies jointly with external organisations and institutions.
- University-Industry Foundation, whose principal objective is to support graduate students by providing them with the necessary training to gain them access to the job market.

[144] For this reason the organisation chart is not included.

- Foundation of Municipalities: which is more oriented to the so-called third mission and is geared to developing activities which foster university-industry collaboration.

In addition, it has a Technology Transfer Office (TTO) which, to some extent, overlaps the main task of the University-Industry Foundation since its main purpose is that of communication and knowledge transfer channel between the university and external partners.

Finally, it is worth mentioning the joint research centers: Andalusia Center for Biology and Development (CABD); Andalusia Center for Molecular Biology and regenerating Medicine (CABIMER); Political Sociology Center and the School of America, Center for Advanced Studies on Latin and Caribbean Regions. As happens in the other universities described, the existence of joint centers hinders the definition of the boundaries of the university research activity, and hence, its governing.

Recently, the UPO has developed and implemented its first Strategic Plan (2005-2010) which is to act as a reference frame to orientate the decision-making process and as an instrument to give coherence to the institution's strategic objectives.

This document presents the mission and vision of the institution through three core strategic lines (activities, persons and environment), 30 strategic objectives and 131 action plans. However, in the Strategic Plan the resources that will be assigned to each of those action plans are not specified.

The Strategic Plan is the result of a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis developed in the university in which the threats, opportunities, strengths and weakness of the institutions are highlighted in general terms.

As with the rest of universities analysed, there is not a specific Research Strategic Plan but research included as one of the main points in the general document. The main aim of the research is to "develop a basic and logical strategy to maximise research in our university". In practice, this general idea is formulated, albeit rather loosely, in only 3 objectives specifically addressing research activity:

- Objective 5: Increase the quantity and quality of the research activity in the university
- Objective 6: Foster the collaboration with other research institutions
- Objective 7: Promote the research outputs transfer

Nevertheless, an interesting aspect to highlight in the implementation process of the Strategic Plan in the UPO is that, although this process was conducted by the Rectorate, faculties and departments are now compelled to develop their own strategic plans, showing their long-term interest and objectives. As an example of the work that now is being done in the department, we can highlight the initiative being carried out by the Department of Business Administration. Led by the Head of Department, a new internal structure and organisational model (with different working commissions) and strategic objectives (mainly in terms of publications and plan career for the research and teaching staff) are being set up.

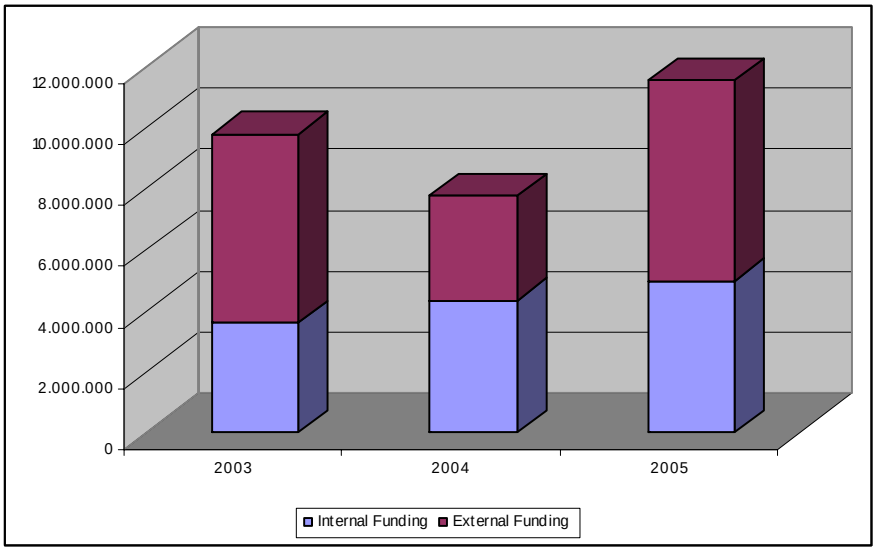
Finally, concerning the governance of research activity in this institution, there are two main novelties that require special attention: (a) the transformation of the Research Unit and (b) the approval of the second university Research Budget 2005-2009 (so-called Plan Propio), which involves an increase of 8% in relation to the first Plan (UPO Academic Report, 2005-2006).

Regarding the first point, during 2006 the organisational structure of the Research Unit was remodelled, incorporating the TTO in their internal organigram under the supervision of the Vice-Rectorate of Research and New Technologies (which will define its strategic objectives) and give them more coherent tasks. This substantial change aims to provide better administrative support to researchers given the increasing research activity in the university.

The second point, the university research budget, was defined with the idea of promoting research at three levels: grants for departments and research centers, for research groups and for individual researchers. By doing this, the Rectorate is explicitly recognising the relevance of the university research and promoting it with specific resources.

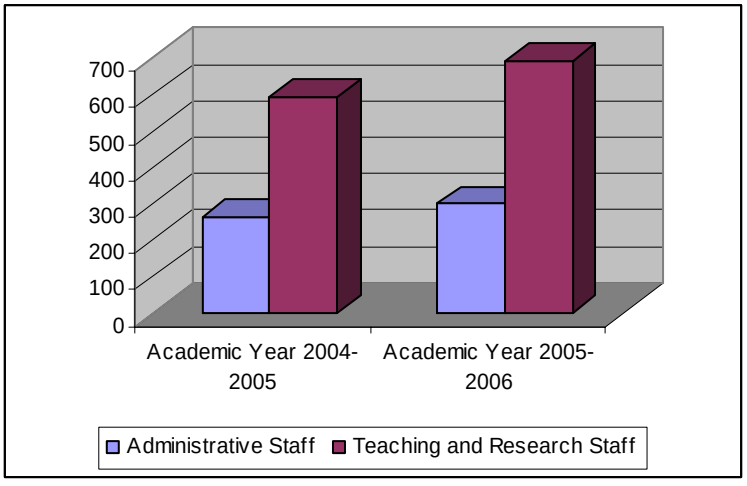
In absolute terms, the funding devoted to research activity shows an increase of approximately 15%, thanks to the Regional Government and internal contributions. As can be seen in the next figure, external funding has increased considerably.

Figure 8.10. UPO´s Funding Structures 2003-2005 (€)



Source: UPO Academic Report (2005-2006)

Figure 8.11. UPO´ Staff 2004-2006



Source: The Author, based on data available from UPO Academic Report (2005-2006)

8.2.4. Characterisation of SPRU (in Sussex University)

Above the University

Public funding for research in English higher education follows a dual system. On one hand, the Higher Education Funding Council for England (HEFCE)[145] provides block grant funding to support the research infrastructure and enable institutions to undertake ground-breaking research in keeping with their own mission (HEFCE, 2006). On the other hand, grants for specific projects and programmes are provided by the Research Councils, charities, the European Union and government departments.

This Council was established in 1992 aiming at promoting and funding high-quality and cost-effective teaching and research. It distributes public money to universities and colleges in England and provides the research infrastructure, including the salaries of permanent academic staff, premises, libraries and central computing costs. It follows a selective funding system to allocate resources taking into account the assessments of research excellence. For 2006-07, HEFCE has planned to distribute £1,342 million funding for research[146], accounting for approximately 20% of the total funding that the Council distributes for the mentioned period[147] (HEFCE, 2006; p.5).

In order to assess the excellence of the research activity, the Research Assessment Exercise (RAE) takes place every four to five years to assess the quality of research in universities and colleges in the UK. This system enables the HE funding bodies to distribute public funds for research selectively on the basis of quality, ratings range from 1 to 5* (five star). Institutions conducting the best research receive a larger proportion of the available grant so that the infrastructure for the top level of research in the UK is protected and developed. The last exercise was held in 2001 (http://www.hero.ac.uk/rae/AboutUs/).

Furthermore, the Economic and Social Research Council (ESRC) is the UK´s leading research funding and training organism in social and economic affairs. Although it is an independent agency established by Royal Charter, it receives the funds through the

[145] The web-site: www.hefce.ac.uk, provides further information.
[146] See HEFCE pp. 18-20 for detailed information about distribution of research funds under different headings.
[147] Note that more than 60% of the total funding goes to teaching.

government Office of Science and Innovation and distributes them among researchers in universities and other research institutions throughout the UK.

Within the University

The University of Sussex is a public university where teaching and research activities are considered of equal importance. The novelty of this University is that it is not organised in traditional disciplinary faculties, but in Schools.

It is a big campus with 2800 graduates and 6500 undergraduate students. It has a high international profile, with approximately 30% of the graduate students and 10% of the undergraduate students from abroad. Furthermore, one in seven Sussex undergraduates spends a year of their degree overseas (mainly continental European and North America).

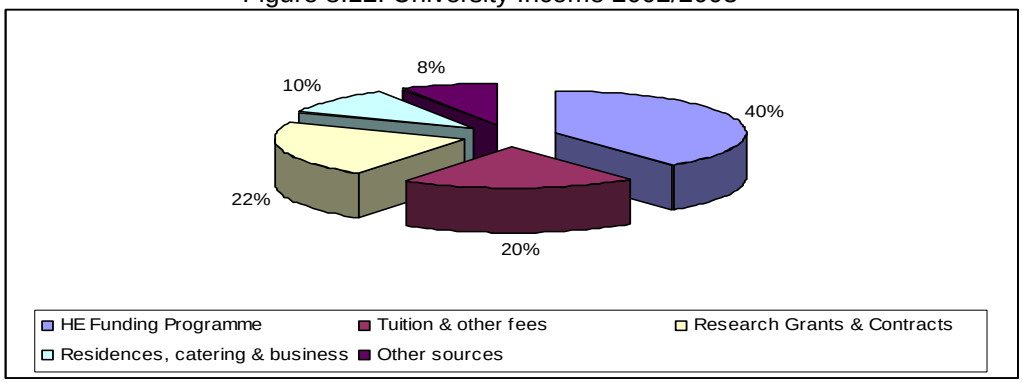
Regarding teaching activity, Sussex has more than 300 undergraduate degrees and over 180 postgraduate programmes. In addition, the university has a Center for Continuing Education, which has highly reputed part-time undergraduate and postgraduate programmes. In the academic course 2003/2004 around 2.500 students studied in this center.

Excellence and inter-disciplinarity in research is the main objective of the institution, and the 2001 national Research Assessment Exercise confirmed their leading position. Income from research grants and contracts now tops £20m and accounts for more than 20% of the total income.

Finally, referring to the third mission, Sussex University actively promotes the economic development of the Sussex region. Sussex Innovation Centre is a key resource for the region through its facilities for high-technology companies and support for business development.

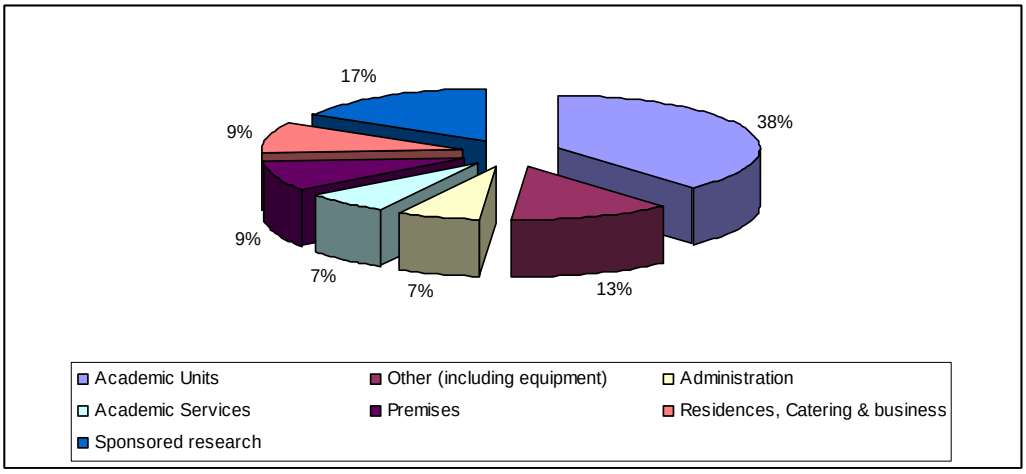
The following figures show some data on the University:

Figure 8.12. University Income 2002/2003



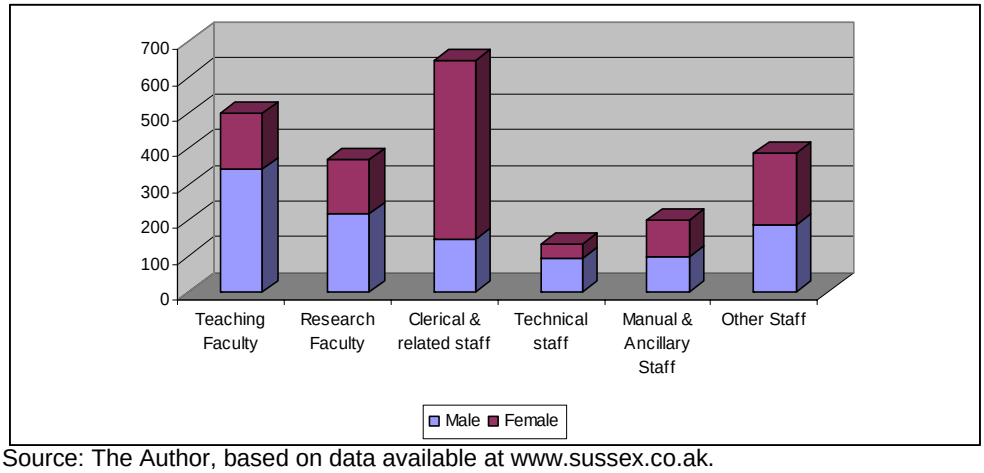
Source: The Author, based on data available at www.sussex.co.ak.

Figure 8.13. University Expenditure 2002/2003



Source: The Author, based on data available at www.sussex.co.ak.

Figure 8.14. University Staff 2002/2003



Source: The Author, based on data available at www.sussex.co.ak.

Concerning its corporate governing structure (see figure 8.15), we can distinguish three separate bodies with different functions and responsibilities in managing the University's activities:

- The Council is the real governing body of the university. It is responsible for setting the general strategic direction of the university, for ensuring proper accountability, and the management of its finance, property and investments, as well as the general business of the institution. It comprises independent, academic and student members, the majority are non-executive. The roles of the Chair and Vice-Chair of the Council are separated from the role of the University's Chief Executive and Vice-Chancellor.

  The Council holds itself responsible for steering the University, monitoring institutional effectiveness, approving major developments and receiving regular reports from the Executive Officers on the day-to-day running of its business and subsidiary companies.

  Meeting at least four times a year, the council is made up of 25 members and has 8 committees: Finance and General Purposes Committee; Audit Committee; Nominations Committee; Health, Safety and Review Committee; Constitutional Committee; and the Brighton and Sussex medical School Joint Board.

  The Chair, the Vice-Chair, and Treasurer are appointed from amongst the independent members.

- The Senate: is the University's academic authority and draws its membership entirely from the academic staff and students. Its main role is to direct and regulate the teaching and research activities in the university but besides this, it also holds discussions on any matter relating to the University, offering advice to the Council on a wide range of matters.

- The Court is a large mainly formal body and provides a public forum where members of Court can raise matters about the university. It meets once a year to receive the Annual Review and Financial Statements. In addition, it is responsible for the electing of the University's Chancellor.

Most Court members are from outside the university and represent the local community and other designated bodies with an interest in the work of the institution.

Regarding the Strategic Plan, it is interesting to note that the Office of Strategy, Planning and Governance was created in December 2006 to bring together the work of the existing Planning Office and Secretariat, within a wider role to support the development of the University's strategic and operational planning processes.

The Office works closely with the Vice-Chancellor's Executive Group on the development of the University's strategy and planning processes, and also supports the preparation and planning for the 2008 Research Assessment Exercise**.**

The University's strategic plan was published in January 2007 and builds on the "Investing in Excellence Plans" approved by Senate and Council in March 2006. During the course of 2007, the University of Sussex will be further developing its vision, mission and goals leading to a fully revised University Strategic Plan to be published in December 2007 and covering a 10 to 15 year planning horizon.

