WORD COUNT: 6.384

MANAGEMENT OF INTANGIBLES: AN ATTEMPT TO BUILD A THEORY

This is a post-print version of a published article. Please cite as:
Sanchez, P.; **Chaminade, C**. Olea, M. (2000) *Management of Intangibles*: *An Attempt to Build a Theory*, Journal of Intellectual Capital, vol 1, nº 4, November, pp. 312-327.

Authors:

Prof. Paloma Sánchez
Dr. Cristina Chaminade
Ms. Marta Olea

AUTONOMOUS UNIVERSITY OF MADRID

Address for correspondence:
Paloma Sánchez
Tel: 34 91 3882189 Fax: 34 91 7599612
E-mail: canibano.sanchez@retemail.es

This study was developed within the framework of the MERITUM (MEasuRing Intangibles To Understand and improve innovation Management) project. The financial aid provided by the European Union within the framework of the TSER (Target Socio-Economic Research) program is gratefully acknowledged.

ABSTRACT

This paper attempts to contribute to the development of a positive theory on the management of intangibles by building a model that describes the process followed by business firms willing to implement a system for the management of intangibles. Our study reveals that companies usually take three steps: the identification of critical intangibles related to value creation, the measurement of those intangibles by means of a set of indicators and, finally, the monitoring of intangible resources and activities.

KEY WORDS

Intangibles; Intellectual Capital; Management of Intangibles; Knowledge Management.

TABLE OF CONTENTS

INTRODUCTION

It is nowadays widely accepted that innovation is the dominant factor in national economic growth (OECD, 1996). The innovation process has been studied for decades but only recently have we started to understand how complex it is and how many different factors may affect its direction, speed and characteristics. Because of the very many studies made, particularly by the scholars of the so-called evolutionary economics, we know now that the linear model of innovation (Nelson, 1959, Arrow, 1962) is almost a fiction and that the interactive model of innovation (Kline and Rosenberg, 1986) is much closer to reality.

However most of the efforts to describe, analyse and measure the innovation process and its effects are restricted to technological innovation. That is the case with the OECD and EUROSTAT surveys (European Commission, 2000). While a few years ago organisational innovation was considered as "other type" of innovation, being technological innovation the "real" one, our hypothesis is that changes in management practices, particularly in human resource management, are preconditions for innovation, and therefore understanding and measuring them accurately becomes crucial[i].

In this new world, knowledge is source of competitive advantages and, thus is considered among the main production factors to monitor and manage. Knowledge is the main intangible ingredient in the melting pot that makes innovation possible and therefore, the measurement of knowledge is a key issue. There are other intangibles in that pot and the main objective of this research is precisely to provide insights into them.

In this context there is a need for information on the intangible determinants of the value of companies that will help improve the decision making process of managers and stakeholders.

The purpose of this research is to provide evidence on the "best practices" in the measurement of and disclosure of information on intangibles by Spanish companies. We intend to ascertain *how* the management control of intangibles is carried out, *why* and *when* organisation members do what they do, and *how* people, organisational units, etc. interact. For doing so, several case studies have been carried out.

Our results may contribute to the development of a positive theory on the management of intangibles in that they may be used as a benchmark for comparisons across companies, industries and countries, following the Grounded Theory method (Glaser, B. and Strauss, A., 1967). Both the description of the best practices and the theory will provide a sound basis to draft a set of Guidelines for measurement and disclosure of such investments.

The remainder of the paper is structured as follows. Section 2 contains the conceptual framework, explains the economic theories that sustain the conceptualisation of intangibles and presents the main concepts, Section 3 contains the model for the management of intangibles. Section 4 gives some examples of the implementation of the model and finally, section 5 summarises the main conclusions.

1. CONCEPTUAL FRAMEWORK

The concept of knowledge and its role in the economy varied greatly in the second part of the XX century. Since the so called neo-classical to the more recent theories about the learning firm, the importance of knowledge in the firm's management process has changed dramatically.

Until the 1980s, the mainstream of the management theory focused on business environment (industry structure) as the ground for understanding competitive advantage. Aligned with the ideas of neo-classical economics, it was assumed that resources were homogeneously distributed within the industry and that

they were easily accessible by competing companies. Knowledge was assumed to be equal to information and furthermore, it was free, available, generic and easily adapted to the firm's needs. Therefore, the role of management was to find the way to combine products and markets, given the bargaining power of suppliers and customers, entry barriers and potential substitute products and technologies. The message of this line of thinking was to worship the environment instead of focusing on the inside of the firm.

