Competitive Intelligence theoretical framework and practices: the case of Spanish universities

Montserrat Garcia-Alsina (corresponding author mgarciaals@uoc.edu)
Josep Cobarsi-Morales
Eva Ortoll

Information and Communication Sciences Department
Universitat Oberta de Catalunya
Rambla del Poblenou, 156
08018-Barcelona
Telephone number (+34) 93 326 36 94
Fax number (+34) 93 356 88 22

Abstract

Purpose. This article summarizes previous studies to develop a theoretical framework useful to describe and classify competitive intelligence practices. It is applied to study CI practices developed by Spanish universities, comparing usual practices with those developed during the process of adaptation of degrees to the European Higher Education Area, with strong challenges.

Design/methodology/approach. The research employs a mixed-methods approach (semi-structured interviews and questionnaires) developed in two phases. It has focused on the academic offer, which represents 46.35% of the degrees presented in 2009, belonging to 90.16% of Spanish universities.

Findings. The results reveal predominance of incipient and reactive practices, oriented to the tactical level. During the adaptation process, these practices evolved due to the perception of the involvement of universities in the adaptation process. In addition, the proposed theoretical

framework could be a tool to study competitive intelligence both in other university management areas and other kind of organisations.

Practical implications. This framework based on research done in business sector can be applied to any kind or organizations, including NGO and public sectors.

Originality. Management tools used in the business sector, such as *competitive intelligence (CI),* have been adopted by Higher Educations Institutions, but while competitive intelligence has been studied in depth in the business sector, it has scarcely been studied in higher education. This framework can be applied to any kind or organizations.

Keywords: competitive intelligence; economical intelligence; environmental scanning; higher education sector; strategic planning; EHEA

Article classification: Research paper

Introduction

The term *competitive intelligence* (CI) has innumerable definitions, from which we have selected one offered by Bergeron & Hiller (2002), due to its focus on information management processes: CI is the *"collection, transmission, analysis and dissemination of publicly available, ethically and legally obtained relevant information as a means of producing actionable knowledge […] for the improvement of corporate decision making and action"*.

This paper studies CI practices in the higher education sector, focused on the design of university academic offer.

This topic answers the need to study two fields: a) CI practice in sectors scarcely explored until now; b) New emerging forms of management in the higher education sector. Academics and practitioners of CI claim the need to *explore other contexts and sectors* in which CI practices are developed (Fleisher, et al., 2007; Hesford, 2008). Compared with the predominance of

studies on CI practices in the business sector, studies in the public sector or non-profit organisations are rare (Brouard et al., 2010). Higher education is one of the scarcely studied sectors, although different authors recommend CI as a management tool for universities (Cronin, 2006; Garcia-Alsina, et al., 2011; Morrison & Mecca, 1988; Ortoll et al., 2010; Rombert et al., 2007). Second, in order to optimise their resources and their involvement in the development of the region where they are located, the university sector needs to incorporate efficient forms of management (Brennan & Teichler, 2008; Jongbloed, et al., 2008). In fact, in the last 20 years, universities have progressively incorporated business management tools, as required by both the academic and governmental spheres (Commission of the European Communities, 2003; EUA, 2003; Taylor et al., 2008). Representative examples of these tools are strategic planning, the scoreboard, and quality management, which are linked to management evaluation and accountability (Álamo Vera & Garcia Soto, 2007). CI has also been progressively incorporated as a management tool in universities, because information acquisition – financial, demographic, technical and social – and its exploitation facilitate the design of multiple future scenarios for decision-making processes (Havas, 2009; Mayberry, 1991; Morrison et al., 1988; Murphy, 1987; Rombert et al., 2007; Souari & Ben Salma, 2007).

Specifically, this paper build a theoretical framework to study these practices, and then deals with the peculiarities of these practices in Spanish universities, being one of the tools used to cope with challenges such as management and optimisation of resources granted by the Government and those obtained by the university as a result of its own initiative. Recently, Spanish universities have incorporated CI as a tool to define actions and strategies in response to the changing needs of the environment and the demands of society, as well as contributing to their competitiveness (EA-2008-0152, 2009; Garcia-Alsina et al., 2011; Ortoll et al., 2010). Recent exploratory research on the adaptation of the degrees to the European Higher Education

Area (EHEA) reveals a predominance of reactive, tactical and decentralised CI practices, although with a tendency to become more systematic, and strategy oriented (Garcia-Alsina et al., 2011). These practices have been promoted by the need to obtain information about the environment in a context of pressure and uncertainty - more highly stressed than the usual everyday framework in which CI practices are involved - to fulfil the requirements to accredit the degree adaptation process to the European Higher Education Area (EHEA): degree justification, and adaptation to its environment according to *Real Decreto* (royal decree) 1393/2007 (RD 1393/2007).

Therefore, considering the aforementioned elements, the aim of this article is twofold. Firstly, we will deepen in the analysis of CI practices in Spanish universities, comparing usual practices with those specific to the adaptation process, taking into account a sample broader than that considered in previous studies (Garcia-Alsina et al., 2011). Secondly, we will identify the characteristics of the universities in comparison with organisations in other sectors, and their involvement in CI practices.