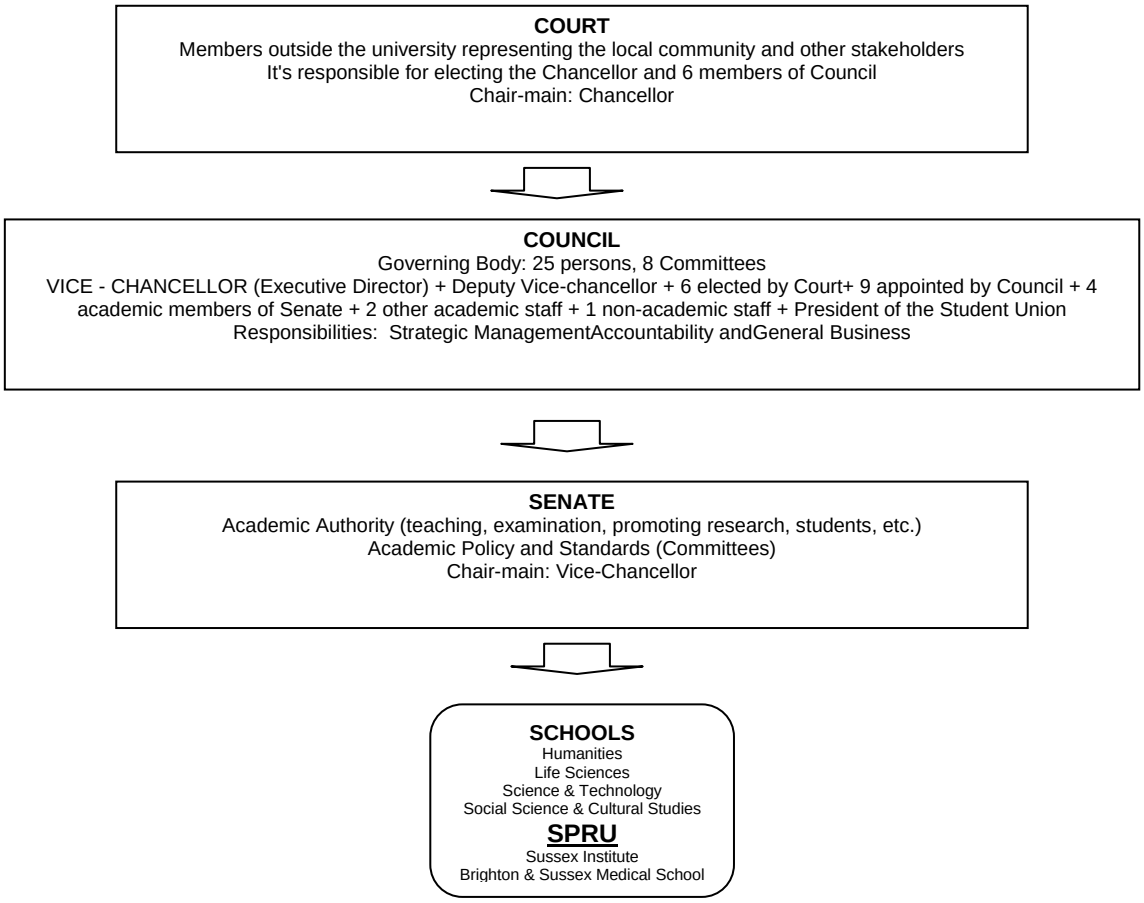
As a step towards the outcome, the *Investing in Excellence programme* has been filtered and restructured into an interim University Strategic Plan (Aims and Strategies) which was presented to Senate and Council in December 2006 and published in January 2007. It will form the basis for consultation in the university and with external stakeholders.

Finally, Sussex University has six subsidiary Companies:

- Sussex University Developments Ltd. University owned. Principally providing services to the University.
- Sussex Innovation Center Development Ltd. University owned. Property development.
- East Slope Housing Ltd. University owned. Mainly leasing residential property from the University and subletting to students.
- Dreamclean Ltd. University owned. Providing general trading services. It is dormant and there is no plan at present to activate it.
- University of Sussex Intellectual property Ltd. University owned. Exploitation of the university's intellectual property.

- Sussex Innovation Center Management Ltd. The university owns 81%. Management of the Sussex Innovation Center.

Figure 8.15. Outline of the Organisational Structure of Sussex University



Source: The Author, based on data available at www.sussex.co.ak.

With the Research Center

SPRU (Science and Technology Policy Research) is a world-famous institution in research, teaching and consultancy in the fields of science, technology and innovation policy. In its national context, SPRU has received a very high mark (5) in the last RAE (2001).

Its mission is defined as follows: “the growth, sustainability and responsible governance of science, technologies and innovation systems” (www.sussex.ak.uk/spru). Two of most outstanding characteristics of the organisation are the strong interdisciplinary profile and the high proportion of foreign students.

The main research lines are: innovation in firms and industries, science and technology systems, and governance and sustainability. In addition, it is widening and including new areas of research, such as: indicators of scientific, technical and environmental performance, management of innovation in firms, industries and countries; instruments and practices to deal with risk and uncertainties; new practices in biomedical systems, especially focused on genetics and genomics; and emerging technologies: space and satellite navigation and nanotechnology).

Although it was mainly recognised as a research institution, SPRU is now stressing the importance of teaching activity not only to masters and doctoral students but also undergraduates. Indeed, today one of the main pillars of the institution is teaching. From the organisational point of view, there is a Director of teaching to deal with student support and all the courses and programmes. In addition, a team group with academic advisors, tutors, convenors and supervisor provide support to the students. Each year between approximately 15 and 20 students join the DPhil programme and 50, the Masters programmes.

Today it has around 140 researchers from all over the world in different positions, -from research fellows to senior researchers and lecturers -, and 14 support staff.

Concerning the governing structures, today SPRU has a Director who is in change of both the academic leadership and management tasks. However, as a consequence of analysis made of external forces and its internal strengths, the institution has developed a new Strategic Plan and is immersed in an intense transformation process which is substantially changing its internal organisation structure.

In this new internal configuration, the position of Director will disappear in the near future and the governing organism will be composed of four equally important directors in charge of: Scientific Leadership, Fund Raising, Finance, and Teaching.

Although all the decisions have to be backed by the university Governing bodies, the center has autonomy to decide on its internal structure.

8.2.5. Comparative Analysis of the Four Case Studies

With the data gathered on the governing mode of the four case studies, the next table presents a comparative analysis, featuring the two main dimensions aforementioned: above and within the institutions, the latter being broken down into the following elements[148]:

- Size
- Age
- Organisational Model
- Election System of University Managers
- Leadership
- Decision-making process, taking into account both the vertical and horizontal relationships
- Communication system, also considering horizontal and vertical relations
- Research profile of the institution
- General design of job descriptions
- Existence of strategic plan as managerial tool.

Comparing the four case studies has provided us with a better understanding of each institution and made it easier to identify their similarities and differences. Moreover, this analysis has been very valuable for the development of the conceptual framework that we present in the next sub-section.

[148] Based on the analysis of organisational models developed in organisational studies. See, for example, Bueno (1997) or Mintzberg (1979).

Table 8.2. Summary of the Main Organisational Aspects of the Four Case Studies

Concepts / Institutions	Autonomus University of Madrid	Lausanne University	Pablo de Olavide University	SPRU (in Sussex University)
Above the University				
Main Institutions which influence the University behaviour	General HE and research policy at national level. Scope in HE sector: Regional level (Autonomous Communities) Accreditation agencies at national and regional level to assess researchers´ CVs Regional performance and funding agreements	General HE and research policy at federal level Regional level (Cantons) Regional performance and funding agreements	General HE and research policy at national level. Scope in HE sector: Regional level (Autonomous Communities). Existence of Accreditation agencies at national and regional level to assess researchers´ CV Regional performance and funding agreements	General HE and research policy at national level. Accreditation system: Research Assessment Exercise (at institutional level through to the researcher's CVs HEFCE: block grant funding Research Council: specific programmes and projects
Within the University				
Size	Medium	Medium	Small	Medium University / Medium-large research center
Age	Modern, funded at the end of the 60s	Ancient, funded in 14th century	Contemporary, funded at the end of last decade	Modern, funded in the 60s.
Organisational Model	Collegiate Model Vice-rectorate of Research with centralised control of research Research Service: supporting researchers from administrative point of view; dealing with competitive projects TTO: for non-competitive projects. Under the supervision of the UAM Foundation Disciplinary-based, organised by faculties	Collegiate Model with formal committees for different affairs: one specially dedicated to research. Research Commission TTO: joint unit with the University Hospitals of Lausanne. Mission: to promote the transfer of the institutions' technologies to the marketplace by licensing its patented inventions. Disciplinary-based, organised by faculties	Collegiate Model Vice-rectorate of Research with centralised control of research Research Unit: supporting researchers from administrative point of view; dealing with competitive projects TTO: for non-competitive projects under the Vice-rectorate of Research Disciplinary-based, organised by faculties	At centralised level: collegiate model. At research center level: Functional Model in four Areas: financial, fund raising, scientific director and teaching. At centralised level: organised by Schools At research center level: Interdisciplinary-based according to research main lines. Project-based.

Concepts / Institutions	Autonomus University of Madrid	Lausanne University	Pablo de Olavide University	SPRU (in Sussex University)
Election System of University Managers	Democratic election of Rector from among the academic community. Governing Team nominated by the Rector Similar system at Faculty and Department Level	Democratic election of Rector from among the academic community. Governing Team nominated by the Rector Similar system at Faculty and Department Level	Democratic election of Rector from among the academic community. Governing Team nominated by the Rector Similar system at Faculty and Department Level	At University Level: Democratic election of the Vice-Chancellor among the academic community Governing Team at centralised level selected by the former Director of the institution At Research Center level: Team nominated by the former Director (with the support of the University at centralised level)
Leadership	Intellectual Leadership Non professional,	Intellectual Leadership Non professional,	Intellectual Leadership. Non professional,	Mainly Intellectual Leadership but Managerial skills taken into account
Making-Decision Process	Strict hierarchy with formal processes for research administrative affairs Research decisions: mostly decentralised Main decision-makers: Research Group Leaders or Head of Research Institutes	Formal Research: mostly decentralised Main decision-makers: Research Group Leaders or Head of Research Institutes	Strict hierarchy with formal processes for research administrative affairs Research decisions: mostly decentralised Main decision-makers: Research Group Leaders or Head of Research Institutes	Horizontal organisational model characterised by informal relations Priorities on research clearly defined Main decision-makers: Research Group Leaders
Communication System	Horizontal: Informal	Horizontal: Informal	Horizontal: Informal	Horizontal: Informal
	Vertical: Mainly Formal	Vertical: Mainly Formal	Vertical: Mainly Formal	Vertical: combination of formal an very informal
Research Profile	Generalist and universal institution[149]. No research priorities defined	Generalist and universal institution. No research priorities defined	Generalist and universal institution. No research priorities defined	Very specialised institution, clear priority lines

[149] *Generalists* in the sense that the institution "is transversal covering the whole spectrum of disciplines" and *Universal* "because they cover the whole spectrum of training activities and thus the range of diplomas" (Laredo, 2007; p.9).

Concepts / Institutions	Autonomus University of Madrid	Lausanne University	Pablo de Olavide University	SPRU (in Sussex University)
Design of Labour Positions	Very formal: the departments requests new positions but they need university approval at centralised level The creation of new position is defined regarding teaching necessities Recruitment based on researchers´ CV (teaching and research merits): normalised process Accreditation of researchers is required but no concrete research profile is demanded	Creation of new position regarding teaching and research necessities Formally obliged by contract to devote 30% of the time to research	Very formal: the departments request new positions but they need university approval at centralised level The creation of new position is defined regarding teaching necessities Recruitment based on researchers´ CV (teaching and research merits): normalised process Accreditation of researchers is required but no concrete research profile is demanded	Based on researchers´ CV Certain flexibility to create new positions and to negotiate salaries Many positions linked to research projects
Managerial tools: Existence of Strategic Plan	Strategic Plan (SP) 2003-2006 General Guidelines Research included as a dimension of the general SP. No research priority lines defined No measurable objectives No budget assigned Led by the Rectorate Team, participatory and open design process	Strategic Vision: includes strategic choices of the institution Research included in the general document	Strategic Plan 2005-2010: General Guidelines No research priority lines defined Measurable objectives and action plans included, but no budget assigned Designing a balance scorecard for internal management Led by the Rectorate Team, participatory and open design process Strategic Plan at Faculty and Department Level is being developed. At Faculty level research is not included. At Department level career development of the junior teachers is being discussed considering research a crucial aspect. No research actions are taken	Internal Strategic Plan and University Strategic Plan General Vision of the institutions: internal organisation Led by the Director of the Institutions, general agreement has been sought from among the academic community

Source: The Author

As we can see in this synopsis, all of HE institutions analysed are characterised by collegiate organisational models where the Rectors or Vice-chancellors are democratically elected from among the academic community mostly on account of their intellectual leadership. It is then their responsibility to select the members of the governing team. Only the research center (SPRU) has a management team designated by the former director of the institution. This management team differentiates between scientific leadership and managerial tasks.

Not surprisingly, the three continental universities are organised in faculties reproducing the disciplinary `mode 1´ of knowledge production. Only the English university is organised around Schools with a more multi-disciplinary approach. Indeed, the research center has a notably trans-disciplinary internal structure. This traditional configuration of universities is closely related to the definition, or not, of a research profile. In fact, the universities under study are characterised by a generalist profile with great importance given to the teaching programmes at both undergraduate and postgraduate level. Except for SPRU, which was founded as a research center and has clearly defined the main research lines, the other universities have no institutionally defined research profile

Another interesting point is the human resource policy for designing the positions. In the three universities most positions are created to cover teaching needs in accordance with the programmes and number of students. Despite this situation, the research CV of the candidates is taken into account. However, an important difference is that while research time in Spanish universities is freely decided by the teachers-researchers, in the Swiss system it is legally designated in the contract.

Finally, the four organisations under study are now designing and implementing Strategic Plans as a managerial tool to define the university's vision and long-term strategic objectives. However, these plans are designed for the institution as a whole and research is included as one dimension.

Although the European HE sector is characterised by a high degree of heterogeneity, organised using different national and regional structures (European Commission, 2003a) and the institutions that have been analysed were founded in different historical contexts, this comparative analysis provides insights into noticeable similarities in

terms of organisational models, management style and managerial tools than can help us to conceptualise the main aspects of university governance.

8.3. Learning from the Case Study Analysis: Conceptualising University Governance in Europe

In this sub-section our main objective is to depict the concepts and categories that the case studies analysis has made visible. As a consequence of the proliferation of GT studies and cases in recent decades, in the specialised literature we have seen a great variety of terms, definitions, names and labels that different authors use to refer to the same ideas or notions. So as to avoid any confusion we have felt it important to specify the terminology and process that have been used in this PhD research.

As mentioned in chapter 7, during the 90s the GT views of Glaser and Strauss started to diverge. While in Glaser´s (1992) methodological approach the theory has to "emerge" in the course of the research process, Strauss & Corbin (1998) follow a more structured set of analytical steps[150]. Therefore, since the method proposed by the latter authors is significantly more prescriptive than that of Glaser´s approach, by specifying the steps to be taken in the data analysis and describing the coding process, we have considered this specific research methodology particularly appropriate for apprentices or beginners. It is because of this that the PhD Thesis is based on Strauss & Corbin's ideas and views[151].

Although the aforementioned authors suggest an analytical process, it should be noted that it is only a guideline containing general recommendations and ideas to help GT users with examples and other researchers' experiences (Strauss & Corbin, 1997). Consequently, flexibility[152] and creativity are indispensable characteristics of this research method, and it is itself a learning process (Strauss & Corbin, 1998).

Accordingly, to analyse the data gathered in the fieldwork (interviews, field observations, notes, internal documents and reports) we have applied the **coding process** coined in GT as "micro-analysis", which is a thorough and systematic

[150] To see further discussion on the different views of Glaser and Strauss, see Douglas, D. (2003) and Seldén (2005).
[151] To see other research applying Strauss and Corbin's approach, see Goddard (2004). See Douglas (2006) for GT research applying Glaser´s view.
[152] GT has been even adapted by some authors. See, for instance, Lings and Lundell (2005).

technique of data analysis to label variables consisting of analysing the information paragraph by paragraph and even line by line. This coding paradigm was originally articulated by Strauss (1987) and further redefined by Strauss and Corbin (1998). The aim of coding is to arrive at categories that contribute towards theoretical development (Douglas, 2003).

By applying micro-analysis and systematically comparing and codifying the incidents obtained in the four cases studies studied of this PhD research, a set of concepts and categories have been "discovered", revealing the main aspects that explain the phenomenon: Governing research activity in HE institutions. These categories integrate the conceptual framework.

Although, as stated by Strauss & Corbin (1998), coding is a dynamic and flowing process, in order to easily present and explain it, the authors recommend breaking it down into three phases or parts: open coding, axial coding and selective coding.

The **"*open coding*"** is the first analytical step aiming at labelling concepts. As the authors defined, **concepts** are the basic units of analysis, the preliminary variables that "emerge" from the micro-analysis.

In a first analysis and comparison, different concepts *a priori* disconnected have appeared, but after a deeper analysis, common characteristics and interconnections have emerged. In this way, given the large number of preliminary concepts obtained (a total of 41 concepts), we have classified them in ten "**families**" taking into account common properties and characteristics. The table 8.3 presents the families and the concepts: the numbers "1" to "10" represent the family of concepts and the letters "a" to "j" represent the concept.