During the 1980s those previous ideas were challenged by what was later denominated resource based perspective. Describing some elements that had already been announced by Penrose (1959), followers of this school suggested that competitive advantage was not reached only by different combinations of products and markets in a given industry but, on the contrary, it was mainly due to differences in organisational resources of different kinds (Wernerfeld, 1984). As resources cannot always be transferred or imitated, we should look inside the company for the identification of real sources of sustainable differences among firms. That is, to focus on the firm's inside and not only on its environment (Roos, 1996).

Furthermore, Barney (1991) developed four criteria for determining what kind of resources provided a competitive advantage: (1) value creation for customers, (2) rarity, in comparison to competence, (3) imitability, and (4) substitutability. The only resources that seem to pass this test are “intangibles”, either if they are named, knowledge, invisible assets, absorptive capability (Cohen y Levinthal, 1990), core competencies, strategic assets, core capabilities (Zander y Kogut, 1995), intangible resources (Hall, 1992), organisational memory (Walsh y Ungson, 1991) or any other denomination with a similar meaning.

The introduction of these ideas coincided with an original work in the management area by Itami and Roehl (1987). Although the authors did not give a definition of what invisible assets are, they consider them as the most

important resources in production processes. These assets are based on information, and can include anything from customers loyalty to technological skills or internal goodwill.

The very well known and broadly applied concept of core competencies (Prahalad y Hamel, 1990) is another example of intangibles as a sustainable competitive advantage. In line with Barney (1991), one of the requirements that allows a competence to be considered as "core" is that it be hard to imitate by competitors.

Thus, intangibles are important in management processes as they have become a crucial resource for the firm. And this is mainly due to their impact on innovation processes. The most important contributions to the understanding of these concepts have arisen from two major bodies of literature: the theory of technical change and human capital theory (Ducharme, 1998).

The first contributors of the economics of technical change mainly focused on research and development (R&D) activities, but in more recent studies (Pavitt, 1984, Dosi, 1984, Freeman, 1986 or Nelson and Winter, 1982) it has been shown that innovation processes have more to do with the recombination of existing knowledge than with the creation of brand new knowledge through R&D. Firms are involved in a complex learning process, where not only the funding or R&D is essential, but also the propriety of knowledge through intangible investments (Ducharme, 1998).

The human capital theory emphasises the importance of individuals considering them as investors. Individuals will invest in their education and training in order to achieve future benefits. Thus, human capital is considered as an asset, similar to physical or financial assets. Mincer (1989) summarises that human capital plays a dual role in the process of economic growth: 1) as a stock of skills, generated by education and training, that is, as a productive factor that co-operates in the production of the final output; 2) as a stock of

knowledge, that can be accumulated and is the source of innovation, thus, a basic cause of economic growth. It is from this second perspective that the conceptualisation of intangibles is explained by the human capital theory.

Managing knowledge is about transforming the individual knowledge (tacit knowledge) into explicit knowledge, selecting the knowledge that will be useful for the firm, and re-using that knowledge in a way that helps increase or acquire intangible resources.

There is not a broadly accepted definition of "intangibles". As stated by Cañibano and Sánchez (1998), it is actually an adjective that goes along with different concepts, such as assets, investments, resources, etc. However, the adjective is often used as a noun, and this is a good proof of the existence of significant difficulties when trying to find a right qualification.

Furthermore, the terms *intangibles* and *intellectual capital* are often used in different contexts although they seem to be attached the same meaning. While intangibles appears to be an accounting term with a *balance sheet* orientation, intellectual capital is more frequently used in the realm of human resources (Vickery, 1999).

Intangible resources, following Hall's (1992) proposal, are considered as "assets" in a broad sense, that is, intellectual property rights, trademarks, certain information technology such as data bases, networks, etc., and "skills", i.e., capabilities and competencies, such as those of the human capital. The intangible resources of a company, a static notion, can be measured at a given moment.

Those resources can also be analysed in dynamic terms. Companies are undertaking activities to acquire or internally produce intangible resources, on one hand, and to measure and manage them, on the other. Although the activities undertaken are always costly, companies are not always able to

measure and keep track of those costs. In general, we will consider those costs as "intangible investments", which can be defined as a set of expenditures, sometimes not expressed in financial terms, that may or may not appear in the corporate financial reports, and either give rise to new "intangible resources" or allow a more efficient use of existing ones. These "intangible resources" are likely to increase the future value of the company, in general and its innovation capacity in particular.