The rest of this paper will firstly present some theoretical foundations and our analysis framework founded on a literature review and secondly, a description of the methodology and methods employed. The following sections will detail the results, discussion and conclusions.

Theoretical background and analysis framework

According to previous studies, we can characterise CI practices in universities by Organisation of the function and processes of the intelligence cycle. Besides, different factors influence CI practices (Figure 1).

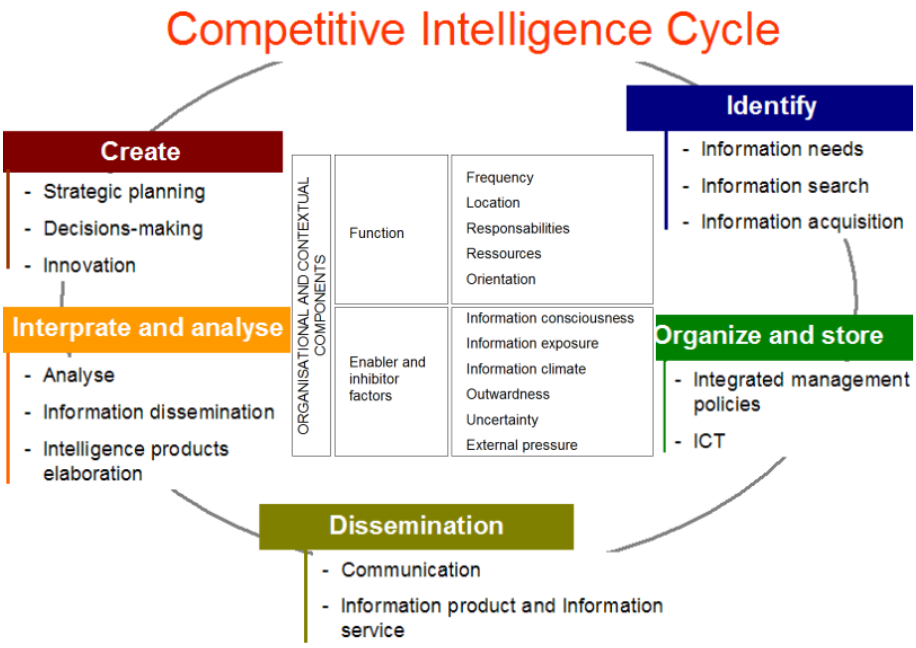

Figure 1: Facets of the CI practice

Intelligence function

Organisations can choose between different *organisational formulas for the intelligence function* (Heppes & Du Toit, 2009; McGonagle & Vella, 2003; Saayman et al., 2008; Sawka, 2001, Trim & Lee, 2008). These formulas are: *centralised*, *decentralised* and *intelligence networks*. Specifically, the *centralised* formula guarantees greater control of data, and avoids the dispersion of information. Some authors consider centralisation convenient to organisations with a *strategic orientation* (Gilad & Gilad, 1986; Sawka, 2001). The *decentralised* formula is especially adequate to apply a *tactical orientation* because it facilitates specialization in specific topics. However, when coordination of CI efforts is lacking, this formula can produce information dispersion, and creates informational islands between the units or those in charge of obtaining and managing information. Hence, this formula could have a negative influence on the efficiency of CI practices (Gilad et al., 1986; Mcgonagle et al., 2003). Finally, *intelligence networks* are conformed by employees in the organisation as well as external agents, this being a

flexible organisational formula, where social capital plays a main role (Davenport & Snyder, 2005; Levy, 2009; Nahapiet & Ghoshal, 1998). This formula has three characteristics: it is a bridge between corporate intelligence and the rest of the organisation, it creates a wide sensitivity to the environment, and it can be adapted both to *tactical* and *strategic orientation* (Ghoshal & Kim, 1986; Gilad et al., 1986; Grabowski, 1987). In this case, as in the latter, coordination of the networks is decisive to optimize efforts.

The identification of *responsibilities* translated into procedures and allocated *resources* – human and material – also influences the system in the adopted practices (Cartwright et al., 1995; Fahey et al., 1981; Heppes et al., 2009; Saayman et al., 2008).

According to the *frequency* of searches, practices are either *proactive* –foreseeing problems and detecting opportunities – or *reactive* –answering concrete information needs or solving unexpected problems or as consequence of some environment uncertainty (Cartwright, et al., 1995; Rouach &Santi, 2001).

Finally, the *orientation* – *proactive* or *reactive*, *tactical* or *strategic* – function is due to the needs of the information expressed by the organization's objectives, or by the unit where the function is allocated, or by the organisational level where the obtained intelligence applies, or by the temporary framework to foreseen the results of the designed actions (Cartwright, et al., 1995; Fahey et al., 1981; Rouibah & Ould-Ali , 2002). Organisations devoid of a strategic planning culture have a *reactive* and not very systematic orientation. Thus, they search for information to reduce short-term environment uncertainty and only to manage a specific problem. In contrast, organisations that regularly and *proactively* scan the environment according to a plan, detect threats and opportunities in time to design actions. Orientation is *tactical* when the intelligence

function is focused on operational-level managers, who make the short-term decisions. Orientation is *strategic*, when the intelligence is addressed to upper-level managers whose decisions and actions are long-term. Orientation and the needs detected determine which concrete subjects are aims of the environmental systems (market, customers, products, technology, etc.) (Culver, 2006; Fahey, et al. 1981; Ghoshal et al., 1986; Peyrot et al., 2002).