Table 8.3. Concepts and "Family" of Concepts

1.	**Organisational model**
	a. Collegiate system: democratic decisions
	b. System of election of university representatives
	c. Participation level of the academic community
	d. Trust in the governing system
	e. Egalitarianism and democratic principles
	f. Tradition and *status quo.* History and context matters
	g. Hierarchy and bureaucracy
	h. Importance of the Intellectual leadership
	i. Disciplinary-based Faculties
	j. Corporate culture
2.	**Institutional Autonomy**
	a. Accountability
	b. Indicators for reporting to governmental agencies
	c. Lack of financial resources
	d. New frames to increase the level of transparency
3.	**Human Resource Policies**
	a. Necessity of incentive and punishment schemes
	b. Recruitment process and hiring processes
	c. Meritocracy vs Nepotism
4.	**Strategic Management Perspective**
	a. Existence of Managerial tools
	b. Strategic Plans
	c. Use of indicators for management
	d. Timely and flexibility in the making decision process
	e. Managerial skills and capabilities
	f. Implementation of changes
	g. Definition of priorities in research
	h. Professionalization of university management
5.	**External Pressures**
	a. Role of the Stakeholders
	b. Increase of competitiveness in the HE sector
	c. Financial and performance agreement
	d. Research assessment process
6.	**Tension among disciplines**
	a. Knowledge transfer mechanisms
	b. Excellence criteria
	c. Resource allocation criteria
	d. Existence (or not) of research priorities

7.	**Tension between teaching and research**
	a. Distribution of time
	b. Evaluation criteria and accreditation system incongruence
8.	**Role of researchers and the emergence of "virtual labs"**
	a. Autonomy in the definition of research lines
	b. Growing importance of researchers with temporary contracts
	c. Decision-making power and capacity to attract resources of the Head of labs
9.	**Promotion of excellence and quality**
	a. Imposition of excellence criteria for external agents
	b. Same criteria for different disciplines
	c. Pervasive role of trade unions
10.	**University as public service**

Source: The Author

In the effort to create a theoretical framework and by applying the constant comparative model systematically, the concepts previously mentioned in the previous table have been grouped under other concepts at a higher abstract level: this further step in the conceptualisation receives the name of **categories.**

These categories are abstractions and represent the contents of most of the interviews using conceptual notions. In other words, although the categories are not "raw" data and exclude information from certain respondents, they have been developed by analysing and comparing all the data gathered in the four case studies, i.e., are grounded in the fieldwork. As presented in the table 8.4, seven categories have been defined.

Table 8.4. Main Categories

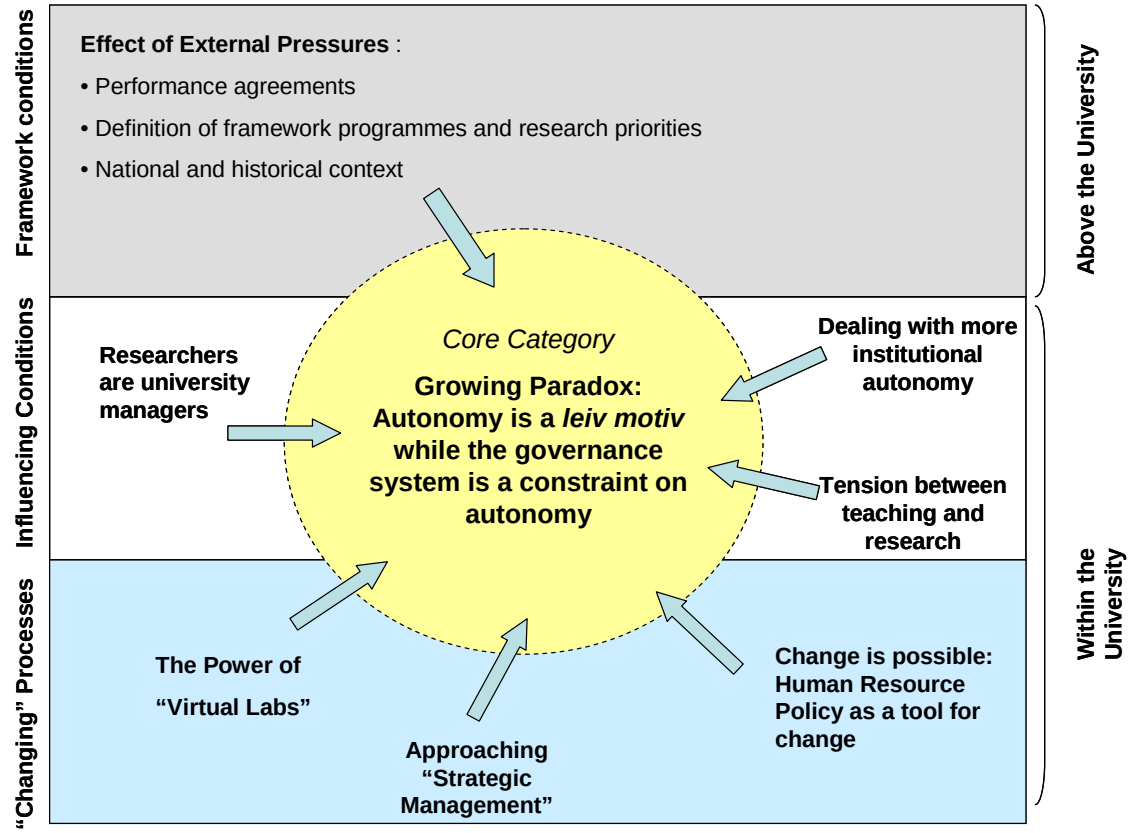
Categories
▪ Researchers are university managers
▪ Dealing with more institutional autonomy
▪ The power of "virtual labs"
▪ Approaching "strategic management"
▪ The effect of external pressures
▪ Tension between teaching and research
▪ Change is possible: human resource policy as a tool for change

Source: The Author

Once the initial open coding has been finished, the researcher identifies relationships between categories through the "***axial coding***". That is to say that the method aims at understanding the relations between the categories, which, as a consequence, will facilitate a better understanding of the phenomenon. Given that there is more than one way to express the relationships between categories; Strauss & Corbin (1998) suggest using diagrams, graphs or figures to help visualise the phenomenon. In line with their recommendations, two figures are shown below.

We agree with Strauss and Corbin (1998) in the idea that it is very important to analyse the categories in terms of the context, which we have coined a)"**framework conditions**"; b) "**influencing conditions**" that affect the phenomenon under analysis and c) the consequences or implications, which we have labelled "**changing process**". Figure 8.16 represents the main categories previously defined in relation to these three conditions and their influence on the core category (labelled in the last coding process, next page), and taking into account the **two dimensions** characterising the institutions (**above the university** and **within the university**).

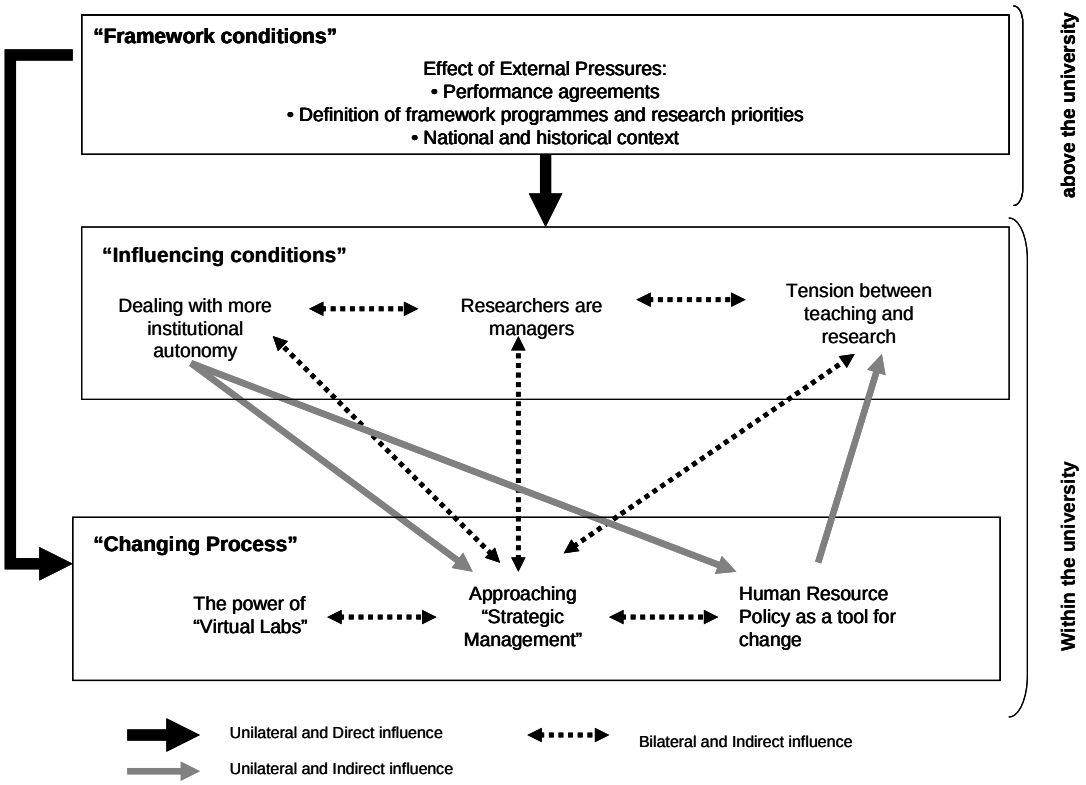
Figure 8.16. University Governance: Main and Core Categories



Source: The Author

The next diagram illustrates the complexity of the phenomenon under study, presenting how the main categories influence and affect each others. The three main squares of figure represent the main conceptual structure: framework, influencing conditions and changing process, and the arrows the direction and intensity of the interrelations. Accordingly, the black arrows present the direct and main effects: the external pressures that are above the organisation clearly affect the categories included in the influencing conditions and in the changing process. The grey arrows illustrate secondary effects between the different categories, and finally, the indirect and more secondary effects are shown by discontinuous arrows.

Figure 8.17. Relationships among the main categories



Source: The Author

Further details of these interrelations are explained in the story line that follows.

Finally, the last step in the coding process is called "***selecting coding*"** which aims at integrating all the categories and their relations into a theoretical framework: in other words, the selecting code process should result in the development of the story line. As

stated by Strauss and Corbin (1998) by doing that the **core category** appears. With this term they refer to the definition (and sometimes re-definition) of the main topic of the research. In this PhD the core category is defined as follows: "**A growing paradox: autonomy is the *leit motiv* of university governance, while the governance system is a constraint on autonomy**".

To define a category as "core category" certain points should be taken into account (Strauss, 1987):

- It should be related to the rest of the categories, to a greater or lesser degree.
- It should appear frequently in the data gathered in the fieldwork.
- It should not "force" the data.
- It is an abstract concept that can be used in other substantive areas.
- The category should explain the central theme of the research.

We have defined the core category considering these points and making it as self-explanatory as possible. In this way, it is intended to represent the generalised trend towards greater university autonomy and, at the same time, express the difficulties to implement it in the realm of practice. By using the term "*paradox*" we introduce all the tensions and puzzling questions surrounding the governing mode in these institutions and the idea of complexity.

Summing up, the coding process described, has helped us to better understand the phenomenon, the relevant categories that explain it and their relationships.

The analytical explanation (or story line of the phenomenon) is presented as follows. In order to add more strength to the ideas developed and to illustrate them better we have used *`in vivo´* code, when possible and relevant.

- ***Researchers are university managers***

All the institutions analysed are organised following **collegiate organisational models**, with collective styles of governance. These styles are based on the existence of plural decision-making committees that act as governing bodies. This organisational structure assures that all the groups in the institution are represented: teachers and researchers with different contractual positions, administrative staff and students. In addition, all the organisations have a body which includes external members from

professional associations, local government and other stakeholders. One of the most outstanding characteristics of the collective model is that the Rector or Vice-Chancellor is democratically elected by the academic community. Indeed, the candidates are academics with recognised prestige in their disciplines and an active role in the academic life. Not surprisingly, the organisational structure has similar characteristics when referring to the Government Council of the faculties (Faculty Board) and the Departments Councils. This system is intended to assure the intellectual leadership of the organisation, but has little regard for the management profile or curriculum of the persons in the election process.

This collegiate model can be defined as a democratic system of government that endeavours to assure the participation of all the academic community and avoid the concentration of power. According to the specialised literature on organisation studies, the most important reasons that justify this kind of organisational model are the following (Bueno, 1997):

- It includes a greater number of opinions and evaluations.
- It avoids an excessive concentration of power in one person.
- It articulates the representation of the groups in an institution.
- It facilitates a better coordination of the different functions and organisational units.
- It allows information to be better transmitted throughout the different levels.
- It increases motivation through participation.

Despite the mentioned benefits, the majority of interviewees perceive that this democratic model also has a negative influence on the articulation of internal policies and hinders the introduction of the changes needed to meet the new societal challenges. As clearly expressed by one respondent:

> "*The current governance structures (in universities) are unable to react quickly to the social necessities*" (COD13)

We have, in fact, noted certain reservations about the suitability of the current election system for the governing bodies in contemporary universities. The system, at all levels (Rectoral, faculty and department level), is viewed as a hindrance to the decision-making process and a restriction on the managerial capacity of the management team.

Nearly all interviewees in the institutions expressed the idea that was succinctly put by one of the interviewees:

> "*The way the university is governed is constrained by the election system of the managers*" (COD5).

Due to the fact that the election process is political, the elected university managers are academics but with management tasks and decision-making powers which normally cover a four- or five-year period, after which they return to their previous positions as researchers and teachers.

> "*The governing body tries to maintain the equilibrium of power*" (COD5).

Summing up, although the election model assures representation, democracy and participation of all university groups, it is what fundamentally hinders the decision-making process and the implementation of changes.

> Clearly, "*the management team cannot act because it is bound by the votes that are received and by particular interests*" (COD14).

Furthermore, it can be said that the most outstanding shortcomings of this kind of structure are (Bueno, 1997):

- The high cost implied, since decision-making is delayed when trying to find consensus. Some interviewees are concerned about excessive democracy in decision-making and the lack of adequate evaluation. Opinions have highlighted the advantages of alternative mechanisms: greater autonomy in the decision-making process, together with greater transparency and a rigorous ex-post evaluation.
- Possible hesitation and the lack of initiative in the top authorities, resulting in innocuous policies that do not adequately deal with the problems.
- Diluting responsibility for the decisions adopted.
- Tendency to look for unanimous solutions, which in some cases lead to minorities swaying decisions.

Even though the interviews have shown general consensus on the disadvantages of this kind of model and the need for some changes in management systems, introducing real changes in the election system and thus the composition of the governing bodies, for instance, with professional managers, as in public hospitals, art galleries and museums, still seems a very controversial issue among academics.

In fact, the four case studies analysed have revealed opposing points of view when discussing the potential advantages and risks that this professionalization of the top university authorities would bring to academic life and the production of knowledge. Although some respondents consider that the position of the Rector should be occupied by a professional manager ("*the key point to change things (in universities) is to have a professional team in the management*" (COD21), a greater number of interviewees think that the existing Management Director is enough. Finally, some interviewees support a middle stance and consider the figures of academic Rector democratically elected as compatible with the professionalization at intermediate levels. In the words of one respondent:

> "I*t is not so important how we elect the Rector but the fact that we need intermediate managers*" (COD16).

The main reasons put forward for extreme care and even opposition to any new governing structures stem from the perceived ideas regarding the potential loss of academic freedom and external interference in academic decisions. However, based on interviewees' varying comments, it can be argued that the degree of opposition should be seen within a national context. While in Spain the idea behind these perceived risks is probably the historical context of the Spanish universities and the country in general, in the UK, this is less evident given the wider acceptance of new public management principles.

> "(…) about *Governance in British universities, this is not yet true on the continent. It is true in Canada, Australia, New Zealand and UK, because they all use the British model*" (COD32)

It is worth mentioning that, in the case of Spain, the modern university models have developed in difficult political situations spanning the transition period from dictatorship

to democracy. For this reason, 'democratic' decision-making is looked on as a fundamental characteristic of these styles of governance. The following statement sums up the Spanish concern about this topic:

> *"A More efficient system of (university) governance should be thought up without affecting the democracy*" (COD11)

Closely related to the tension between managerial and research tasks in the governing teams, another aspect that we consider extremely important, and one stressed by most interviewees, concerns the two different sets of skills required for both activities:

> "*A university has to have an academic representative to front it, but he or she should be elected taking into account his / her managerial skills*" (COD5)

However, it is still the case that in all the universities analysed the managerial positions are occupied by researchers who are without the necessary skills and managerial capabilities to do the job. The tension between management and research is evident in the universities in continental Europe and even in the UK. As mentioned by one interviewee:

> "*Despite the language (managerial language), the model is still pre Margaret Teacher, academics are still leading (HE) institutions*" (COD32).

Nevertheless, while in all the universities under study the tension is yet unresolved, the English research center is now undergoing a thorough transformation process. The Director of the center has been traditionally considered as a Dean of a School or a Faculty, i.e. he or she is responsible for meeting the university's objectives as well as dealing with teaching needs and research excellence. This is to say that the intellectual leader of the institution is the top manager as well.