Management of intangibles is a much broader concept than *knowledge management*. Its main purpose is to enhance the firm's value through the creation of competitive advantages. Managing intangibles involves identifying them, assessing their links with the present and future value of the firm, measuring their value, discovering intangible activities and, finally, being able to efficiently manage those activities. Knowledge creation is an intangible that firms should manage as well as other main intangibles, so it means that knowledge management is a subset of the management of intangibles.

The difference between these two concepts that are often used in similar ways, may be appreciated by comparing two situations:

> When a company tries to assess how information technologies investments are affecting its innovation capacity and, at the same time, how this innovation capacity is creating value, and when the company tries to define indicators in order to measure and manage this intangible, we are talking about management of intangibles and not about knowledge management.
>
> When a company searches for indicators to measure the customer satisfaction level we are doing again management of intangibles instead of knowledge management. Once the company processes and analyses the information, once the company acts intelligently on that information to obtain knowledge, only then, we could talk about knowledge

management but the whole previous process would take part of the management of intangibles process.

The next logical step to better understand the nature of intangibles is to categorise them, and to focus on their implications for the daily management of companies. That means to focus on what to measure, according to the view that "you can manage what you can measure".

According to The Cambridge Institute for Applied Research, when approaching to the measurement of intangibles, there are three different methodologies (Abdolmohammadi et al., 1999 web page):

1. The first method is based in the concept of Return on Assets (ROA). A company can compare this ratio with the company's industry average to calculate the difference. If this difference is positive, it is assumed that the company has an excess value of intangibles in relation to the industry. If this excess is multiplied by the company's average tangible assets of the period, the result will be the average annual excess earning over the industry. Dividing this excess earning by the company's Weighted Average Cost of Capital (WACC), one can derive an estimate of the current value of its intangibles. Using this methodology it is assumed that the assets of a company will not grow in the future. To make up for this problem, the growing assets nominal rate would have to be deduced from the cost of capital. This method is simple to use and the information needed is easily available from financial statements.

2. The second method is based on the concept of a valuation premium in the capital market. The Market-to-Book ratio shows the excess of a company's market capitalisation over its stockholders' equity and it can be derived then that it is due to the intangibles owned by the company. To calculate this ratio more accurately, the historical financial statements must be adjusted for the effects of inflation or replacement costs. Using historical data may distort the measurement particularly in industries with large balances of old capital assets.

This method provides a market measure of a company's value of intangibles. The market information on the company's stock price is readily available, but historical financial statements, as mentioned, should be adjusted for current replacement costs.

The third approach identified by The Cambridge Institute for Applied Research is, in our opinion, very different in nature from the two previous ones. It is a method based on measuring the value of intangibles by first identifying its different components. Once these components are identified, they can be measured through indicators. This method is the most complex and expensive because of the large number of components that have to be identified and individually measured, but it is also the most accurate way to measure the value of intangibles, taking into account that the other two just report the total value of intangibles but do not show any component.. Nevertheless, every intangible can be measured through different scales or units, they could not be added up at the end, but this is not seemed as a problem when the aim of a company is to develop a system to properly manage its intangibles. This is the approach used within the context of our research, whose main results will be described next.

2. MANAGEMENT OF INTANGIBLES. A MODEL FOR THE ANALYSIS

The main purpose of this study was to analyse good practice by Spanish firms with regard to the management of intangibles. The main hypothesis underlying the study (Cañibano, L.; Sánchez, P., 1998) is that good practice enterprises differ from other enterprises concerning the management control of intangibles. Intangibles are normally neither reported externally nor integrated in internal

management accounting. Nevertheless, they are in some way handled in the management control process, normally in an informal way.

Good practice enterprises are expected to be well aware of the importance of intangibles critical for the success of the firm. These firms are also expected to identify, measure, report, communicate and evaluate important intangibles in the management control process. The following reflections are based on the analysis of firms which considered the management of intangibles as a strategic issue related to their ability to create value. In some cases, the firm had some previous experience in the measurement and management of intangibles; in some others, the firm was about to start their intangible management system. The approach used with both types of firms was slightly different. In the first cases, they were inquired about what they were doing and in the second case, they were inquired about what they thought they should do. The results of the analysis are presented next.