Intelligence Cycle

The framework proposed by Choo (2002, 2006) is a starting point to analyse five phases of the intelligence cycle. The first phase is *detection* that refers to identification and collection of the organization's information needs. The subjects of the information collected give insights into the orientation, systematic degree and the maturity of practices (Cartwright et al., 1995; Fahey et al., 1998; Heppes et al., 2009). In this phase three indicators emerge: a) Organizational procedures to identify information needs, and to update and/or validate the sources employed; b) Information sources employed and their relevance according to previously detected needs, and c) Channels employed to obtain information. In the second phase, *information organisation and storage,* two indicators are taken into consideration: a) Integrated procedures inside the organization to manage information, which coordinate the efforts applied in different organisational areas to manage information; and b) Technologies available in the organisation to support information management. The *dissemination* phase contributes to join the distinct pieces of information obtained in order to give sense to the collected weak signals (Hiltunen, 2010; Rouibah et al., 2002). In this phase, features considered are: a) Which channels – both formal and informal – there are to communicate and disseminate information, b) Which information products and services are created or obtained by the organisations, and c) How these channels, products and services are available to members of the organisation. In the *interpretation and analysis of the information* phase, we analyse four indicators: a) Use of the information products

and services, with added-value, b) Use of the dissemination channels for these products and services, c) Existence of spaces and structures to share, interpret and analyse information inside the organisation, and d) Analysis techniques to extract intelligence. Finally, in *the intelligence generation* phase we have considered which structures are responsible for decision-making and the model followed (Choo, 2006); and decisions and actions designed considering the intelligence generated.

Factors influencing CI Practices

Although there are no conclusive studies about which factors influence CI practices, we can consider four groups of factors (Garcia-Alsina, et al., 2013). Firstly, the *size* of an organisation influences economic and human resources allocated and consequently it influences the resource investment and the development of efficient CI programs. Hence CI is a greater challenge for small companies than for large ones (Saayman et al., 2008). Secondly, the *sector of activity* where an organisation operates and the frequency of changes in the local environment would influence the degree of information used (Ghoshal et al., 1986; Hesford, 2008; Kourteli, 2005). Thirdly, *individual factors* influence how organizations detect, disseminate, and interpret information through predisposition of employees to develop activities related to information, value given by employees to information about the environment, or exposure of organisation members to contexts rich in information by participating in professional events or in social networks (Jaworski et al., 2002; Correia & Wilson, 2001). Fourth, *organisational factors* such as infrastructures that determine access to and use of information influence CI practices: procedures, technological resources, information systems, rooms, information services, bibliographic collections, dossiers, etc. (Choo, 2002; Correia et al., 2001; Jaworski, et al., 2002). Five, *organisational culture* influences CI processes through work structures adopted by the employees, communication patterns, culture of improvement and learning, and informational

culture, that contributes to sense-making and to adapt the organisation to the environment (Choo, 2006). These components can affect the activities and the structures related to the entire cycle: a) Information sharing, b) Giving value to the intelligence extracted, c) Detecting which information should be obtained and how, d) Using and applying the information obtained for decision-making processes, e) Reacting to market changes, f) Adapting organisational processes to environmental changes (Choo, 2006). Finally, an influential factor is also the self-perception of organisations with regard to their environment, and the pressure felt to obtain information. This perception determines how these organisations organise and apply the CI process, how they analyse information about the environment and adapt the information to their environment (Daft & Weick, 1984; El Mabrouki, 2007).

Methodology

The methodological design is based on two questions: Which features characterise usual CI practices in universities, both before and during the EHEA degree adaptation process?, and What are the peculiarities of higher education in comparison to other sectors, and how do these peculiarities affect CI practices?

This research is based on mixed research methods, with predominance of qualitative techniques (Creswell & Plano Clark, 2011; Hernández et al., 2010; Teddlie & Tashakkori, 2009), and it has two sequential phases. In the first stage, we explored CI practices in universities by means of qualitative methods, with a reduced sample. In the second phase we took data extracted during the first research phase and we selected a wider sample. To design the interviews and the questionnaire, we used the indicators identified in the function, the cycle and the factors (Figure 1). Finally, we emphasize during our study we avoided employing the term CI, using terms related to the intelligence function or the intelligence cycle, or the term information management

instead.

First phase: Sample, data collection and exploratory analysis

In this phase, the universe of the study comprised the degrees that are part of the first ministerial call for accreditation (October 2007 to February 2008), regardless of the results obtained. This universe was composed of 200 degrees in 33 universities (43.5% of Spanish universities). From this universe we selected 15.5% of the degrees presented in February 2008 from 14 universities, representing 42.43% of the universities that participated in the call. This selection is based on a wide variety of casuistry that conforms the context: a) Autonomous communities, with variety in population density, territorial extension and guidelines for the adaptation process; b) Age of the university and management model (public or private); c) Background to the degrees presented; d) All the branches of knowledge.