Recently, the tension between the two conflicting jobs (management and research) became even more evident when the institution had to look for another Director. The initial idea had been to maintain this duality and find an intellectual leader who could embody both profiles, but this proved to be extremely hard. When a brilliant manager was found, he or she lacked the research training and curriculum that the university

wanted to run such a prestigious research center. When a prestigious intellectual leader was found, he or she lacked the managerial skills and capabilities to manage the institution.

As argued by one respondent,

> "V*ery common in universities is what I call the `messiah complex´, everybody is looking for someone who can walk on water and solve everything*" (COD32).

After considerable reflection, the solution has been to split the traditional concept of Management. This quote reflects the paradox very well:

> "The *Vice-Chancellor's heart will be in academic life and his head on business, and that is the split*" (COD32)

This institution is, therefore, immersed in a process of substantial change and in the next few months a new model will be implemented: the top Director of the center will disappear and four pillars or domains will take over: Executive Director, Scientific Director, Fund Rising Director and Teaching Director. This leadership team will run the institution with a new concept of management.

The initiative is being taken in the strong conviction:

> "*The institution with the old model will not survive*" (COD32)

- ***Dealing with more institutional autonomy***

The issue of autonomy is one of the main aspects that underpins all the interviews. It is important to remember that we are referring to the definition of institutional autonomy provided in chapter 4; i.e. a university's margin of manoeuvre when prioritising the allocation of resources and not the academic freedom of individual academics to research the topics they decide on without intervention of the State or other external organisations.

The national and regional laws in different European countries are increasing the university's autonomy. However, this should be balanced with more **accountability**. In

this sense, all the universities analysed are now reporting their activities, mainly research results, more systematically, As witnessed by the work done in these four HE institutions, the growing importance of accountability for public universities and research centers seems not only to be a consequence of their greater autonomy and government interest in increased transparency, but to be also closely related to the new financial scenario in the HE sector.

As is recognised by most interviewees, the autonomy granted to make decisions and allocate resources is greater than that which the universities actually put into practice. There are many comments on the problem of autonomy in relation to the real capacity of the governing bodies to make decisions. It would appear that, the lack of autonomy has little to do with the limits imposed by external agents but is rather the result of the current system of election of university representatives mentioned before. The following comments illustrate this idea:

> "*We have capacity but we do not execute it*" (COD16) or
> "*There is great autonomy but it is not used, nobody wants to create conflict*" (COD6)

Another explanation which sheds light on the real margin of manoeuvre universities have, is related to the financial resources at their disposal. Given the scarce resources that universities have to freely allocate to research, interviewees holding managerial positions affirm that there is little real autonomy:

> "The autonomy that we use is constrained by the funds that we can manage freely" (COD27)

- ***Approaching "strategic management"***

The management of research activity has been widely recognised as a key element in the current and future success of universities. However, and in line with the previous comments, all the respondents have highlighted the importance of having resources to manage. As explicitly acknowledged by one respondent:

> "*The main line of management is resources*" (COD32)

The fieldwork has shown that there is a general tendency to use management tools (mainly developed in the private sector) in universities and research centres in order to improve their internal management and transparency. As in private companies, universities seem to be aware that defining priorities and strategic objectives is paramount in order to map out where an institution is going.

Despite the lack of managerial skills resulting from the organisational model previously described (in which academics are at the same time managers of the institution), the concept of strategic management has been taken up by the European HE sector and all the institutions analysed are now designing or implementing **Strategic Plans** as the main tool for establishing priorities and managing research activity and the institution as a whole. Nevertheless, it should be noted that in the case of Spanish universities, they have been obliged to prepare their Strategic Plan in order to benefit from the new financial agreement that the Regional governments are putting into place.

However, as a consequence of all the problems highlighted with the governing structures in HE institutions, there is little confidence in the current governing bodies making any internal radical changes or implementing real strategic plans. The following statements give us a clear idea:

> "*The Strategic Plan maintains the status quo, it does not change anything, it reflects what we have*" (COD19)
> "*Nobody believes in these things*" (COD10)
> "*There is little confidence in the idea that things can be done better*" (COD11)

The respondents highlighted two main shortcomings in the strategic plans being designed and implemented: the identification (or not) of research priorities and the establishment (or not) of specific and measurable objectives.
Regarding the first point, there is general consensus among the interviewees on the idea that Strategic Research Plans do not establish priority research lines but general objectives such as: strengthening excellence in research, improving evaluation by the national or regional agencies, increasing researcher mobility and promoting multidisciplinary research. These objectives are somehow applied through projects and actions. However, the Plans, based on principles and qualitative in nature, are considered, in general terms, to be very generic.

However, is it the responsibility of the institutions to define priority research lines or fields? Defining these lines is at the same time an important and controversial issue.

On the one hand, there are opinions defending the necessity for priority lines, since resources are scarce and universities now need to define a specific research profile. Indeed, some respondents consider that:

> "*This is not a strategic plan in itself*" (COD15).

On the other hand, others consider that universities should not define priority lines, but support excellence in researchers and research groups by providing resources and infrastructure. According to the latter opinion, the cited priority lines are indirectly defined by the national and international research plans, which are funding most research (see next point). Therefore, the researchers and research groups are really responsible for university specialisation and the university, itself, should not influence in the definition of priority lines (except for its participation in preparing the aforementioned national and international plans through the Rectors Commissions).

Although there are no explicit priority lines in any strategic plan analysed, it has been acknowledged that there are implicit lines, which result in concrete actions, such as better infrastructure, the creation of research institutes, etc.

Referring to the second point, although the Strategic Plans count on strategic areas and their corresponding objectives, the general opinion is that most of the objectives are not measurable. It has been admitted that specifying particular objectives would help management, but it would also imply firm political commitment. In accordance with this idea, it has been agreed that a system of indicators would be very useful to describe the real situation regarding research in the university and subsequently to design suitable internal policies. For example, it was suggested that it would be useful to publish every department's research budget in order to analyse their comparative position. Indeed, some institutions are, as in the case of the UPO, now dealing with strategic management at department level and developing balance score cards for better management.

Finally, all the interviewees stated that the strategic plan is proving to be a very important way to reflect on the university's orientation, mission and objectives while being highly valued as a learning process. The next statement illustrates the general view on this point:

> "(The strategic plan) *as a tool is very interesting, used to reflect on the institution, its future and the way to achieve it*" (COD20)

Another really important point is that, despite the efforts to articulate research strategic plans, in practice, governing research activity both at centralised or faculty level is primarily focused on providing administrative and bureaucratic support to researchers. In the opinion of some respondents we cannot talk about a research management itself.

Furthermore, the Deans of faculties and their teams, in most cases, have no time to deal with research, they concentrate on teaching, and the universities limit their research governing activity to administrative and operative affairs. At department level, the role of the Head of Areas is limited to promoting and fostering, in general terms, research among the teachers and professors. One of the universities analysed, Pablo de Olavide, is now in the process of developing department strategic plans including research activity as one of the main issues. However, the indicators that they have included to measure and monitor it are mainly based on publications in journals with high impact and the Doctoral Thesis that should be finished in the near future, in accordance with the objectives fixed by the Regional Government. However, no instruments to actively promote research are included.

- ***The growing power of "virtual labs"***

In practice, research is handled by **individual researchers** and mainly by what we call "**virtual labs**" and the director of the research groups. In fact, during the fieldwork some research groups have been identified as an important driving force to introduce changes since they attract their own funding and act as virtual labs alongside the university governing bodies.

Although these groups are not in the organigram and not visible enough, some interviewees hold that the reputation of the university is mainly maintained by the

efforts of individual researchers and research groups, who get research projects, attract funding and develop innovations.

It has been acknowledged by the interviewees at all levels and positions that the funds universities and research centers can devote to research projects is very small, a greater proportion of the resources comes from competitive projects at regional, national or European level. As put by one respondent:

> "*Research in the university is funded through projects that the researchers get while the university uses its own funds for ancillary issues*" (COD21)

Summing up, when talking about research governance it can be said that universities and politicians often forget the important role that researchers play and their potential to introduce substantial change in the HE scenario. This comment from one respondent summarises the idea:

> "The outstanding researchers that obtain their own resources (thorough research projects) can be an important lever to promote changes" (COD13)

- ***Tension between research and teaching***

Although, as already mentioned, our main focus is research activity, the interrelations between teaching and research in most HE institutions is so strong that it is usually very difficult to separate the implications of certain policies or organisational decisions on research and teaching.

As stated, in all the Strategic Plans analysed, teaching and research are given the same weight in these universities and even in research centers, teaching activity is growing in importance.

However, the crucial difference is that in the research center, teaching is a core activity in very specific fields closely related to the research profile of the institution and the recruitment process is based on research curriculum. There are notable tensions between these two activities in the universities and most interviewees have stressed two main elements that are increasing this tension:

On one hand, the recruitment process and the creation of new posts in universities is mainly based on teaching needs and little attention is paid to the research profile of the candidates. This situation is causing serious imbalances between the teaching duties and research interests of the teachers.

On the other hand, the distribution of time between teaching and research is based on individual considerations and the university has no way of controlling this allocation of time. When asking about "researchers" some respondents said:

> "*Who are the researchers here? I only know who the teachers are*" (COD23)
> "*How much time does each teacher devote to research? We do not have any internal parameter*s" (COD24)

Summing up, the duality between teaching and research creates an additional pressure on researchers working in universities that might potentially affect both the quality of teaching and research.

In addition, the accreditation agencies and the evaluation systems are putting much more emphasis on the research results than on teaching activity. Indeed, the criteria for researchers working in universities and in research centers are the same, regardless of the teaching hours.

This tension is even more evident in certain disciplines. Although it is argued in the specialised literature that we are now in a Knowledge-based society with a new mode of knowledge production (Mode 2 described by Gibbons et al., 1994) and that multidisciplinarity and networks are essential features of this new paradigm, the case studies have revealed that most universities are organised following disciplinary lines and that tension among them exits. These tensions are translated mainly in terms of assessment criteria since the same, or very similar ones are used to evaluate experimental sciences, social sciences and humanities. Given the differences among disciplines (as diverse as music, palaeontology, economics or chemistry), some respondents are requesting different evaluation systems that can discriminate among them and their knowledge transfer systems.

This is in line with the recent report published by the European Commission (2005c) in which these tensions are highlighted. Taking one step forward, given the nature of these tensions and the potential implications for the creation of knowledge, some authors are signalling the need to reinforce the institutional framework (Cañibano, 2006).

- ***Human Resource policy as an instrument for change***

Despite the aforementioned tensions, the human resource policy in universities has been widely acknowledged as crucial within university research policy since human capital is one of the research activity inputs, together with funding. Moreover, human capital is capable of bringing in additional funds, both public and private. One respondent pointed out:

> "*It is essential to better integrate the research policy with human resource policy*" (COD13)

Regarding the definition of Human Resources policy, many interviewees highlight the urgent need to design incentive schemes (and penalisations, if it is the case), in order to recognise excelent research. While, some 10 years ago, universities were not really able to implement these kinds of mechanisms, the current legal framework allows for greater autonomy in the design of their own initiatives to encourage research.

Particularly in the case of the Spanish universities analysed, there is a perception of real autonomy regarding personnel allocation but that it is not being exercised. The next statement illustrates this:

> (Talking about the Human Resources policy affected by the new law) "T*he expressed target was to stabilize people but what we are actually doing is to stable people*" (COD16)

Finally, a very general impression is that universities have human resource polices that help neither meritocracy nor excellence. The application of the same rules for all research and teaching staff, which is backed by the trade unions, is negatively affecting

the motivation for excellence in researchers. Several interviewees agree that the policy coined “coffee for everyone” (“the same for all”) is not helping to promote excellence.

Following on from this, in the particular case of the Spanish universities analysed, trade unions are widely perceived as a brake on the development of real university autonomy and decision-making capacity at both centralised and at faculty levels. The egalitarianism principles that trade unions defend make the creation of incentive schemes very difficult to set up, since designing internal policies of incentives would imply differenciating salaries (for instance through bonuses) and steering research careers. In this respect, most respondents consider it urgent to introduce a kind of policy that will encourage research by creating the means to heighten awareness of excellence and, at the same time, curb the influence of the trade unions when excellence is being promoted.

- ***External Stakeholders: performance agreements and external pressures***

Lastly, the need to identify the main external stakeholders in the university is shown to be very important for defining the governance of research activity and which directly affects the degree of institutional autonomy. Although the importance of relations with the business sector is recognised by the majority of the respondents, in practice it can be said that the stakeholders that really affect the university activity and orientation are the regional and national governments, the accreditation agencies and the European Union (through the definition of research priorities in the Framework Programmes). They affect two important issues at the same time: they act as funding agencies and set research priorities.

In accordance with this idea, the four institutions analysed within three different national contexts, perceive the new performance agreements with regional and national governments (for instance, the aforementioned “Programa Marco” for Andalusia and Madrid Communities and the Research Assessment Exercise for British universities established by the HE Research Council) as a constraint on research management. This is because of the definition of priority research lines and financial resources that the university or research center will receive regarding their research outputs. The following codes *in vivo* illustrate this perception:

"*The research objectives of the institution are being targeted to some extent by the Research Assessment Exercise, since we can say that the structural funds that the institution receives depend on this evaluation*" (COD29)

"*The national and European research plans already set those lines (research lines); the people adapt to those lines where there is funding*" (COD13)

Referring to other external pressures, of which competitiveness in the HE sector is one, specialised literature considers it as one of the driving forces for change in universities, but surprisingly academics and university managers do not perceive it so strongly according to the data gathered from the fieldwork. The process of globalisation in the HE sector, the virtual education models, the decrease in student numbers, the creation of new universities and other kinds of HE education structures (such as the corporate universities mentioned in chapter 4) leading to an increase in competitiveness, do not seem to be perceived as processes which directly affect daily academic activity. Universities still consider that they will endure and survive.

Interestingly, only the research center under study has shown explicit awareness of the increase in competition and the need to adapt and change its governing structure in order to maintain its excellence level and leading position in the international environment.

Summarising all the categories explained above, it can be said that in the universities analysed, governing structures are still based on a collegiate system, with a strong disciplinary basis where academics are the institutional managers having been selected almost entirely for their intellectual skills rather than their managerial capabilities. Assuring democratic decisions and keeping academic autonomy have emerged as the main reasons for this. In this context, the election system for university representatives is considered an important constraint on governance and the decision-making process. Despite the critics and acknowledgment of the limitations of the system for contemporary universities, radical changes in governing modes and structures are still very controversial. National contexts, tradition in the organisational structures and the fear of losing power in academic decisions are the main reasons argued. At this juncture, it cannot be said that there is any generalised or open debate on the professionalization of university management bodies.

It is also thought that the election system interferes with the putting into practice of the autonomy that universities now have as a consequence of the national HE sector reform. Making decisions on issues concerning resources allocation can be quite controversial when the managers are at the same time the researchers affected by the decisions.

Research activity is considered a key priority in universities, its faculties and departments, in all the institutions analysed. All the interviewees have clearly stated the growing importance of this activity for the future growth and sustainability of their universities. However, the use of **managerial principles** and tools to govern research activity refers mainly to the design and implementation of strategic plans.

Nevertheless, external pressures, mainly the new performance and financial agreements, seem to be the main **motivation** for shifting towards a more managerial university model. It was only the research center analysed which underlined the importance of adapting its internal management model, not only to the new requirements of the environment and the increase of the international competition, but also as a way to differentiate the institution and to reach excellence. The other three universities seem to be interested in managing their research better and more carefully as a direct consequence of changes in the public funding policies.

In our opinion, this analysis of the motivation for change is significant and makes a fundamental difference to private company management principles. This is because corporate governance and management is a key element in firms for their competitive advantage and a way to differentiate themselves in the market, attract more resources and more qualified staff with expertise. Public universities are starting to move towards more managerial practices due to external pressures, particularly financial agreements.

Furthermore, since **national and European agencies and governments** are, to some extent, defining the priority research lines when setting the research programmes and the competitive projects, universities do not feel the necessity to define their own research profile.

As a consequence, the so-called "**virtual labs" and human resource policy** are seen as the driving forces for internal change. With regard to the former, although the research groups are not formally included in the organisational structure of universities,

they are in charge of developing research in practice, selecting the researchers involved and responsible for obtaining resources and managing them.

Concerning the human resource policies, the design of incentive schemes is seen as a key point to promote **excellence** as well as to help reduce the **tension among disciplines** and between research and teaching.

As recommended by Strauss & Corbin (1998), to validate the conceptual framework presented, the four case studies included in this PhD research were sent to different respondents in order to get their feedback.

8.4. The Relevance of the IC Framework in HE Institutions: Improving Internal Management and Transparency

The previous analysis has shown that there is a **need of new methods of measuring and managing** the research activity in HE institutions. To this purpose, our hypothesis is that IC framework approaches seem to be a potential answer for universities to deal not only with the new managerial needs but with the transparency requirements. This idea coincides with the approach presented in the PRIME position paper: “IC Reports answer a growing need for accountability and especially fulfil the need for the transparency and competitiveness required in the Bologna process” (Schoen et al., 2007; p.2).