The way the firm develops its intangibles measuring system will depend much more on the use the firm wants to give to that information. Firms might be willing to measure their intangibles for internal or external purposes. In the first place we are talking about measuring for managing, that is, trying to know what are the critical intangibles in the firm that need to be monitored in order to attain the strategic objectives or to enhance their core competencies. In the second place, we are talking about the need to provide to third parties with useful information about the real value of the firm.

Firms usually follow a common pattern when developing their intangible management system. As Figure 1 shows, three different phases can be identified:

1. Identification of intangibles
2. Measurement
3. Management

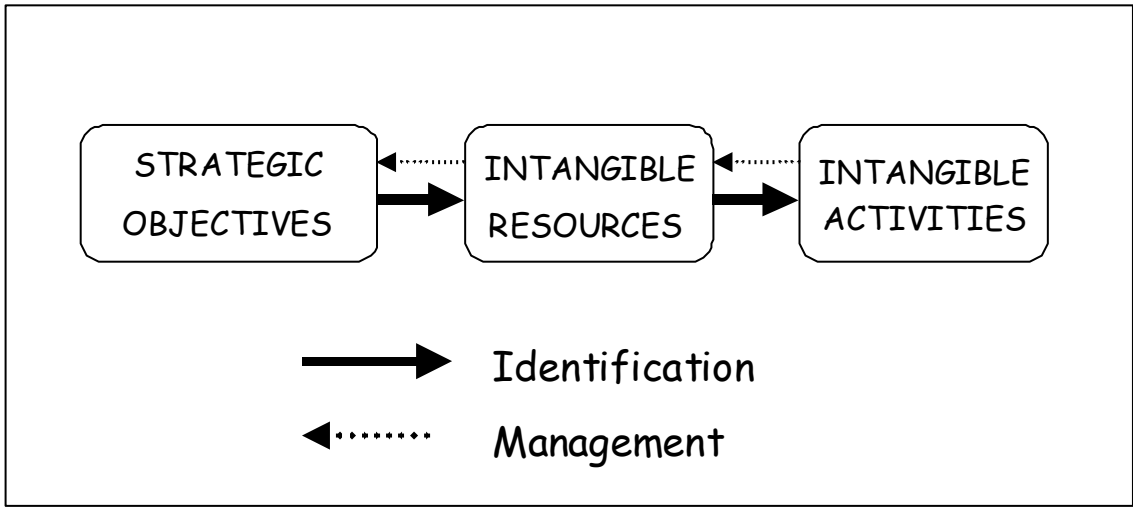
Firms whose main purpose is to internally manage their intangibles in order to create value will at a first stage, try to identify those intangibles strongly related to their strategic objectives.

Thus, the identification phase focuses on what can be called critical intangibles. The firm needs to determine what its strategic objectives are and what intangibles are more strongly related to them. They are not only concerned about the intangible resources but also about what they have to do in order to create and increase those critical intangibles. That is, what are the activities that affect positively and negatively their intangible resources? (Dynamic dimension). It is important not to focus only on those activities that might increase the level of critical intangibles but also to consider those that might impede or even decrease their intangible resource level.

Once the firm has completed this first phase, it starts looking for good measures for those intangibles. In this stage, it is important to focus both on the quality, utility and feasibility of the indicators and on the links between intangibles.

Furthermore, companies will inquiry about their future strategic objectives. They need to link current intangible investments with their long term strategy, that might contain certain objectives that at present are not considered. Most of the intangible investments will produce uncertain returns in the future, so firms cannot allow themselves any myopia in this strategic view. Figure 1 presents a graphic representation of the model.

Figure 1 . A comprehensive model for the analysis of intangibles



The first step in the analysis is, thus, the identification of the strategic objectives of the firm. Once this first phase has been accomplished, then it comes to the identification of those related intangibles (we have called them intangible resources) and the discussion of which activities affect the level of those critical intangibles and, as a consequence, their performance. Finally, the firm will look for good measures to monitor the level of those intangible resources and the performance of the selected intangible activities.

The model should be understood in a dynamic sense. The firm measures the level of intangible resources in a given time (t). Then it develops different activities that might affect the latter and, it measures them again in period t+1. This way, the firm can monitor the different changes in their intangible resources level as a consequence of its management procedures.