Information was collected through observation of *documentary sources* (strategic plans, quality management systems, verification dossiers, corporative portals, national and autonomic legislation, and autonomous community guidelines); and, *open interviews* focused on a pre-established guide, adaptable depending on each interview course: 47 managers were confidentially interviewed and recorded.

Last, to analyse the content we defined a group of codes corresponding to the facets and indicators identified in the literature (Figure 1) and the content was labelled using software to assist the analysis of qualitative data.

Second phase: sample, description and data integration

The study universe was expanded to all degrees that had presented adaptation memorandum before May 2009, regardless of the evaluation result. From a total of 863 degrees that were presented for verification, pertaining to 82.43% of Spanish universities, we drew a sample of 400 degrees (46.35%). The selection criteria were: 200 degrees were all the degrees presented in the first call for accreditation, and the remaining 200 belong to the second call for accreditation. The latter were simple random sampling, with a level of confidence of 99.7% and a ±5% margin of error.

Data were collected with on line asynchronous semi-structured questionnaires, based on the contexts and data obtained in the first phase. This questionnaire was composed of open and closed questions, with predominance of the latter, addressed to deans and coordinators. For this phase we used survey software to monitor and exploit the answers. Before sending the questionnaires we identified the interlocutor, and later we followed up the answers until an answer ratio of 38.75% was reached.

Finally, we analysed the data with descriptive statistics and coded the open questions. Then we integrated the results of the frequencies and the open questions with the knowledge obtained in the first phase of the study. Thus the results presented in this article are an integration of the two phases, and are based on a sample that represents 46.35% of the degrees presented to be accredited until May 2009, pertaining to 90.16% of the universities presented in 2009 (83.53 of Spanish universities). In 2011, when the EHEA process finished, the total number of degrees in Spanish universities was 2,338, so the 863 degrees presented in 2009, which are the universe of this study, account for 36.91 % of current degrees.

Results and discussion

In this section we present intelligence practices in Spanish universities, contrasting usual practices with those specific of the adaptation period. This section has been structured in three parts: function organization, intelligence cycle, and peculiarities of the university sector.

Function organization:

The intelligence function is generally recognised and implemented in Spanish universities, although practices are discontinuous and with incipient formalization. Practices have been intensified and systematised during the adaptation process and tend to be more continuous. These results coincide with previous studies (Garcia et al, 2011).

a) Location, responsibilities and resources.

Different units collect and manage information about the environment (Social Council, Foundation University-Enterprise, Occupational Observatory, Labour exchange or orientation service, Quality Unit, Board of Trustees, or Library). Formalization is still incipient because of the diffused responsibilities, scarcity of procedures and integrated policies of information management, and lack of coordination between units. It influences optimisation of resources allocated to these tasks, creates informational islands, duplicity and divergence of data as a problem for decision-making as occurs in other sectors (Heppes et al., 2009; Sawka, 2001).

The *organisational level* that is in charge of the intelligence function is predominantly the quality unit, directly reporting to the vice-chancellor or vice-dean. Due to the culture of procedures implemented by the quality function, the allocation of the intelligence function in the quality unit could have positive implications for CI practices in universities, such as having devoted resources and having implementing some systems in the CI activities. The existence of formalised procedures constitutes one of the enabling factors of CI practices (Choo, 2002;

Correia & Wilson, 2001).

About the *responsibilities* to scan the environment, these are formally or informally delegated to specific teams, placed in different departments or in units. In addition, these university members are connected to external stakeholders from whom they also obtain information. This organisational formula is similar to the intelligence networks proposed by some authors (Choo, 2002; Trim et al., 2008). Therefore, there are intelligence networks formed by internal and external agents (professors, associated professors, employers, or public administrations). These networks should be connected with other units that also collect information from the environment in order to optimise efforts, according to recommendations made in previous studies about other sectors (Ghoshal et al., 1986; Grabowski, 1987; Jaworski et al., 2002).

Usually, there is scarcity of dedicated *resources* to CI. Regarding *human resources*, interviewees mention the need for a professional profile to manage information. This issue influences the time employed in decision making, which is greater to search for information than to analyse it. Before these common practices, during the adaptation process there is intensification of the intelligence function, more systematic, and greater contribution of human and material resources. Nevertheless, regardless of their size and the management model (public or private), CI systems are different between universities, depending both on the perception of pressure that each university felt from their environment, and the vision that each university had of the adaptation process –either as an opportunity for improvement or an administrative formality –. Apart from an information management unit or units, the centres in general have adopted different formulas to capture and manage environmental information, depending on environment's perception, coinciding with previous studies (Daft & Weick, 1984; EA-2008-0152, 2009; El Mabrouki Nabil , 2007).

b) Frequency

In universities, information is usually searched on an irregular basis, either for specific needs or as reaction to a problem that has arisen (Figure 2). Meetings with stakeholders or professional networks are also irregular. Therefore, with regard to frequency, the intelligence function is reactive, although it has some interest for carrying out proactive practices, scheduling information searches.