As explained in chapter 2, section 2.3.5, the European Commission recommends the IC reporting in universities and research organisations as a way to improve their internal management and their transparency level (European Commission, 2006b). However, introducing new managerial tools in these complex institutions required a deeper understanding of their governing mode and their margin of manoeuvre to define a strategic approach and include new governing mechanisms. Therefore, the analysis of governance patterns and management mechanisms in European HE institutions has revealed very interesting aspects to take into account when dealing with the implementation of IC models in these organisations.

Although the HE system in Europe is described as somewhat heterogeneous and universities present a wide range of activities (Laredo, 2007), both generalist

institutions and organisations which have a highly specialised research profile are aware of the need to govern their multiple activities better. This is particularly true of research, mainly as a result of external pressures for accounting and the new performance and funding agreements.

For this reason our concern is how these organisations manage their own “mixture” - their educational schemes, research intensiveness and profile, and their third mission activities - it is a key explanatory variable of their competitive position in the HE sector now, and will be even more so in the future. In our opinion, the organisations´ management perspective will lead to differentiation. This idea is widely acknowledged in reference to private firms, whose managerial approach and tools are considered crucial to sustain their competitive advantage in the market and attract professionals. In public HE organisations, it can be expected that a good and transparent governing mode will positively affect researcher and student mobility, inter-institutional cooperation, recognition of the institution, and, in general, the excellence, attractiveness and competitiveness level of the organisation.

Furthermore, we agree with the idea that for policy makers “the introduction of management structures and managerial forms of decision-making will make it possible to provide high quality education to more people and create more relevant research output at the same or even lower cost” (Schoen et al., 2007; p.4).

To this purpose, and in order to improve the analytical framework developed by the OEU (the so-called `Strategic Matrix´, explained in chapter 6), we propose an IC Report for Universities as a comprehensive way of managing and reporting intangibles information following IC approaches: the *ICU Report*. By transforming and adapting the Strategic Matrix into the ICU Report our aim was to provide a generally-accepted model, with a standard and internationally used terminology.

It is important to highlight again that the IC framework must be regarded as having a two-fold objective (European Commission, 2006b and Marr, 2005). On one hand, to function as a management tool to help develop and allocate resources and, on the other hand, function as a communication device outside the institution to attract resources. Disclosure is the next natural step after the management.

To sum up, this Report suggests the following three sections: a) the vision of the institution (strategic objectives, strategic capabilities and key intangible resources), presenting the institution's main objectives and strategy and the key drivers (or critical intangibles) to reach these objectives; b) summary of intangible resources and activities. This part focuses on the intangible resources the institution can mobilize and the different activities undertaken to increase the value of those resources. The goal is to highlight the knowledge resources that need to be strengthened and to list the initiatives that have been taken, are ongoing or planned to improve these resources; and finally, c) a system of indicators, to allow the members of the university and external parties to see what the University is like. The system is organised following the general taxonomy of IC in three subcategories: Human, Organisational and Relational Capital (MERITUM, 2002).

In our opinion, this process depicts the logical **movement from the identification of the elements that are linked to the organisation's value creation and internal strategy, to the measurement and management** of the critical intangibles that have been identified **and the disclosure** of a battery of indicators. 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.

The ICU measurement framework is thus a first approach in the design of a tool for the measurement of research activities. We consider that measurement is the first and unavoidable step towards an efficient management.

It is important to note that the indicators included in the ICU Report have been selected from the OEU Strategic Matrix, which was conceived for the management of research.

As explained in chapter 7, in relation to the applicability of the IC framework in HE institutions, the empirical work of this PhD Thesis has dealt with two main goals: the **analysis of the usefulness for management purposes** and the **willingness to disclose the indicators** proposed in the ICU Report.

This list of indicators was basically selected taking into account the availability of the information at the Autonomous University of Madrid and has been checked wit the other three institutions regarding their usefulness for management and the possible barriers for their disclosure. The complete availability of the information has not been possible to check with the other three institutions. On the contrary usefulness for management and absence of confidentially issues has been fully checked. It should be also mentioned that when developing their own indicators the institutions should check that they fulfil the criteria: Useful, Relevant (Significant, Understandable and Timely), Comparable, Reliable (Objective, Truthful, and Verifiable), and Feasible (MERITUM, 2000).

On this point, the **perceived usefulness** of the indicators was so high that no indicator was rejected at this stage. It was a very positive exercise in general since it clearly shows the acknowledged importance of this kind of information: interviewees appear to be aware that IC information is playing an even larger part in managing the research activity comprehensively.

The general **willingness to disclose IC information** shows that the interviewees are aware of the need for transparency required by the European Union, and that they no longer party to the traditional opacity in universities regarding funding distribution. Moreover, there is interest in the university taking on measurable objectives which subsequently shows a commitment to society. In other words, agreeing on the disclosure of a list of indicators means that the university is willing to accept the commitment to transparency and accounting, which is a very positive signal.

Hence, we can argue that the most important benefits of using the ICU Report are the following:

(a) ***Improving Internal Management*:**

From the management point of view[153], our concern is that despite the limitations of the current style of governance that characterises European universities – collegiate models - they still have "significant margins of manoeuvre to develop their own paths in the future" (Schoen et al., 2007; p.6).

It is expected that by implementing IC approaches, HE institutions will obtain the following benefits:

- **Defining and updating the mission statements** of HE institutions and helping to identify priorities in terms of research and teaching activities, and when possible, defining the organisation's profile more clearly.

  Interestingly, the empirical analysis has revealed the crucial importance of governing research activity but the lack of managerial instruments. There is a strong perception in the four case studies analysed of the need to include instruments and indicators for managing research activity in the long run and from a broader and more comprehensive perspective. It would therefore appear that universities are aware of the need for a managerial tool which could present all the information homogeneously and incorporate a dynamic perspective.

  However, at the same time, the analysis has shown how difficult it is to define research priorities because some academics stress the idea that the main research topics are indirectly defined by the national and European programmes. In their turn, they are the main funding agencies, and, in practical terms, the management of research activities is highly decentralised as it is the "virtual labs" which are responsible for managing their own projects and researchers.

  In this latter scenario, the ICU Report can help to identify the strengths and weaknesses of the research activity in each institution and define actions to reinforce or sustain it that can be decided and implement for the particular institution (for instance, investment in equipment and infrastructure, creation of new research posts, promotion of emerging groups with younger researchers, or

153 See Chapter 5, section 5.4.

inter-institutional collaboration frames). Therefore, when research priorities cannot be explicitly defined, the ICU Report could be a mechanism used to reflect the knowledge creation process, present the research projects or fields in which the organisation is already working, and highlight the actions to implement in order to consolidate and extend the research activity.

- Linking **strategic objectives** to long-term targets and annual budgets. 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). Nowadays as a consequence of increasing autonomy and accountability in universities and research centers and the growing importance of the performance agreements, these organisations are forced to define Mission Statements or Strategic Plans. These processes are expected to promote an internal process of learning about the institution's structure and performance, facilitate strategic discussions among the members of the organisation and discussion on the intangible value drivers and success factors, which are also objectives of the IC approaches.

- Universities should improve their **performance** and the way they manage their activities in order to differentiate themselves in a more competitive environment and attract more and better students and research and teaching staff (Shoen et al., 2007). We consider that introducing IC approaches into the governance of our HE institutions will improve internal management and hence be an important competitive advantage for the pioneer universities.

(b) ***Improving transparency*** **and** ***relationships with stakeholders***:

- The growing importance of **accountability and transparency** for the public sector in general, and for public HE institutions in particular, is pressuring them to report more information to their stakeholders which are mainly governments and accreditation agencies.

- Related to the previous point, IC approaches facilitate the **monitoring of the achievement of goals** and assess the organisation's performance over the

course of time. This issue is not only an internal priority for these organisations but has become crucially important since other external agencies and governments are supervising the academic outputs and linking public funding to research results through new performance and funding agreements.

- Last but not least, since the private firms are standardizing their reporting practices on intangibles through IC models and reports, the use of the **same language or terminology** could be a good mechanism for improving the communication between both spheres. Therefore, implementing IC Reports to diffuse information could have a positive impact on University-industry collaborations and third mission activities.

Summing up, based on this rationale, we consider that the ICU Report is a valuable instrument to deal with the managerial and transparency challenges that HE institutions have to face in the knowledge-based economy. Furthermore, the implementation of the ICU Report tool throughout universities would facilitate benchmarking and best practices analysis.

Despite the benefits of the ICU framework in terms of internal management and in the diffusion of information to society, we acknowledge some shortcomings that will be explained in the final chapter of the PhD Dissertation and will lead to further studies.

8.5. Conclusions

As stated in the research questions presented in the introduction of this PhD Thesis, our main concern when starting this PhD research was to study the potential and possible application of IC approaches in HE institutions. However, once we started to analyse these organisation we realised that understanding their governance mechanisms had to be the first step since they are characterised by their complexity, diversity and heterogeneity (European Commission, 2003a).

Surprisingly, even in the new classification of HE institutions recently developed by Vught et al. (2005), no component or element related to internal management or governing structure is included in their typology. We consider that the way organisations are managed is a key point to define their position and differentiate them.

Accordingly, our claim is that the IC framework could be valuable tool to cope with the new managerial and transparency requirements of the new HE scenario

To this purpose, and in order to answer the next research question: What are the main aspects that define the governing mode of European universities?, the main concerns about research governance in HE institutions have been analysed with the GT logic. The comparative analysis of the four case studies undertaken has made the main variables defining the university governance patterns visible. By applying the systematic procedure of data collection and analysis, seven categories have emerged to characterise research governance, and a core category was found out: “A growing paradox: autonomy is the *leiv motiv* of university governance, while the governing system is a constraint on autonomy”.

Given the diversity of HE institutions across Europe, this methodology seems to be suitable for comparing governing patterns and could be useful for policy recommendations.

After analysing these governing patterns and management mechanisms of European HE institutions, we have highlighted the most important aspects to take into account when dealing with the implementation of IC models in these organisations. On one hand, the fieldwork has revealed a great need for better governance of their multiple activities, and research in particular. On the other hand, differentiating institutions, and particularly their academic production, is seen as a strategic option to face the challenges of the rapidly changing HE sector (Schoen et al., 2007).

Hence, we propose an IC Report specially designed for these institutions: the ICU Report. Although, as highlighted, the ultimate goal of identifying and measuring IC is to improve internal management, the IC Report for disclosure IC information seems to be the logical step after the IC management processes.

The indicators proposed have been selected from the OEU Strategic Matrix, mainly taking into account the UAM as pilot case study, and have been tested in the other three institutions regarding two aspects: their usefulness for management and the potential barriers for disclosure. Note that no indicator has been rejected at this stage. On the contrary, all of them have been considered useful or very useful and the whole sample did not pose any confidentiality problem. The results obtained during the

fieldwork have also contributed to respond to the research questions: Are IC approaches useful in understanding and improving the internal management process within universities? Is the IC framework relevant in HE institutions?

9. FINAL DISCUSSION, CONCLUSIONS AND WAYS FORWARD

Today, HE institutions are considered critical institutional actors in the national innovation systems and are in the forefront of the European policy agenda. In particular, the Lisbon Agenda (March, 2000) calls for their specific involvement in the creation of the *Europe of Knowledge* and the so-called "Bologna process" is introducing structural transformations towards the homogenisation of the European HE sector. Furthermore, new financial and social pressures have led to a number of significant changes, and at the heart of the discussion are: new methods for measuring university performance and efficiency, the creation of accreditation agencies at national and regional level, the institutionalization of new funding mechanisms, reforms of national legislations to increase the level of university autonomy, and the introduction of managerial tools to improve their internal management.

Aware of the historical moment that the European HE sector is living, in presenting this PhD Thesis, our aim has been **two-fold**. On one hand, we have explored the **current governance issues in HE institutions**, mainly related to research activities, and, on the other hand, we have shown the **rationale for implementing the IC framework in these organisations** as a valuable tool to deal with the new managerial and transparency requirements.

After the theoretical and empirical analysis developed in the previous chapters, in this final chapter, we have tried to review the research objectives and answer the research

questions defined at the beginning of the research process. Accordingly, the main remarks on the theoretical analysis and the discussion on the methodology and the empirical results are presented. Finally, the main shortcomings and weaknesses identified which call for further studies are highlighted.

9.1. Final Remarks on the Theoretical Analysis

In the **first part of this PhD Thesis** the **relevance of intangibles in the knowledge based economy** has been discussed. It can be said that intangibles and IC are, today, a major issue not only for academics but also for governments, regulators, enterprises, investors and other stakeholders both in the private and public sector. Accordingly, in Chapter 2, we have reviewed the different theoretical frameworks from economics and organisational studies that have recognised the importance of intangibles elements in economic growth, to a greater or lesser degree, since the second half of the 20th century.

Furthermore, given the lack of consensus on the definition and classification of the terms `intangible´ and `intellectual capital´, we have presented some of the most relevant definitions, taxonomies and notions that are used in this PhD research. Indeed, according to Lev´s (2000) viewpoint both concepts are considered synonyms and used indistinctly. In addition, we have focused on the need for new ways of measuring and managing at macro and micro level, highlighting the most recent and relevant policies affecting intangibles developed at national and European level. Summarising the result of the **analysis of the most notable guidelines on intangibles**, we have presented a **tentative synopsis** comparing their main objective, final users, scope, level of adaptation, implementation process and the IC taxonomy used, in order to better understand the shared and dissimilar elements. Thereafter, it could be said that there are more **converging elements** than divergences. All of them are based on **voluntary basis** and stress the importance of **linking the IC management and report with the internal strategic objectives** and vision of the organisation. Furthermore, they all highlight the **importance of making the value creation process visible over time** and include a **battery of indicators** to measure both intangible resources and activities. However, though they are all very useful and excellent guidelines, “in the long run, the convergence of the existing guidelines should be sought” (European Commission, 2006b; p.25). In accordance with this, it would

seem that further political efforts towards a shared and homogeneous policy on intangibles at European level are required.

As argued, the knowledge intensive economy is leading to important changes not only in private organisations but also in public ones. The latter have a unique role in promoting the production, use and transfer of knowledge (OECD, 2001a). However, managing the public sector is especially difficult since public outputs are particularly complex and difficult to define, inputs are not easily measurable, and, as a consequence, it is difficult to assess public sector efficiency (OECD, 2003a; p. 7).

While there is a widespread trend in private companies for managing their knowledge and IC, there is little evidence that these changes are taking place in the **public organisations** (OECD, 2001a). Because IC approaches have emerged at firm-level, mainly as a way to understand the gap between the company value on their balance sheets and on the stock market (Lev, 2000), they were initially understood as having no role to fulfil in the public sector as public organisations have no market value and their products and services, no price. However, given its high degree of "**intangibility**", it is asserted that IC can be a valuable tool to improve internal management and increase the level of transparency. The growing number of experiences at macro, meso and organisational level in the public sector reinforce this hypothesis. A review of the most significant efforts and initiatives made to develop IC models in public institutions (hospitals, cultural institutions, local and regional governments, and nations and regions) has been presented. However, despite this increasing interest, we can argue that public institutions are lagging behind private institutions in this field mainly because they do not operate in a competitive environment and managers receives few incentives to innovate. Our aim has specifically been to examine the impact of IC approaches particularly in public HE institutions and research centers.

The **second part** of this Dissertation is devoted to analyse the **new frameworks and trends in HE sector**, focusing on the European level. To this purpose, the evolution of the HE sector since the last century is briefly reviewed and the main challenges of the contemporary universities are highlighted. Moreover, the new role of universities within the knowledge-based economy is studied under two different but complementary evolutionary approaches: the Mode 2 of knowledge production described by Gibbons et al. (1994) and the Triple Helix approach (Etzkowitz & Leydessdorff, 1996).

Given the new scenario, two new controversial concepts - `managerial universities´ and `entrepreneurial universities´- , and their consequences on academic knowledge, have been discussed.

From the theoretical point of view, we understand that there is no general or shared definition of these concepts in the specialised literature. We, therefore, suggest a number of features which **characterise entrepreneurial and managerial universities** (see boxes 9.1 and 9.2). With this analysis we have tried to answer two of the questions initially formulated at the beginning of the research inquiry: **What do we understand by managerial and entrepreneurial universities? Do both concepts overlap?**

Box 9.1. Characteristics of Managerial Universities

- **High degree of institutional autonomy** to manage financial and organisational affairs. Mainly referring to the university's margin of manoeuvre to allocate resources according to their priorities
- **Professional management** to govern universities. In line with managerial ideas, university internal governance should be run by a group of professionals (internal or external) with the required managerial skills.
- The introduction of **managerial mechanisms** to govern the university's internal affairs. Efficiency and effectiveness criteria, accountability, development of strategic plans, top total quality management, and teaching and research auditing procedures have become crucial elements to govern these institutions.
- **Human resource policy**. Accordingly, the use of performance-linked rewards (in the form of financial incentives, bonuses and promotions), enables universities to attract qualified human resources.
- Understanding the importance of the university's external links and their role in regional development, according to managerial ideas, **external stakeholders** should become part of the university governance body, and have more active involvement in the decision-making process.