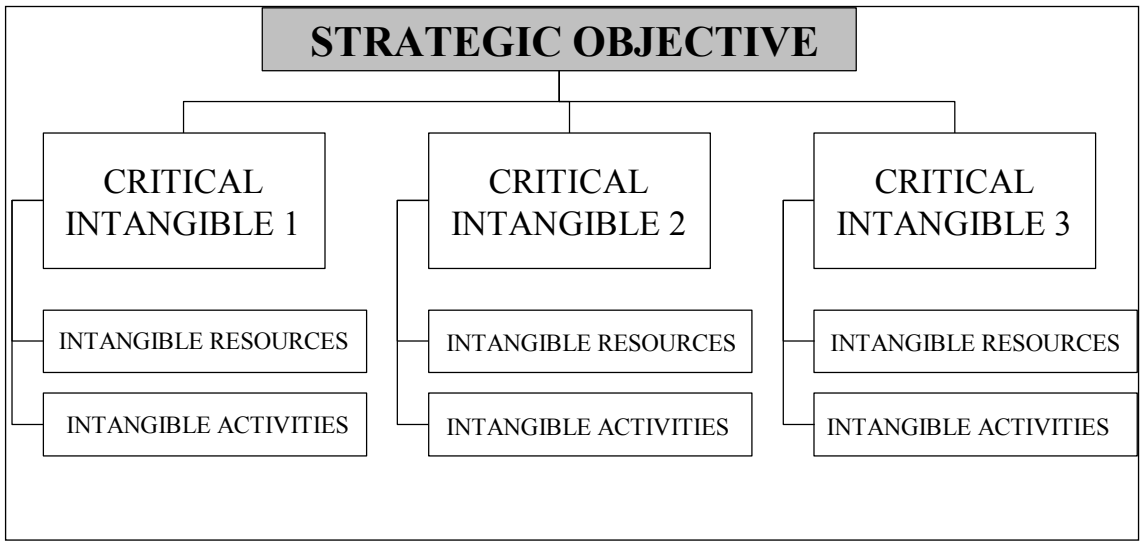
Identification

Regarding the ***Identification phase***, as it was said before, firms usually focus only in those variables that are linked to the present or future value creation of

the firm. This requires to inquiry about what their strategic objectives are. To obtain that information, the firm has to answer the following questions: where am I?, where do I want to go?, what are the challenges? And then, what do I need in terms of intangibles? Usually they emerge as a result of internal discussions or brainstorming sessions, in most cases with the intervention of external experts who might be an excellent help for companies that are taking their first steps into this matter. This can also be used to discuss the related critical intangible resources.

As a result of this in-depth analysis of what the intangibles more directly related to the strategic objectives of the firm are, a network of intangibles emerge.

Figure 2. Network of intangibles



At the top of the Pyramid, we find a set of critical intangibles that might help maintain or enhance the firm's competitive advantage or reach the strategic objectives. These are "abilities" that the firms need to develop in order to attain the strategic objective.

A range of activities and resources might affect each critical intangible. In most cases, the firm does not know exactly the precise impact of each activity over

the resource but has a fairly good feeling (based on its previous experience) that it is affecting the critical intangible resource. This is enough to consider it as an intangible activity or, in other words, as an intangible investment. In next section, an example of a network will be given.

Measurement

Once the critical intangibles have been identified and the pyramid of relations has been build, the firm needs to define specific indicators that serve as a proxy measure for each intangible. Thus, a set of indicators is defined and developed for each intangible. Both intangibles and indicators can be classified in several ways. Next, the approach recommended for the analysis is described.

The set of intangibles and indicators used is based in several sources of information (Danish Trade and Industry Development Council (1997), Lunde (1998), Bankinter (1998), Brooking (1996), Cañibano et al. (1999b), Finanzia BBV (1997), BBV (1998), Ericsson (1997), Repsol (1998), Indra (1998 and 1999).

The main features of the developed measurement system are summarised in Figure 3.

Figure 3. Main features of the measuring system

LEVEL OF ANALYSIS	CLASSIFICATION OF INTANGIBLES (Variables)	CLASSIFICATION OF INDICATORS (Measurements)
Intangible Resources	Human Capital	General
Intangible Activities	Structural Capital	Industry Specific
	Relational Capital	Firm Specific

First it would be useful to distinguish, as mentioned, two levels of analysis: intangible resources and intangible activities.