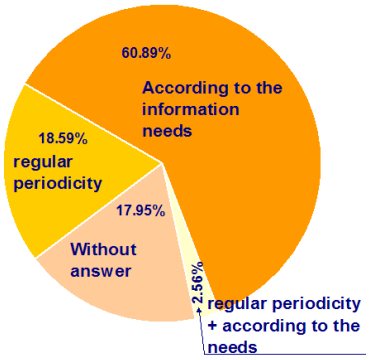

Figure 2: Frequency of environment scanning

During the adaptation process – characterised by some pressure and uncertainty – the search frequency in some centres increases, depending on the perception of the adaptation process. Since the adaption process started, a high percentage of universities search for information systematically (51.92%). In this sense, universities follow patterns already identified in literature about CI practices in the business sector: organisations increase their CI practices in the face of greater pressure from the environment (Bergeron et al., 2002; Rouach et al., 2001).

c) Orientation

The intelligence function is predominantly oriented to tactics and it is reactive, both in usual practices and during the adaptation process. Nevertheless, during the adaptation process we have identified increasing strategic orientation.

This *tactical orientation* can be deduced from de usual information needs confronted to those specific of the adaptation process and degree aims, and the organisational level where intelligence is applied. Both before and during the adaptation process, the predominant subjects are tactically linked to the market (competition and demands of the environment) (tables 1 and 2). Tactical orientation is motivated, among other causes, by process regulations, but also by the perception of the adaptation process (opportunity or administrative formality). The opportunity is perceived both from the *market* point of view and from the *organisational* point of view. In addition, perception of opportunity, or competition and more commercial features has influenced the design of innovative degrees, and the development of actions to scan the environment. Hence, in spite of the tactical predominance, it is expressed strategic orientation (table 3).

SUBJECTS - USUAL INFORMATION NEEDS	TOTAL (%)
Regulations, specifications and recommendations of ANECA	98.72
Universities training offer	96.15
Insertion in the labour market of the university graduated students	95.51
Demand of graduates and profiles searched in the work offers	94.87
Legislation	93.59
Prospective future needs of the labour market	91.67
Evolution of the number of students enrolled in the own university	91,67
Degrees demanded by the population that wants to study in the university	87.18
Key features of students practices	85.26
Detection of possible alliances with other faculties or departments	83.97
How to attract students	82.69
Those indicated in the Quality System	80.77
Evolution of enrolments in other universities considered direct competition	80.13
Detection of changes in society	80.13
Detection of changes in technology	75.64
Those indicated in the University Strategic Plan	73.72
Detection of changes in politics	68.59
Detection of changes in the economy	68.59
Other subjects	24.36
I have not looked for information	8.97

Tactical subjects
Strategic subjects

Table 1: Orientation of the function according to its usual information needs

NEEDS TO DRAW UP THE MEMORANDUM	TOTAL (%)
Indicators of graduation, drop out and efficiency	95.51
Referents of the degree	92.31
Evolution of the number of enrolled	91.67
Labour insertion	90.38
Legislation	90.38
Competitions	89.10
Opinion of students about which features of the degree they would improve	77.56

Companies and institutions collaborators in the design of practices	71.79
How employers see graduates from the faculty /department	66.67
Operation level of the current practices in the old degree	57.05
DUE TO LACK OF TIME, we have not looked for information, although we would like to	0.64
We have not needed more information. What we had at the University was enough	0.64
Others	0.00

Tactical subjects
Proactivity / Passivity

Table 2: Orientation according to topics of the information searches during the adaptation process

OBJECTIVES	TOTAL (%)
Quality of the degree	91.67
Adapt the degree to the methodology and to the requirements of the accreditation process	87.18
Improving existing degrees in the university	75.64
Aligning the degree to the strategy and environment needs	69.23
Being a referent in its influence area	64.74
Differentiating our degree from the competitors'	56.41
Obtaining competitive advantage	42.31
Consolidating the degree in the university influence area	39.74
Breaking academia inertias, organisational and methodological, which were not working in the degree before the accreditation process	32.05
Expanding market	30.13
Attracting foreign students	16.67
Attracting lecturers	9.62
Stopping the enrolment's diminish	8.97
Only fulfilling the regulations of legislation (Decree 1393/2007)	1.92
Any	0.00
Unknown	0.00
Others	7.69

Market orientation

Table 3: Orientation of the intelligence function according to the aims established in the degree design

Regarding the predominance of *reactive orientation*, four facts indicate reactive practices. Firstly, we have identified a lack of proactiveness and planning of the intelligence function, as a usual activity, because few universities admitted to having sufficient information in the university at the beginning of the adaptation process (11.54%). Secondly, a high percentage of universities indicate that they have searched for information systematically since the beginning of the convergence process (78.85%). Thirdly, although before the publication of RD 1393/2007 universities already had degree referents that could be indicative of proactiveness, other facts denote reactivity. Namely, universities before the adaptation process search reactively for the information needed to draw up a White Book for each degree, or to participate in self-evaluation processes or in announcements to participate in a pilot program. Finally, during the adaptation

process, the consults to stakeholders have increased in front of the scarcity before the adaptation processes (table 4).