Box 9.2 Characteristics of Entrepreneurial Universities

- Institutionalization of an internal and distinctive **economic and financial policy**. An entrepreneurial university should develop a specific internal policy to attract new private funds and resources at all levels (Rectorate, faculties, departments, research groups and individual researchers) to complement government funds. This would enable it to draw closer to the market and society as a whole in order to get recourses from business, donations, philanthropy, etc.

- **Commercialisation of research results**. Our claim is that commercialising research results is the core of entrepreneurial spirit. This means explicitly that research activity seeks profit. The most common mechanisms for its commercialisation are usually: patents, licences, copyrights, and spin-off companies.

- Development of specialised organisational structure within the university to **manage knowledge and technology transfer activities**.

- Governance of the institution following new **managerial ideas**. Our concern is that becoming an entrepreneurial university requires radical changes in the traditional governing modes in order to satisfactorily manage the organisation in a business-like way. Along the same lines, Rappert & Webster (1997) argued that to manage and reward academic entrepreneurialism, new regimes of governance within the university are needed.

It is important to note that, although being an entrepreneurial university implies including new governing *modus operandi* and following the new managerialism approach, **being a managerial university does not imply being an entrepreneurial organisation**.

The four case studies analysed in the **fieldwork have made a move towards managerialism, although they are at different stages** due to their national context and strategic approach. However, according to the aforementioned characteristics none of the institutions analysed can be defined as managerial.

Especially important for this PhD Thesis are these new ideas about managerialism. As previously explained, with this approach, the need to introduce management tools, practices and mechanisms traditionally used by firms into public HE organisations is stressed.

Accordingly, in chapter 5 we have examined the **rationale of implementing IC approaches in HE and research organisations and analysed the most**

outstanding initiatives and their implications for university governing structures and transparency. Special attention has been paid to the Austrian case, where universities have been obliged to report on their IC by publishing IC Reports since the beginning of 2007.

By doing this, we have reflected on the **potential benefits** and **implementation problems** of IC models in HE sector (see Boxes 9.3 and 9.4), and also on the recent debate “voluntary approach versus mandatory basis”.

It is important to note that adopting management systems from the sphere of private companies to public universities is not easy given their traditional approaches. For instance, although the aim of the implementation of the ICR is to improve internal management and provide more detailed information to stakeholders, some universities can limit their commitment to publishing a set of indicators without really learning about their knowledge creation value and or having a definition for strategic priorities. Indeed, there is a high risk of using the ICR only as a mechanism for funding allocation, which may have happened in the Austrian case. Defining a mission statement and strategic objectives, the basic premise for any profit-making organisation, is still a novelty for many universities. So even though it is not a direct goal of the IC approaches to encourage universities to define their strategies, the process of implementing ICRs forces HE institutions to go one step back and start identifying their mission, vision, and key processes. Otherwise, the final result could be a set of meaningless indicators which do not provide comprehensive information about the institution.

Box 9.3. Benefits of Applying IC Approaches in HE Institutions: Some Lessons

As a Management Tool

- Defines and updates the mission statements of the HE institution.
- Helps to identify priorities in terms of research and teaching activities, clearly defining the organisation's profile.
- Communicates strategy throughout the organisation.
- Allows the alignment of individual goals within institutional objectives.
- Links strategic objectives to long-term targets and annual budgets
- Promotes an internal process of learning about the institution's structure and performance.
- Facilitates strategic discussions among the members of the organisation.
- Enables the discussion on the intangible value drivers and success factors.
- Monitors the achievement of goals and assesses the organisation's performance over the course of time.

As a Disclosure Tool

- Improves the level of transparency
- It provides comprehensive and valuable information to stakeholders: students, professors and researchers, Ministries, funding organisations, enterprises, and society as a whole. In the case of the Austrian reform, the ICR is explicitly recognised as a communication tool between universities and the Federal Ministry.
- It can enhance competitiveness.
- It can facilitate the presentation of results, which could contribute to attracting funds to the detriment of other lower-performing competitors. However, note that if the university is deteriorating, disclosure may prejudice the chances of getting future grants.

Box 9.4 Potential Problems in the Implementation of IC

- The **diversity and heterogeneity of fields**, areas of knowledge, disciplines, even within the same University, which makes it difficult to have one ICR for the whole institution. The aggregation of indicators at the organisational level is problematic if the organisational units are heterogeneous, and could lead to a pointless report unable to draw a real picture of the institution.
- Contrast between classical or traditional **university culture** and innovative universities could lead to a senseless benchmark analysis.
- Although there is a general trend within HE institutions to define and develop **strategic plans and mission statements**, they have not all reached the same stage of formulation.
- Use of only a **set of indicators**, missing out the descriptive elements. In our opinion, the interpretation of the indicators is crucial, and contingent on the context and aims of the organisation/unit.
- **Manipulation of data** could be a risk that should be countered by the introduction of auditing and control mechanisms (Altengurger & Scahffhauser, 2006). The performance agreement drawn up between universities and ministries or local governments is a funding allocation mechanism. Thus, it can be considered a `zero sum game´ which means that if one university gets more funds because of better performance, another will get less, which could lead to the temptation to manipulate data to get better results, and, thus, obtain more funds. In order to prevent this, **external auditing** of data is crucial to protect the system,
- In all the institutions analysed, the ICR is **published annually** following the financial year. However, in Europe, the academic year does not correspond with the financial year. Furthermore, research activity is often, if not always, long term. Both situations make it difficult for the data collection process and the presentation of information in an ICR that should be made every year.

It is not so simple to adopt a clear position regarding the debate, the one **mandatory model** versus different models based on a **voluntary approach.**

On the one hand, the **Austrian experience** shows that it is possible to create a **radical shift** within the university sector through changes in legislation. The 1993 and 2002 law reforms aimed to increase universities' institutional autonomy creating new governing bodies and introducing new management systems. Making it a legal obligation for universities to submit an ICR every year is a **crucial step in the proliferation of IC models** world-wide, not only for management purposes but also for disclosing information to stakeholders. Having homogeneous ICRs throughout the country will facilitate benchmarking analysis and comparative studies which will help the decision-making process, improve the articulation of public policies, and increase transparency in the whole HE system. In addition, university rankings could be calculated based on homogeneous criteria. Finally, the possibility of publishing additional indicators will benefit external agents, mainly funding agencies, in their decision-making processes (Leitner, 2004). However, as the trials in the University of Vienna show, the law cannot prevent problems, difficulties and conflicts of interest in the implementation process. For this reason, a cultural change in the academic community is required in order not only to accept changes in the governing structures, but also new ways of working, new assessment processes, new labour posts, and new accountability at all levels. In other words, accepting a new conceptualisation of university will require more than a top-down reform.

On the other hand, the increasing awareness of the importance of measuring, management and reporting on intangibles has led some universities and research institutions to build their own **model voluntarily**. The models analysed are a good example of the endeavours that some leading organisations are making towards better management and more transparency. Since it is a **self-imposed initiative** in these cases, it is not expected that the implementation process of the IC model will represent a problem and the institution will really learn from the process. However, the proliferation of different models with different approaches and different sets of indicators will not mitigate the problem of comparability among institutions. So that, it is crucial to understand that IC assets are context specific. Accordingly, each **institution should identify their own key intangibles** according to the contribution to the value creation process and taking into account the strategic objectives. This encourages us

to think that it would be better to build specific models for each organisation, which could only be done with voluntary initiatives.

By analysing the existing experiences we have partially answered to the research questions: **What is the rationale behind recommending universities to identify, manage and disclosure their IC?; Are IC approaches useful in understanding and improving the internal management process within universities?; What are the main benefits and shortcomings when applying them to HE institutions?** Furthermore, the empirical analyses developed in this PhD research has contributed to shedding further light on these inquiries.

9.2. Final Discussion on Methodology and Empirical Results

9.2.1. Qualitative Methodology and the Research Process

The main subject of enquiry in this Dissertation is subjective in nature because of the novelty of the topic and, consequently, the lack of 'hard data'. Accordingly, our fieldwork is based on qualitative methodology, particularly **multiple case studies analysed using the Grounded Theory (GT) approach**.

The GT logic can be defined as an inductive research methodology of analysis and data gathering that uses a set of methods systematically applied to generate theory about a substantive area (Glaser & Strauss, 1967).

However, despite the considerable impact caused by Glaser & Strauss´ first publication (1967), the authors have evolved, and even diverged, over time from the original ideas developed in the 60s. Today it is possible to distinguish two perspectives (Douglas, 2003 and Seldén, 2005): while Glaser's view (1992) holds that the theory `emerges´ in the course of the research process, Strauss & Corbin (1998) seem to be more focused on the descriptive/interpretive analysis and on the idea of constructivist theory, and follow a more structured set of analytical steps. Glaser´s approach implies that the theory is grounded in data and embedded in reality, so the researcher has to "discover" the theory. This perspective relies on the idea that there is only one reality. However, Strauss & Corbin´s perspective suggests that the theory is constructed by the

researchers. By accepting this, the researcher can use different analytical tools to help the construction of theory (Corbin & Holt, 2005).

It is, therefore, important to note that, since the method proposed by the Strauss & Corbin (1998) is significantly more prescriptive than Glaser´s suggestions, and it is closer to our understanding of creating theory, this research has been **based on Strauss and Corbin´s GT version**.

Using GT logic, our fieldwork has been based on **four case studies: Autonomous University of Madrid (Spain), Pablo de Olavide University (Spain), Lausanne University (Switzerland) and SPRU -Science and Technology Policy Research (United Kingdom)**; and it has been presented in the **third part of the Dissertation**.

As stated by Eisenhardt (1989), sampling cases is an essential aspect of the theory building approach for multiple case study analyses. In this particular PhD research, the cases have been chosen for theoretical not statistical reasons; in other words, they have been chosen in accordance with the availability of the information and their potential contribution to the overall objective of the Dissertation. Moreover, all the institutions under analysis have shown an interest in the governance of the research activity, and in recent years have been immersed in important internal transformation processes which might potentially affect their governing structures and management style.

To ensure **rigour in the analysis**, we have followed the general scheme proposed by Miles & Huberman (1994) - an **iterative process** where the data collected have shaped the final report and, simultaneously, the conclusions have affected the data gathering process -, and the **replicate model for multiple case studies** suggested by (Yin, 1994) - where each case is analysed as a complete study, and the elements, categories, and results found are used as inputs in the next case study, improving the whole process- (see figure 7.4, p. 214 for research process).

Furthermore, our case studies rely on **triangulation** of data and research techniques: **interviews, documentary analysis and observation**. The review of the archival data has provided us with rich and detailed information about the history of the institutions,

internal policies, budget figures, human resources, strategic aims, etc. Throughout the observation we have collected information on routines, activities, behaviour, etc.

However, the **data collection process** was mainly developed through face-to-face and semi-structured interviews. It was mainly developed in **two different stages**:

- During the **first phase**, carried out during the period September to October 2004, open interviews with key people at the UAM, which was the pilot case, were held in order to have a preliminary idea about the university context and problems. In this exploratory stage, seven open face-to-face interviews with academic members in different governing and administrative positions were carried out. The results were used to (a) **design the guide for the semi-structured interviews** developed in the second stage of the research, (b) **identify the key personnel in the institution**, the crucial documents and internal reports to be analysed and, last but not least to (c) **identify problems and critical issues** in the governance of research activity in the university.

The information gathered in this first phase enabled us to complete the OEU Strategic Matrix for the UAM and to highlight the main emerging methodological considerations regarding the application of this analytical framework. By doing so, we encountered some difficulties that proved crucial in improving the analytical framework and the second set of interviews. Despite the diversity that characterises the European HE institutions, this exercise showed that most of the methodological problems are similar across universities. Because of this, we consider that the difficulties and recommendations that have emerged within the process of applying the OEU Model in the pilot case study might be of value to other institutions within similar contexts.

- In the **second stage** (July 2006 to January 2007), we carried out (a) **semi-structured interviews** and (b) an **in-depth review of secondary sources of information**: internal reports, strategic plans, budget information, research and financial reports, etc., not only in the UAM but in the other three institutions. Several interviews in each institution (thirty one in total) were held with the main decision-makers and other positions that were considered strategically important due to the amount of information they receive and their decision-making capacity in order to understand the governing mode better: Rectors, Vice-rectors, Deans, Directors of

Departments and Research Groups, members of the Transfer Units, Head of Foundations, Director of Human Resources departments, and professors from different disciplines with diverse views of the university (see table 7.3 for detailed information about the interviews).

Contrary to the interviews held during the first stage of the research, these interviews followed a semi-structured protocol. The **interview template** was composed of **two parts**: the first was related to the **use and diffusion of management indicators** in the university, and the second to the **governance** of the institution. It comprised a set of closed, semi-closed, and open questions (see Annex 2 for the complete template). Accordingly, the **goals of the interviews** mainly fell into two categories in accordance with the two main objectives of the PhD research: (a) **evaluating the usefulness of a battery of indicators for management**, previously defined by the Observatory. For that, the interviewees had to evaluate each indicator using a Likert scale; and (b) **identifying the main governance issues**, moving from the analysis of particular problems to general guidelines useful for other European universities with analogous organizational structures and similar goals.

It is important to mention that the interview process was itself a **learning process** that has allowed us to improve our interview technique during the research process. Indeed, for selecting interviewees theoretical sampling logic was used again. Accordingly, the respondents were not selected arbitrarily but for their relevance to theoretical conceptualisation. In fact, additional interviews were added to the case, when the relevance of interviewing another individual became clearer during the process or following the advice of previous interviewees. Finally, when theoretical saturation was reached no more interviews were held. Reflecting on the legitimacy of these kinds of practices that may alter the study, Eisenhardt (1989) stated that since the main goal of the case study is to better understand the event under examination and to build theory and not to obtain statistical significance of the data gathered, they are even desirable. In addition, the interview template was modified during the process and some questions were reformulated in order to better capture the relevant information. In this way, we were increasingly maximising the time in the interviews and adapting better to the different kinds of respondents.

Reflecting on the use of GT and case studies, it is argued that "the use of GT in case studies indicated that it can conceptually assist in the understanding of a problem situation, can discover local empirical theory and can also assist in the articulation of lessons learned" (Hughes & Jones, 2003; p.6).

From our point of view, the logics that underpin **case study inquiry and the GT approach** are highly compatible and have several **aspects in common**: (a) both consider that from the analysis of empirical evidence the researcher can build valid theory. In this way, the final objective of both approaches is to build inductive theory; (b) both models rely on continuous comparison of data. The constant comparative model described by Glaser & Strauss (1967) and the replicate logic for multiple cases (Yin, 1994) aim to provide a systematic procedure that assures the rigour of the emergent theory. Therefore, with both logics the research process is highly iterative; (c) they start the research process with the definition of the research questions that are considered crucial to contextualize the investigation; (d) for selecting observations or cases, both propose theoretical sampling and theoretical saturation; and finally, (e) both consider the research process as highly dynamic and flexible. In both methodologies there is constant overlapping between the data collection and the analytical process.

Following Straus and Corbin's recommendations, we have followed a systematic procedure in the data collection and processes analysis to avoid subjectivity at maximum. To this purpose, in the analysis of the field notes (interviews, field observations, other field notes and internal documents and reports) we have applied the coding process coined in GT as "**micro-analysis**". This procedure is a systematic technique of data analysis to label variables consisting in analysing the information paragraph by paragraph and even line by line, aiming at getting categories that contribute towards theoretical development (Strauss, 1987; Strauss & Corbin, 1998).

By applying the micro-analysis and systematically comparing and codifying the incidents obtained in the four cases studies studied, a set of concepts and categories have been `discovered´, as the main aspects that explain the phenomenon: the governing of the research activity in HE institutions. These categories integrate the conceptual framework. By doing that, we aimed to answer the research question: **what are the main aspects that define the governing mode of European universities?**

Although coding is a dynamic and flowing process, as recommended by Strauss & Corbin (1998), we have broken it down in three phases: open coding, axial coding and selective coding in order to easily present it.

The "***open coding"*** is the first analytical step aiming at labelling concepts. As the authors defined, *"**concepts**"* are the basic units of analysis, the preliminary variables that "emerge" from the micro-analysis (Strauss & Corbin, 1998). Different concepts *a priori* disconnected have appeared, but after a deeper analysis, shared characteristics and interconnections have emerged. This has allowed us to group the large number of preliminary concepts obtained (a total number of 41 concepts), into 9 *"**families**"* with shared properties and characteristics. The *"**categories**"*, which are abstractions that represent the stories of the interviewees, emerge from the *"families"*, allowing us to select "*a core category"* which represents an issue they all have in common.