STAKEHOLDERS CONSULTED	BEFORE THE PROCESS (%)	DURING THE PROCESS (%)
Professors of the centre / department	33.97	93.29
Students	36.54	82.55
Professionals of the sector or sectors related to the degree	28.21	74.50
Employers of the private sector previously linked to the faculty or university	16.67	71.14
Representatives of professional corporations (Colegios profesionales)	15.38	69.13
Professors of other universities	10.26	68.46
Non-academic staff	21.79	68.46
Representatives of professional associations	17.31	65.77
Graduated students of the university	20.51	61.07
Experts in some branch of knowledge, external to the university	12.82	57.72
Professors of other university faculties	10.26	52.35
Public administrations (such as employers)	16.03	49.66
Social council	4.49	36.24
Occupational observatory	16.67	30.20
Unit of Marketing	7.69	28.86
University- Companies Foundations	9.62	28.86
Representatives of Chambers of Commerce	3.21	19.46
Board of Trustees	7,05	16,78
Other stakeholders	3,85	5,37

Intern
External
Internal organisms

Table 4: Sources of Information: stakeholders consulted, before and during the adaptation process

Organisation of the intelligence cycle

Management of the intelligence cycle in universities is presented through four subjects: a) Detection and collection of information; b) Organisation and storage of information; c) Interpretation and analysis; d) Intelligence generated.

a) Detection and collection of information

Procedures are incipiently formalized. Both during usual activities and during the adaptation process, the information sources used are diverse. Four types of *sources* are employed: 1) Documentary information sources; 2) Commissions, internal working groups, professional meetings and professional networks included digital networks; 3) Stakeholders; 4) Internal units (Table 5).

INFORMATION SOURCES	TOTAL

Those indicated in the White Book	91.03
Web pages of foreign universities	88.46
Web pages of Spanish universities	85.26
Informal contacts – personal relations	78.21
Official web pages of EU institutions related to the EHEA	75.64
Market research about degree of insertion of graduates	70.51
University databases	70.51
External stakeholders	69.23
Research about potential demand of the degree	59.62
Research about work offers published in the labour market	57.05
Professional forums	43.59
Self-evaluation according to the quality system	37.82
Prospection about the socio-economic features of the zone where the university has influence	37.18
Pilot proof	26.92
Internship Reports of students issued by tutors	26.28
Reports or studies drawn up by the Information management Unit	23.08
Reports or studies studies drawn by the Foundation University-Company	19.87
Reports or studies studies drawn by the Social Council	14.10
Clippings supplied by the University Cabinet	11.54
Other sources	11
We have not needed information	7.05
Reports or studies drawn up by the Board of Trustees	5.13
Internet discussion groups	4.49

Collections of information existing inside the university carried out by units or internal department, used as sources during the process of adaptation

Collections of information existing inside the university, that have been able to be elaborated both by units or internal departments, and external organisations

Table 5: Internal and external sources of information employed during the adaptation process

Commissions or working groups, *external professional meetings* and *professional networks and digital networks* facilitate personal contacts in almost all the universities, and, therefore, enable access to information rich contexts. They are highly valued sources; their common use has been intensified in almost all the universities during the adaptation process. During the adaptation process, internal and external *stakeholders* are relevant sources when they have been preferentially consulted. Before the adaptation process, these sources were less consulted (table 4). The wide variety of stakeholders and the intensification of the queries to them are partly due to the requirements of legislation *RD* 1393/2007. This regulation indicates that universities should justify the degree presented to be verified and describe the procedures of internal and external enquiry used to draw up the syllabus. This group of sources has given information to design the degree, and adapt it to the needs of the labour market. In depth, the most frequently consulted stakeholders are students and Faculty professors, followed by professionals in the sector, linked to the degree to be verified – some of them part time professors in the same

university in which they act also as employers – and the professional associations. In addition, they are part of the intelligence networks of each university.

The *organizations* in the *university* (such as Social Council, or Foundation University-Enterprise) are sources employed by 57.69% of those interviewed. Therefore, they are still susceptible for further exploitation in the future. The coordination of work developed by the different units is especially relevant to configure the intelligence networks of each university.

Finally, in the information detection and collection phase we have analysed the *information channels*. Both before and during the adaptation process, universities obtain most information by predominantly formal channels. Exceptions are the informal personal relationships outside the university (78.21%) and formal and informal relationships with professors of other universities (table 5). The predominance of formal channels is coherent with: a) The need to document all the actions carried out, in order to generate evidence of these queries, according to the requirements of the quality management systems and of the adaptation process, according to legislation RD 1393/2007; b) The low predominance of informal information exchange, both before and during the adaptation process.

b) Organisation, storage and dissemination of information

Practices in this phase are in process of formalization, because universities have implemented them in different degrees (table 6). This tendency has continued suring the adaptation process, although the activities have been intensified, even some universities have designed specific procedures.