The next step is "***axial coding***" by which the researcher identifies relationships between categories, which, as a consequence, will facilitate a better understanding of the phenomenon. We agree with Strauss and Corbin (1998) in the idea that it is very important to analyse the categories in terms of the context, which we have divided into three groups, coining them: a) "framework conditions"; b) "influencing conditions" that affect the phenomenon under analysis, and the consequences or implications, which we have labelled c) "changing processes". Using OEU (2006) dimensions, the first occurs in some way "above the University", the two latter take place "within the University" (see figures 8.16, 8.17).

Finally, the "***selecting coding***" process results in the development of the story line that follows. By doing this the "core category" is revealed (Strauss & Corbin, 1998). The *"**core category**"* in our case happens to be the following: "***A growing paradox. Autonomy is the leit motiv of University governance, while the governance system is a constraint on autonomy***".

All the "concepts" found, the "families" made with them, the "categories" that emerged from the "families" and "the core category" are summarised in the next table.

Table 9.1. Families of Concepts, Categories and Core Category on University Governance

Concepts	Families of Concepts	Categories	Core Category
Collegiate system: democratic decisions	Organisational Model	A) Researcher as managers	A Growing Paradox: Autonomy is a *leiv motiv* while the governance system is a constraint on autonomy
Election systems for university representatives			
Participation level of the academic community			
Confidence in the governing system			
Egalitarianism and democracy			
Tradition and *status quo.* History and context matters			
Hierarchy and bureaucracy			
Importance of Intellectual leadership			
Disciplinary-based Faculties			
Corporate culture			
Accountability	Institutional Autonomy	B) Dealing with more Institutional Autonomy	
Indicators for reporting to governmental agencies			
Lack of financial resources			
New frameworks to increase the level of transparency			
Need for Incentive and penalization schemes	Human Resource Policies	C) Change is possible: human resource policies as a tool for change	
Recruitment and hiring processes			
Meritocracy vs Nepotism			
Existence of Managerial tools	Strategic Management Perspective	D) Approaching Strategic Management	
Strategic Plans			
Use of indicators for management			
Timeliness and flexibility in the decision- making process			
Managerial skills and capabilities			
Implementation of changes			
Definition of priorities in research			
Professionalization of management			
Role of Stakeholders	External Pressures	E) The effect of external pressures	
Increase of competitiveness			
Financial and performance agreements			
Research assessment process			
Knowledge transfer mechanisms	Tension among disciplines	F) Growing Tensions	
Excellence criteria			
Resource allocation criteria			
Existence of research priorities			
Distribution of time	Tension between teaching and research		
Evaluation criteria and accreditation system incongruence			
Autonomy in the definition of research lines	Role and importance of researchers	G) The power of "virtual labs"	
Growing importance of researchers with temporary contracts			
Decision-making power of the Head of labs and their capacity to attract resources			
Imposition of excellence criteria for external agents	Promotion of excellence and quality	F) Growing Tensions + D) Approaching Strategic Management	
Same criteria for different disciplines			
Pervasive role of trade unions			

Source: The Author

9.2.2. Discussion of the Empirical Results

As mentioned before, this PhD Thesis has been **two-fold**: to explore the **current governance issues in HE institutions** at European level, mainly related to research activities, and to demonstrate that **the IC framework could be a valuable tool to deal with the new managerial and transparency requirements** in these organisations.

First Objective: Exploring the current governance issues in HE institutions

In relation to one of the research questions concerning the governing patterns in HE institutions: **Can we identify a *European model*?,** the empirical analysis has reflected the high degree of heterogeneity among European universities. However, despite not being able to talk about a single European university governing mode, the empirical research has shown that the four institutions analysed have **significant elements in common**.

Accordingly, **what are the main categories that define the governing mode of European universities?**

Summarising the **story line** that the aforementioned categories shape, it can be said that the governing structures in the universities analysed are still based on the collegiate system, with a **strong disciplinary basis** and where **academics are the managers** of the institutions. For the most part, they are selected for their intellectual leadership and little attention is paid to their managerial capacities and skills. Assuring **democratic decisions** and protecting academic autonomy have emerged as the main reasons for this stance. However, the election system used to vote in representatives of these institutions is considered an important constraint on governance and the decision-making process, since these researchers-managers are still part of their disciplinary groups and will go back to their posts once their mandate is over. This explains why it is so difficult for them to take any radical decisions. Despite the critics and acknowledgment of the limits of this system for contemporary universities, radical changes in the governing modes and structures are still very controversial. National contexts, tradition in the organisational structures and the fear of losing power in academic decision-making are the main reasons argued. Indeed the professionalization of the university management bodies is a generalised and open debate.

It can, therefore, be said that **the election system is perceived as a constraint on putting into practice the autonomy** that universities now have as a consequence of the HE sector national reforms. Making decisions concerning the allocation of resources is rather controversial when the managers are, at the same time, the researchers affected by the decisions.

Furthermore, evolutionary economic theories matain that the linear model of innovation is unable to explain the complex processes of knowledge production which characterise the so-called knowledge-based economy. Accordingly, the mentioned 'Mode 2´ of knowledge production and the Triple Helix approach have become crucial for understanding the new role of universities and the importance of strong links between HE organisations and other institutional actors in the current economy (Mowery & Sampat, 2004). However, **we have not found empirical evidence** to totally support these approaches.

In practice, we can say that three of the four universities analysed (with the exception of the English research center -SPRU-) are organised according to a disciplinary-based structure and, to some extent, **still follow the linear conception of innovation**. They are organised in faculties, departments and units following the conventional view of disciplines characteristic of `Mode 1´ defined by Gibbons et al. (1994). This internal structure and organisation constrain the way academics work in both teaching and research, and do not facilitate cooperation among faculties and institutions. As a result, and even though some pioneer universities are trying to implement multidisciplinary studies, most degree programmes reproduce conventional disciplinary approaches. Research assessment procedures, resource allocation mechanisms and publication rules in international journals are also constrained by disciplines. For these reasons, it could be said that **transdisciplinary research is not yet a general pattern**.

Even so, **research activity is being considered a key priority** in all the institutions analysed. All the interviewees have clearly acknowledged its growing importance in the future growth and sustainability of their universities. However, the autonomy to decide on research priorities is limited because the central funds freely available for it are relatively low. Most of the funds Universities get for research are obtained by individual or research groups (virtual labs) from competitive regional, national or European programmes, or from private sources.

External pressures, mainly referring to new social demands and financial agreements with supporting institutions, seem to be the main motivation for changing to a more managerial university model. The research centre analysed was alone in explicitly stating the importance of adapting its internal management model not only to this new scenario and the increase in international competition but also as a way to differentiate

the institution and to reach excellence. The three universities, on the other hand, seem to be interested in managing their research activity better and more carefully as a direct consequence of changes in the public funding policies.

In our opinion, this analysis of the motivation behind better management is important as it highlights a fundamental difference in the principles governing public university and private company management. For firms, it is a key element in their competitive advantage, a way to differentiate themselves in the market and to attract more resources and more qualified staff with expertise. However, **public universities which are starting to move towards more managerial practices are bowing to external pressures, particularly new funding and performance agreements.**

Lastly, the so-called **"virtual labs" and human resource policies** are seen as the **driving forces** for internal change. Related to the first point, although the research groups are not formally included in the organisational structure of universities, in practice they are in charge of developing research, selecting the researchers involved, attracting resources and managing them. With regard to human resource policies, the design of incentive schemes is seen as a key point to promote excellence as well as help reduce the tension among disciplines and between research and teaching. There are, however, forces which prevent the use of such incentives, such as the election process of the management team, previously mentioned, and the egalitarian objective of the trade unions.

Finally, in relation to the question**: Is the European HE sector really immersed in a `managerial revolution´?** The four case studies are clearly moving towards managerialism, although they are at different stages depending on their national context and their strategic approach. However, as argued before, according to the aforementioned criteria, the institutions analysed cannot be defined as managerial.

Second Objective: demonstrating the relevance of IC approaches in public HE institutions

The empirical analysis has also helped us to answer the research question mentioned above: **Is the IC framework relevant in HE institutions?**

The previous analysis has shown the **need for new methods of measuring and managing** the research activity in HE institutions. When starting this PhD research, we hypothesised that IC framework approaches could to be a potential answer for universities to deal not only with the new managerial needs but with the transparency requirements.

As explained in chapter 6, a recent initiative aiming to better understand the European HE system and contribute actively towards excellence by improving university management processes, is the Observatory of European Universities (OEU). Its main objective was to provide universities and research centres with the necessary tools for the governance of research activities. Accordingly, an analytical and comprehensive framework, the denominated `Strategic Matrix´, was created as an easy instrument to characterise research activities in universities. In addition, a "Methodological Guide" (OEU, 2006), which provides guidance for the application of the Strategic Matrix within non-participant universities has been developed.

To improve the analytical framework and not only provide universities with an instrument for improving their internal management but also for disclosing information to society as a whole, we propose an **IC Report for Universities** as a comprehensive way of reporting intangibles information following IC approaches: the *ICU Report*, (see Annex 1 for the ICU Report system of indicators). By transforming and adapting the Strategic Matrix into the ICU Report our aim has been to provide a **generally-accepted model, with a standard and internationally used terminology**.

It is important to highlight that the I**C framework must be regarded as having a two-fold objective** (European Commission, 2006b and Marr, 2005). On one hand, to function as a **management tool** to help develop and allocate resources and, on the other hand, function as a **communication device** outside the institution to attract resources. Disclosure is the next natural step after the management.

Accordingly, this Report suggests the following three sections:

(a) The <u>vision of the institution</u> (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 need to

define the mission and strategic objectives. In fact, they will be the axes for the organisation of the ICU Report. This vision is, however, missing from the OEU Matrix, where the attention is very focused on the system of indicators.

(b) 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. However, neither the OEU Matrix nor the ICU Report has been able to include information on activities. This is a serious shortcoming because the indicators on resources only show what the University "is", providing a static notion, while what is really needed is to show what the University "does", thus providing a dynamic notion. The latter provides much more information about the future trends of the organisation and allows both better internal management and information to stakeholders.

(c) A system of indicators, to allow the members of the university and external parties to see what the University is like. The system is organised following the general taxonomy of IC in three subcategories: Human, Organisational and Relational Capital (MERITUM, 2002). 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. The system of indicators proposed has taken into account the close relationship between management and measurement.

In our opinion, this process depicts the **logical movement from the identification of the elements that are linked to the organisation's value creation and internal strategy, to the measurement and management of the critical intangibles that have been identified and the disclosure of a battery of indicators**. 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.

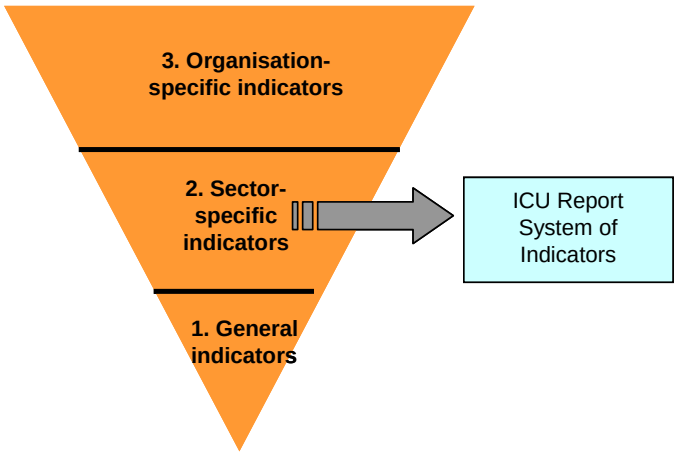
The **ICU measurement framework is thus a first approach** in the design of a tool for the measurement of research activities. We consider that measurement is the first and unavoidable step towards efficient management.

Regarding the **system of indicators**, we consider it crucial to note that both financial and non-financial indicators are included and that many of them are not self-explanatory. Consequently, the descriptive or narrative elements become crucial to contextualize and better understand the information provided by the indicators. This narrative complements the quantitative information and is essential to accurately assess the meaning of each indicator.

According to European Commission (2006b) recommendation, **standardization on the measurement of intangibles is paramount to provide comparability, interpretability and credibility of information**. However, such standardization has to be balanced with the objective of having IC Reports representing the specific characteristics of each organization.

RICARDIS proposes to, first, build a set of basic or general indicators that are useful for all organisations and institutions, second, a set of sector-specific indicators (universities and research institutions in this case), and, finally, institution-specific indicators that can be chosen by each university allowing for individual considerations. Figure 9.1 illustrates this scheme.

Figure 9.1. Standardisation of IC Indicators



Source: Adapted from European Commission, (2006b; p.111)

The ICU system of indicators is an endeavour to **set standards for clearly identifying, defining and describing indicators at sector level**. The third level of indicators should be developed by each institution individually. Assuming that every organisation is idiosyncratic in nature, the creation of a more open framework (with some homogenized 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.

It is important to note that the indicators included in the ICU Report have been selected from the OEU Strategic Matrix, which was conceived for the management of research. This list of indicators was basically selected taking into account the **availability of the information** at the Autonomous University of Madrid and has been checked with the other three institutions regarding the indicators' **usefulness for management** and the **possible barriers for their disclosure**. Note that no indicator has been rejected at this stage. On the contrary, **they have all been considered useful or very useful and none has posed any confidentiality problem**. It should also be mentioned that when developing their own indicators, institutions should check that they meet the criteria: Useful, Relevant (Significant, Understandable and Timely), Comparable, Reliable (Objective, Truthful, and Verifiable), and Feasible (MERITUM, 2000).

The general willingness to disclose IC information shows that the interviewees are aware of the need for transparency required by the European Union, and that they no longer support the traditional opacity of universities regarding funding distribution. Moreover, there is an interest in the university taking on measurable objectives and subsequently showing a commitment to society. In other words, agreeing on the disclosure of a list of indicators means that the university is willing to accept a commitment to transparency and accounting, which a very positive signal.

Summing up, **is it possible to move towards a more managerial approach in our universities to improve their performance and their competitiveness?** Our claim is that it would be possible if universities are willing to introduce new managerial approaches, and we argue that the IC framework could be especially useful to deal with the managerial and transparency demands. However, we consider that although introducing IC approaches is a necessary tool for improving their internal management

and level of transparency it is not enough. Significant transformations in the traditional university governing styles and structures seem to be required to make real the principles of institutional autonomy, external accountability and quality that the reforms across Europe (London Communication, 2007)[154] are trying to develop. As stated by the recent new Lisbon Declaration, "universities work to strengthen further their institutional research strategies with a view to introducing strategic management approaches" (EUA, 2007; p.5).

9.3. Main Shortcomings and Suggestions for Further Studies

In this Dissertation, we claim the IC framework is a valuable tool for dealing with the new managerial and transparency requirements of the new European HE scenario. Indeed, as recognised by the PRIME Position Paper, in public HE institutions the ICU Report can be expected to answer the growing need for accountability and transparency required in the Bologna process (Schoen et al., 2007).

However, despite the total acceptance of the system of indicators for managerial purposes and the perceived willingness to disclose IC information in the four institutions previously mentioned, it **is possible to identify some weaknesses**, which call for additional future research.

In table 9.2 we summarize how we have moved from the OEU exercise to the ICU Report and highlight the most serious **shortcomings** of this latter.

The **lack of activity-related indicators** is a particular limitation that should be tackled in future studies. Without them, the current ICU Report only presents a static notion of the institution. As formally defined in this PhD Thesis, activities are actions that aim 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, and accurate show what the main strategic goals of the institution are. Accordingly, we state that the scanning of indicators that provide information on intangible activities will be paramount in applying the IC framework in HE institutions in the future. The RICARDIS document also emphasises the importance of distinguishing between resources and activities.

[154] Communiqué of the Conference of European Ministers Responsible for Higher Education (2007).

Table 9.2. Process of Design of the ICU Report Framework for HE Institutions

Initial Origin of Indicators	ICU Report	Testing process	Shortcomings both in the Strategic matrix and ICU Report
OEU Strategic Matrix	Indicators Selected from the Strategic Matrix	4 Case Studies: UAM, UPO, UNIL & SPRU	1) There are no indicators on activities. ICU Report shows what the University "is" (static notion), not what the University "does" (dynamic notion).
Rationale: Those that seemed appropriate for the research groups and would answer key questions on dimensions to measure	Rationale: Those that seemed: a) Available at the UAM b) Useful for management c) Not cause disclosure problems	Results: a) Availability not fully tested (some universities had no time to provide data) b) All indicators were found useful or very useful c) No indicator was found to cause confidential problems	2) Some indicators were not clear enough and they do not cover all the governing issues identified, 3) No testing with the rest of OEU universities has been possible. A questionnaire was sent but no reply was received. 4) Information on teaching resources and activities should be incorporated. Indicators on "third mission" issues should be further developed.