USUAL TASKS OF INFORMATION MANEGEMENT	TOTAL (%)
It is analyzed in a group / commission / in a specifically created department	52.6
The information obtained is stored and classified	40.38
Conclusions and reports are drawn up	35.90
Information is analyzed individually, according to own interests	33.97
Result of the analysis classified and stored	25.64

Information disseminated by the intranet	23.08
Information disseminated by email	21.15
Reports and the studies generated are disseminated	21.15
Information validity is reviewed and updated	19.87
Specify other actions	5.77
Unknown	0.64

Organisation and storage
Information Validity review
Dissemination and informative products
Interpretation and analysis

Table 6: Usual information management

Information management in universities is usually supported by different applications that organise the information and facilitate its retrieval and dissemination. Nevertheless, the use of these applications is dissimilar and under-used, as has occurred in previous studies about the implication of ICT in universities (Uceda & Barro, 2010).

c) Interpretation and analysis

These activities are quite common between university managers, and increase during the adaptation process, due to the context of pressure. This collective analysis could enable CI practices. Usually 58.98% of managers analyse the information obtained about the environment, and during the adaptation process this percentage increases to 99.36%. Collective analysis is predominant both before (52.56%) and during the adaptation process (69.87%), more than the individual analysis carried out, both before (33.97%) and during the adaptation process (10.90%). The increase in collective analysis during the adaptation process and the significant decrease in individual analyses could be due to the work groups created during the process. This working structure makes it easier to socialize and exchange information (table 6).

The use of *analysis techniques* is beginning to become widespread in universities, although characterized by simplicity, in contrast with more sophisticated techniques implemented in the business sector (Fleisher & Bensoussan, 2008). During the adaptation process, analysis has been

based on self-evaluation guidelines (42.95%) followed at a lower percentage by other techniques such as benchmarking (21.15%) and SWOT (18.59%).

Finally, *capture and storage* of knowledge generated is incipient (table 6). Universities prepare conclusions and reports once the information is analysed (35.90%), which later are classified and stored (25.64%), and the intelligence arising from the analysis is disseminated (21.15%). The low percentage of these activities can explain that during the adaptation process the responsibility of capturing and storing information has been developed predominately by a group or by a commission, instead of being developed by the information unit. The low practice to capture knowledge generated during this phase can influence the perception of the utility of CI practices, if some analyses carried out in the past cannot be used in other processes of decision making (Choo, 2006).

d) Intelligence generated

University governing bodies usually follow a collegiate decision-making model. These governing bodies are established by legislation (LO 4/2007) and university statutes. During the adaptation process, the design of actions and decision-making has been mostly the responsibility of groups or commissions created specifically for these tasks and, as a last resort, of the university collegiate bodies according to their competences. Although this result coincides with the collegiate decision-making model, characteristic of Spanish universities (Troiano, 2004), we detect a political model in the universities' departments to decision-making related to the curricular design of a degree. This model has served to resolve conflicts between different areas of knowledge within a faculty or department.

Regarding generated intelligence applications, during the adaptation process intelligence has

had more applications. In front the habitual use of intelligence to design traineeships for students, during the adaptation process intelligence has been applied in decision-making involved in the degrees: a) Keeping the degree that the department already taught with some adequate modifications, b) Deleting it, c) Designing a new degree without antecedents inside the university, in compliance with the requirements of Spanish legislation RD 1393/2007, and designing the syllabus of the degree.

The contribution of CI to the adaptation process is seen through generated intelligence. Nevertheless, national and autonomic regulations have been able to restrict this contribution and the innovative drive. These regulations have boosted uniformity between universities, and consequently restrict innovation, as some of the interviewed have stated (51.28%). This result coincides with previous research (Pagès, 2006; Serra, 2006).

Peculiarities of the higher education sector

The Higher Education sector displays some *similarities* with business sectors, but it also has *organisational peculiarities*. Regarding the *similarities*, we ascertain that universities, both public and private, like business sector organisations, intensify their CI practices in the face of uncertainty perceived in the environment. When they have competition, universities also try to find their own market niches. Besides these similarities, we find *peculiarities of the university sector* that influence the CI practices. Firstly, universities present specific organisational features that influence the orientation of the intelligence function: a) Spanish legislation (LO 4/2007) determines the governing bodies, which creates some rigidity and uniformity in university organisation, which can limit the impact of CI practices in the creation of competitive advantages; b) Their top managerial staff is elected according to legislation (LO 4/2007), which can hinder the continuity of previous actions designed during a former mandate, and the short-

term kind of actions, avoiding long-term actions due to a lack of immediate return of the actions; and this consequently influences the tactical orientation of the CI; c) The power of decision is fragmented and diffuse, influencing decisions that affect the totality. Secondly, universities have objectives such as providing social benefit and optimising resources given by public administrations, foundations or boards of trustees. This influences the orientation of their non-lucrative activities, some organisational procedures, and the way they develop activities and identify stakeholders. Thirdly, customers – as employers or students – can be part of the university structures and of governing bodies. Therefore, customers can be part of the intelligence networks more intensively than business sector customers. Hence, universities could obtain information about environment needs with greater frequency, as well as more fluent and rich analysis. Fourthly, the perception of the competition can be present in the governing bodies depending on: a) The situation of each university in its sphere of influence in the city or in its autonomous community, b) The number of pupils enrolled in each degree. Finally, as we have pointed out before, we consider that the sector regulations could have a negative influence on innovation, coinciding with previous studies (Pagès, 2006; Serra, 2006).