Source: The Author

Despite acknowledging that the lack of activities-related indicators clearly represents a limitation to this research, we feel it is important to note that the battery of indicators was designed to improve internal management and transparency and also comparability among institutions. If we bear in mind that our aim has been to achieve comparability, it thus seems more advisable to use indicators of resources which would avoid the possible reluctance to reveal 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 away sensitive information. For this reason, the indicators on activities to be disclosed should be carefully selected.

Moreover, when going through the case studies, it was noticed that **some indicators would need a further definition** to make them useful for management purposes and

comparable among institutions. Even with a very clear definition, indicators can be misleading as they depend 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 through the process of standards setting.

In addition, it is important to mention that the set of **indicators does not cover all the governance issues** identified by applying the GT analysis. However, it should be considered useful for identifying governance styles and evaluating research results in the European HE sector. Given the complexity of the research governance topic, there is no unilateral relationship between categories and indicators. Therefore, several indicators may provide information on the same category while another may prove useful in assessing several categories.

Different examples linking the IC indicators proposed, and the categories that emerged as crucial in the governing analysis, are presented in the Table 9.3.

Table 9.3: Usefulness of Indicators to Identify and Evaluate Governing Modes: some examples

IC indicator in the ICU Report	GT Concepts, Families and Categories
Structure of Research Budget by scientific fields	Tension among disciplines
Amount of research budget managed at central level with respect to total Research Budget	Autonomy in the definition of research lines
Existence of a Strategic Plan for Research	Existence of Managerial tools
All indicators on publications All indicators on patents	Increase of competitiveness, Excellence
Share of staff appointed through formal procedure	Recruitment and hiring processes Human resource policy

Source: The Author

Hence, in future steps some indicators will need further definition in order avoid misleading interpretations, and new indicators could be proposed in order to measure all the significant issues affecting research governance, teaching and third mission issues.

It would be important to test the **availability of data for the whole set of indicators** in the four case studies selected, and enlarge the sample by including other participant institutions in the OEU. By doing this, it would be possible to link the strategic matrix and the ICU framework better, as well as checking whether the indicators selected are

feasible and well-suited to other universities. This further analysis would make the indicators more robust.

Furthermore, given the three **missions of the university** (teaching, research and third mission) and their interrelationships, incorporating information on the other two roles of the university would be necessary in future to get a comprehensive and complete picture of the whole institution.

Finally, we would like to note that for future studies a technical university should be taken into account in the case study selection. Given the distinct characteristics that defined these organisations, it would be very interesting to test the results and the IC framework in a polytechnic university.

Due to the mentioned shortcomings, this PhD research should be considered an initial attempt that will be developed in the future.

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ANNEXES

ANNEX I. ICU REPORT

ICU REPORT

Section 1. Vision of the institution.

- ✓ What main services does the organisation provide?
- ✓ What are the institution's main objectives?
- ✓ What makes a difference with respect to other institutions?
- ✓ What resources (human, organisational and relational) are necessary to reach the objectives and 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*?

Section 2. Summary of intangible resources and activities.

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

Section 3. A system of indicators for IC resources.

		HUMAN CAPITAL
		EFFICIENCY
1	F	Total funds for R&D / Number of researchers
2	NF	Number of PhD students / Number of Researchers
3	NF	Number of Researchers / Number of Administrative Personnel
		OPENNESS
4	NF	Number of visiting fellows from other universities/Number of Researchers (per field) (A. National, B. International)
5	NF	Number of PhD students coming from other universities/Total number PhD students (per field) (A. Nat., B. Internat.)
		ORGANISATIONAL CAPITAL
		AUTONOMY
6	F	Amount of resources devoted to R&D / Total Budget (personnel cost is not included)
7	F	Structure of the Research Budget by scientific fields (by disciplines)
8	F	Amount of budget constraints (personnel cost + equipment cost) / Research Budget
9	F	Amount of research budget managed at the central level / Research Budget
10	F	Lump-sum for Research (A. Governmental funding, B. Non-governmental funding) / Total Funding for Research
11	F	Share of staff appointed through autonomous formal procedure (at the University level + by type, by field and by units) (consider procedures dealing with positions and academics)
12	F	Non-core funding / A. Total budget, B. Budget for Research
13	NF	Thresholds imposed to fund-raising (including weight of tuition fees on total budget and incentives given to private donors to support research activities)
14	NF	Structure of non-core funding
		CODIFICATION OF KNOWLEDGE THROUGH PUBLICATIONS
15	NF	Number of publications by disciplines / Total publications of the university
16	NF	Number of copublications per field (6 Frascati levels) (A. National, B. International)
17	NF	Number of citations of publications by discipline / Total publications of the university
18	NF	Share of specialisation publication in a discipline compared to the total publication of the university.
19	NF	Indicators of Production for books, chapters, e-journals, etc.
20	NF	Indicators of Visibility for books, chapters, e-journals, etc.
		CODIFICATION OF KNOWLEDGE THROUGH INTELLECTUAL PROPERTY
21	NF	Number of active patents owned by the university (by field)
22	NF	Number of active patents produced by the university (by field)
23	F	Returns for the university; licences from patents, copyright, (sum & % to non public resources)
24	F	Joint IPRs by university professors and firm employees
		STRATEGIC DECISIONS
25	NF	Existence of a Strategic Plan for Research
26	NF	Existence of mechanisms to evaluate the Strategic Research Plan
	NF	- Frequency
	NF	- Brief Description of the process

		RELATIONAL CAPITAL
		SPIN OFFS
27	NF	Number of Spin-offs supported by the university
28	NF	Number of Spin-offs funded by the university and % above the total number of Spin-offs (funded + supported)
		CONTRACTS AND R&D PROJECTS
29	NF	Number of contracts with Industry (by field and by a competitive/non competitive classification)
30	NF	Number of contracts with Public Organisations (by field and by a competitive/non competitive classification)
31	F	Funds from Industry / Total budget for Research
32	F	Funds from Public Organisations / Total budget for Research
		KNOWLEDGE TRANSFER THROUGH TECHNOLOGY TRANSFER INSTITUTIONS
33	NF	Existence of a Technology Transfer Institution
34	NF	Checklist of activities of the TTI
		- Intellectual Property Management
		- Research contract activities
		- Spin-offs
		- Others
35	F	Budget of TTI / Total budget of the university
		KNOWLEDGE TRANSFER THROUGH HUMAN RESOURCES
36	NF	Number of PhD students with private support / Total PhD students
37	NF	Number of PhD students with public support / Total PhD students
		PARTICIPATION IN POLICY MAKING
38	NF	Existence of activities related to policy making
39	NF	Checklist of activities related to policy making
		- Involvement in national and international standard setting committees
		- Participation in the formulation of long-term programmes
		- Policy studies
		INVOLVEMENT IN SOCIAL AND CULTURAL LIFE
40	NF	Existence of special events serving social and cultural life of society
41	NF	Checklist of special events serving social and cultural life of society
		- Cultural activities
		- Social activities
		- Sport activities
		- Others
		PUBLIC UNDERSTANDING OF SCIENCE
42	NF	Existence of specific events to promote science
43	NF	Checklist ranging from specific events to promote science, to classical involvement of researchers in science dissemination and other forms of public understanding of science
		- Researchers in Media
		- Researchers in Forums
		- Others

F = Financial indicator - NF = Non-financial indicator

ANNEX II. INTERVIEW TEMPLATE

NAME:

POSITION:

INSTITUTION:

DATE:

PART 1: GOVERNING MODE

SECTION A: STRATEGIC PLAN

1. Does the research center have a Strategic Plan (hereafter: SP)? Is it included in the University Strategic Plan?

2. Have you participated in the development of the SP? We have considered three main parts in the Strategic Plan process: design, implementation and evaluation. Please, try to evaluate your personal participation in each phase (both formal and informal) circling the appropriate answer: high, medium, low or none.

	Your participation in the **Design** of the Strategic Plan			
Formal	High	Medium	Low	None
Informal	High	Medium	Low	None

	Your participation in the **Implementation** of the Strategic Plan			
Formal	High	Medium	Low	None
Informal	High	Medium	Low	None

	Your participation in the **Evaluation** of the Strategic Plan			
Formal	High	Medium	Low	None
Informal	High	Medium	Low	None

3. In your opinion, who has participated in the development of the Strategic Plan? Please, rate each of the following groups of the academic community using a qualitative scale of High, Medium and Low. Again, try to differentiate among the three phases of the SP.

Key Groups in the Academic Community	Design	Implementation	Evaluation
Individual Researchers			
Head of Research Groups			
Director of the Research Center			
Administrative Staff of the research center			
Rector and Governing Board (of the University)			
Other Agents within the university……			
Other External Stakeholders…….			

4. Design of the Strategic Plan

- ⇒ Please, explain briefly the design process of the SP in your research center.
- ⇒ Does the SP define concrete and measurable objectives?

5. Implementation of the Strategic Plan

- ⇒ Please, explain briefly the implementation process of the SP in your research center.
- ⇒ Who is in charge of this process?

6. Periodic Evaluation of the Strategic Plan

- ⇒ Is the Strategic Plan under evaluation? If yes, describe briefly how the evaluation process is: mechanisms, frequency, etc.
- ⇒ Is it possible to monitor the degree of achievement of the objectives initially defined? Which are the mechanisms to correct divergences?
- ⇒ Do other external agents participate in the evaluation of the Strategic Plan?
- ⇒ Do you have any external verification of the research results? Which agency is in charge of this task? Do you know the parameters that they used to verify your academic outputs?

7. In you opinion, what kind of actions can be taken to improve the next SP?

8. In your opinion, the SP was the result of:

	Direct	Indirect	No Intervene
Overlapping individual projects and expectations			
Collective negotiation			
Decision of the top managers			
External pressures			
Others ….			

SECTION B: GOVERNANCE STYLES

9. In your opinion, which are the most pro-active groups in the governing of the research activity? Please, again rate each of the following groups of the academic community using a qualitative scale of High, Medium and Low

	Pro-active groups in the Research Activity Management
Individual Researchers	
Head of Research Groups	
Director of the Research Center	
Administrative Staff of the research center	
Rector and Governing Board (of the University)	
Other Agents within the university……	
Other External Stakeholders…….	

10. What kind of relationships do you perceive among the groups that participate in the governance of the research center? Please, circle the appropriate answer

- Formal / Informal
- Negotiation / Conflict

SECTION C: DEGREE OF DEFINITION

11. Please, give your opinion on the following statements:

	Completely Agree	Agree	Disagree	I do not know
The current SP is replicating the traditional situation and internal structure in my research center				
The current SP has identified new research fields and is promoting new approaches				
The SP has been developed following other strategic plans from other institutions at national level				
The SP has been developed following other strategic plans from other institutions at international level				
The SP has tried to show the special characteristics that define the research center				

SECCION D: CONSTRAINTS

12. What is the degree of autonomy that the research center has with regard to the definition of research priority lines? And with regard to the resource allocation process? Please, circle the appropriate answer.

	Degree of Autonomy			
Definition of Priorities	High	Medium	Low	None
Resource Allocation	High	Medium	Low	None

13. In your opinion, to what degree do external agents influence in the definition of research priorities? (For instance, the University Governing Board, the Regional Government, the European Commission, etc.).

14. In particular, how much research independence is there regarding the following issues? Please, mark each of the following. In case of constraints, please, explain briefly.

	Completely independent	Independent	Dependent	High dependent
Budget allocation				
Human resource management				
Building and maintenance of infrastructure and equipment				

SECCION E: RELATIONS WITH THE ENVIRONMENT

15. In your opinion, what is the real capacity of the research center to influence in the definition of public policies on research? Please, circle the appropriate answer.

	Capacity of the research center to influence research policies			
Regional Policies	High	Medium	Low	None
National Policies	High	Medium	Low	None
International Policies	High	Medium	Low	None
Others (for instance, sectoral policies)	High	Medium	Low	None

16. Finally, in your opinion, do you think the location of the research center is important for the success of the institution?

NAME:

POSITION:

INSTITUTION:

DATE:

PART 2: INDICATORS FOR UNIVERSITY MANAGEMENT

Thinking about the usefulness of the following indicators for management purposes in your research centre, please rate as best you can the usefulness of the following indicators using a scale of 1 to 3, with 1 being `Extremely Useful´, 2 `Quite Useful´ and 3 `Not useful´.

In addition, please answer the following question for each indicator: do you find any resistance for its diffusion? Answer the question just marking Yes or No in the following table.

F = Financial Indicator - NF = Non Financial Indicator

		HUMAN CAPITAL	**USEFULNESS FOR MANAGEMENT**			**DIFFUSION**	
			1	**2**	**3**	**YES**	**NO**
		EFFICIENCY					
1	F	Total funds for R&D / Number of researchers					
2	NF	Number of PhD students / Number of Researchers					
3	NF	Number of Researchers / Number of Administrative Personnel					
		OPENNESS					
4	NF	Number of visiting fellows from other universities/Number of Researchers (per field) (A. National, B. International)					
5	NF	Number of PhD students coming from other universities/Total number PhD students (per field) (A. Nat., B. Internat.)					
		ORGANISATIONAL CAPITAL					
		AUTONOMY					
6	F	Amount of resources devoted to R&D / Total Budget (personnel cost is not included)					
7	F	Structure of the Research Budget by scientific fields (by disciplines)					
8	F	Amount of budget constraints (personnel cost + equipment cost) / Research Budget					
9	F	Amount of research budget managed at the central level / Research Budget					
10	F	Lump-sum for Research (A. Governmental funding, B. Non-governmental funding) / Total Funding for Research					
11	F	Share of staff appointed through autonomous formal procedure (at the University level + by type, by field and by units) (consider procedures dealing with positions and academics)					
12	F	Non-core funding / A. Total budget, B. Budget for Research					
13	NF	Thresholds imposed to fund-raising (including weight of tuition fees on total budget and incentives given to private donors to support research activities)					
14	NF	Structure of non-core funding					

		ORGANISATIONAL CAPITAL	USEFULNESS FOR MANAGEMENT			DIFFUSION	
			1	2	3	YES	NO
		CODIFICATION OF KNOWLEDGE THROUGH PUBLICATIONS					
15	NF	Number of publications by disciplines / Total publications of the university					
16	NF	Number of co-publications per field (6 Frascati levels) (A. National, B. International)					
17	NF	Number of citations of publications by discipline / Total publications of the university					
18	NF	Share of specialisation publication in a discipline compared to the total publication of the university.					
19	NF	Indicators of Production for books, chapters, e-journals, etc.					
20	NF	Indicators of Visibility for books, chapters, e-journals, etc.					
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21	NF	Number of active patents owned by the university (by field)					
22	NF	Number of active patents produced by the university (by field)					
23	F	Returns for the university; licences from patents, copyright, (sum & % to non public resources)					
24	NF	Joint IPRs by university professors and firm employees					
		STRATEGIC DECISIONS					
25	NF	Existence of a Strategic Plan for Research					
26	NF	Existence of mechanisms to evaluate the Strategic Research Plan					
	NF	- Frequency					
	NF	- Brief Description of the process					
		RELATIONAL CAPITAL	**USEFULNESS FOR MANAGEMENT**			**DIFFUSION**	
			1	**2**	**3**	**YES**	**NO**
		SPIN OFFS					
27	NF	Number of Spin-offs supported by the university					
28	NF	Number of Spin-offs funded by the university and % above the total number of Spin-offs (funded + supported)					
		CONTRACTS AND R&D PROJECTS					
29	NF	Number of contracts with Industry (by field and by a competitive/non competitive classification)					
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31	F	Funds from Industry / Total budget for Research					
32	F	Funds from Public Organisations / Total budget for Research					
		KNOWLEDGE TRANSFER THROUGH TECHNOLOGY TRANSFER INSTITUTIONS					
33	NF	Existence of a Technology Transfer Institution					
34	NF	Checklist of activities of the TTI					
		- Intellectual Property Management					
		- Research contract activities					
		- Spin-offs					
		- Others					
35	F	Budget of TTI / Total budget of the university					

		RELATIONAL CAPITAL	USEFULNESS FOR MANAGEMENT			DIFFUSION	
			1	2	3	YES	NO
		KNOWLEDGE TRANSFER THROUGH HUMAN RESOURCES					
36	NF	Number of PhD students with private support / Total PhD students					
37	NF	Number of PhD students with public support / Total PhD students					
		PARTICIPATION IN POLICY MAKING					
38	NF	Existence of activities related to policy making					
39	NF	Checklist of activities related to policy making					
		- Involvement in national and international standard setting committees					
		- Participation in the formulation of long-term programmes					
		- Policy studies					
		INVOLVEMENT IN SOCIAL AND CULTURAL LIFE					
40	NF	Existence of special events serving social and cultural life of society					
41	NF	Checklist of special events serving social and cultural life of society (Cultural, Social, Sport, etc.)					
		PUBLIC UNDERSTANDING OF SCIENCE					
42	NF	Existence of specific events to promote science					
43	NF	Checklist ranging from specific events to promote science, to classical involvement of researchers into dissemination and other forms of public understanding of science					