Conclusions

We have identified CI practices in universities as discontinuous, tactical and reactive and with lack of formalization. During the adaptation process, although these practices are tactical and reactive, they have been intensified and have evolved to some periodicity with some strategic orientation. Firstly, intensification is due to the university's social responsibility and accountability for using funds for the triple mission of the universities. Therefore, the inclusion of procedures to obtain and process information about the environment in the quality system could be a way to consolidate CI practices in universities. Secondly, by a circumstantial fact, CI practices have been intensified in universities due to the pressure and uncertainty that has

characterised the degree verification process. Moreover, universities have manifested a will to formalise practices in order to obtain greater performance of the information acquired. If that happens, CI practices could be consolidated.

Thus, CI practices are becoming more formalized, especially actions to obtain and analyze information. Considering the first structural fact, there are indicators that this development will continue. Nevertheless, in order to evolve and design actions for improving CI practices in each university, we should take into account the different evolution from one university to another depending on two facts: Perception of the environment, and more specifically, perception of the adaptation process as an opportunity to improve the training offer, or as a simple administrative formality.

Taking these factors into consideration, universities should formalise CI in universities that could attenuate the factors influencing the CI practices negatively. Firstly, it is necessary to define the intelligence function, with an explicit formula, defining responsibilities and coordinating efforts. Decentralisation is the prevalent organizational formula, and intelligence networks decentralised emerges as adequate formula to universities, coordinated by a vice-chancellor, a dean, or a vice-dean. Secondly, it is necessary to define integral procedures to manage information (collect, classify and store information about the environment) in order to avoid duplicate data and coordinate the different efforts allocated to CI practices in universities. These procedures could improve best practices for information management between university members, since they are part of their intelligence networks. Topics to be considered should be: establishing search frequency, identifying information needs, and aligning CI practices with the strategic aims of the university and the degree. Thirdly, it is necessary to boost informational habits, to intensify information systems in universities to obtain maximum performance, and to

share information, promoting the habit of communication and analysing information in order to obtain the maximum performance from the time invested in the environmental scanning. Finally, universities should hire information professionals to carry out specific CI activities. This facilitates the optimisation of the intelligence cycle, and enables decision makers to invest more time in the decision- making processes.

With regard the peculiarities of the higher education sector – specific organisational features and decision-making styles – their negative influence on CI practices could be neutralised if universities promote informational culture and systematic procedures in the CI function and cycle. In front, we have identified similarities with CI practices in business fields. Consequently advances obtained by other studies in these fields could be applied in the university field.

To sum up, CI is becoming a strategic management tool in universities, although actions should be taken to design, implement and systematise CI practices and overcome the inhibiting factors detected. Nevertheless, CI could also prove valuable in other university management fields. For instance, to identify in which fields universities could develop applied research projects, to establish cooperation between universities and companies to improve knowledge and technological transfers, or to design alliances between universities for more competitiveness.

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Authors

Montserrat Garcia-Alsina (corresponding author)
Information and Communication Sciences Department
Universitat Oberta de Catalunya

Rambla del Poblenou, 156
08018-Barcelona
Telephone number (+34) 93 326 36 94
Fax number (+34) 93 356 88 22
mgarciaals@uoc.edu

She holds a PhD. in Information and Knowledge Society from the Universitat Oberta de Catalunya (UOC) (Spain), and is graduated in Information and Documentation from Universitat Oberta de Catalunya, and in Geography and History from Universitat de Barcelona (Spain). She works as lecturer and researcher in UOC, in the Information and Communication Sciences Department, on the Documentation programme. Her research interests focus on subjects related to records and information management and in particular on competitive intelligence in both public administrations and the business sector. Her dissertation was about the contribution of competitive intelligence to the Spanish university in the process to adapt the degrees to the European Higher Education Area. She is a member of KIMO research group (Knowledge and Information management in Organizations). She has published different books and papers related to her research topics in relevant publications.

Josep Cobarsi-Morales
Information and Communication Sciences Department
Universitat Oberta de Catalunya
jcobarsi@uoc.edu

*He holds a Telecommunications Engineering Degre from Universitat Politècnica de Catalunya and a PhD in Organisational Management from Universitat de Girona. He works as a lecturer in Universitat Oberta de Catalunya, in Information and Communication Studies, on Information Science degree programme and Knowledge and Information Society doctoral programme. Her research interest focus on competitive intelligence, academic information systems and social networks analysis. H*e is a member of KIMO research group (Knowledge and Information management in Organizations). *He has published different books and papers related to his research topics in relevant publications such as ASLIB Proceedings and El Profesional de la Información.*

Eva Ortoll
Information and Communication Sciences Department

Universitat Oberta de Catalunya
eortoll@uoc.edu

She holds a PhD in Information and Documentation Systems from Universitat de Zaragoza (Spain) and is a graduate in Documentation from Universidad Carlos III de Madrid (Spain). She is a lecturer and researcher in the UOC´s Information and Communication Sciences Department. Her research focuses on the study of individual and corporate information behaviour, competitive intelligence and social networks. She is a member of KIMO research group (Knowledge and Information management in *Organizations). She has published different books and papers related to her research topics in relevant publications such as ASLIB Proceedings and El Profesional de la Información.*