Regarding the classification of intangibles used it would be desirable to distinguish between Human Capital, Structural Capital and Relational Capital[ii]. Most firms can clearly distinguish these three groups of variables. It is clear that, in some cases, it is hard to classify into categories. It this sense, it can be said that these three groups are not mutually exclusive but intend to be operative.

Human capital is defined, in a very simple way, as the knowledge that the employees take with them when they leave the firm at the end of the day. That is, for example, their expertise, educational level, etc. Conversely, Structural capital is defined as the pool of knowledge that stays at the firm at the end of the working day, as, for example, the firm's routines, culture, databases, etc. Finally, the Relational capital is defined as all the intellectual capital linked with the external relationships of the firm, as, for example, the relation with customers.

Regarding the indicators they all have to be clear, feasible and useful for the firm. By clearness it is meant that it has to be well defined to avoid ambiguity; by feasibility, it is meant that the firm has to be able to collect the required information for the indicator; and by usefulness, it is meant that it has to be meaningful for the firm.

Furthermore, it is useful to distinguish between general, industry specific and firm specific indicators. It is assumed that an indicator is industry specific when it refers to processes, definitions, etc. that are particular of that industry or that might differ from manufacturing to services. On the other hand, an indicator is firm specific, when it requires a previous definition by the firm, for example, any indicator referring to "high potential" employees would require a definition of what the company considers as "high potential" employees. These latter are thus not comparable across firms.

Indicators might be financial or not financial, and this applies both to intangible resources and intangible activities. It is clear that intangible activities are always costly for the firm, but the firm is not always capable to estimate the cost of that activity or, in some others, it is considered so strategic that they do not even care about its cost. It is clear that, for the management process, it would be desirable to have indicators of the impact on financial variables. It is neither possible nor worthy for the firm to assess the individual impact of each activity or intangible investment on its performance. The most advanced firms are, usually, capable of identifying general value-chains that link several activities with some performance indicators.

For each indicator on the intangible resources, the firm would have to check whether that indicator is feasible, useful, important for the creation of value, and, finally, if it can be disclosed. Whenever possible the cost of the different intangible activities, and the effects of such activities on performance indicators, should be assessed.

Monitoring

Once the measurement system is developed and implemented, firms must analyse their **results** internally. This task is usually assigned to top managers. It is important to notice that the results obtained are not always linked to any rewarding system, as other traditional indicators are. In many cases what firms attempt to implement is a culture of generosity among their employees.

Concerning the monitoring of intangibles, it is important to bear in mind that once firms have produced the indicators for the measurement of intangibles they do not always intend to maximise them. The objective for some intangibles may be to reach an optimal level, while for some others may be desirable an increase or decrease.

3. MANAGING INTANGIBLES IN PRACTICE. SOME EXAMPLES

The previous section has focused on the process that firms follow when trying to implement a system for the management of intangibles. The described model emerged as a result of a set of a series of in-depth case studies. The model has been used in those firms who did not have any previous intangible management system, and modified taking into account their suggestions. This section summarises the results of our study.

As it was previously mentioned, three steps can be distinguished in the management of intangibles: Identification, Measurement and Monitoring. The result of the identification phase is a network of intangibles, related to the strategic objectives.

Figure 4 provides an example of this network of intangibles. At the top, the firm has identified that in order to reach the strategic objectives, they need to be

capable of reacting to changes, be able to retain and attract key employees and, finally, they have to be able to fulfil the customers requirements.

All this embracing categories are the consequence of other intangibles. For example, the ability to adapt to environmental changes, will rely upon the innovative capacity of the firm, among other items. And this variable, at the same time, will rely on flexibility, for instance.

It is clear that most firms will like to monitor their capacity to react to environmental changes, or their ability to attract and retain key employees as they are fundamental determinants of value for any firm in our present economy. Therefore, this example could be seen as a generic pyramid of intangibles, a reasonable starting point for companies trying to identify their intangibles and the existent links among them, though it must be adapted for each company.

Once this identification phase has finished and the network of intangibles related to each strategic objective has been developed, the firm should start looking for good indicators.

Firms tend to identify and measure different intangibles, depending on their strategic objectives. Table 2 shows some examples of these intangibles, distributed into resources and activities and classified in the three categories previously mentioned: Human capital, Structural capital and Relational capital.

Figure 4. Network of intangibles. An example.

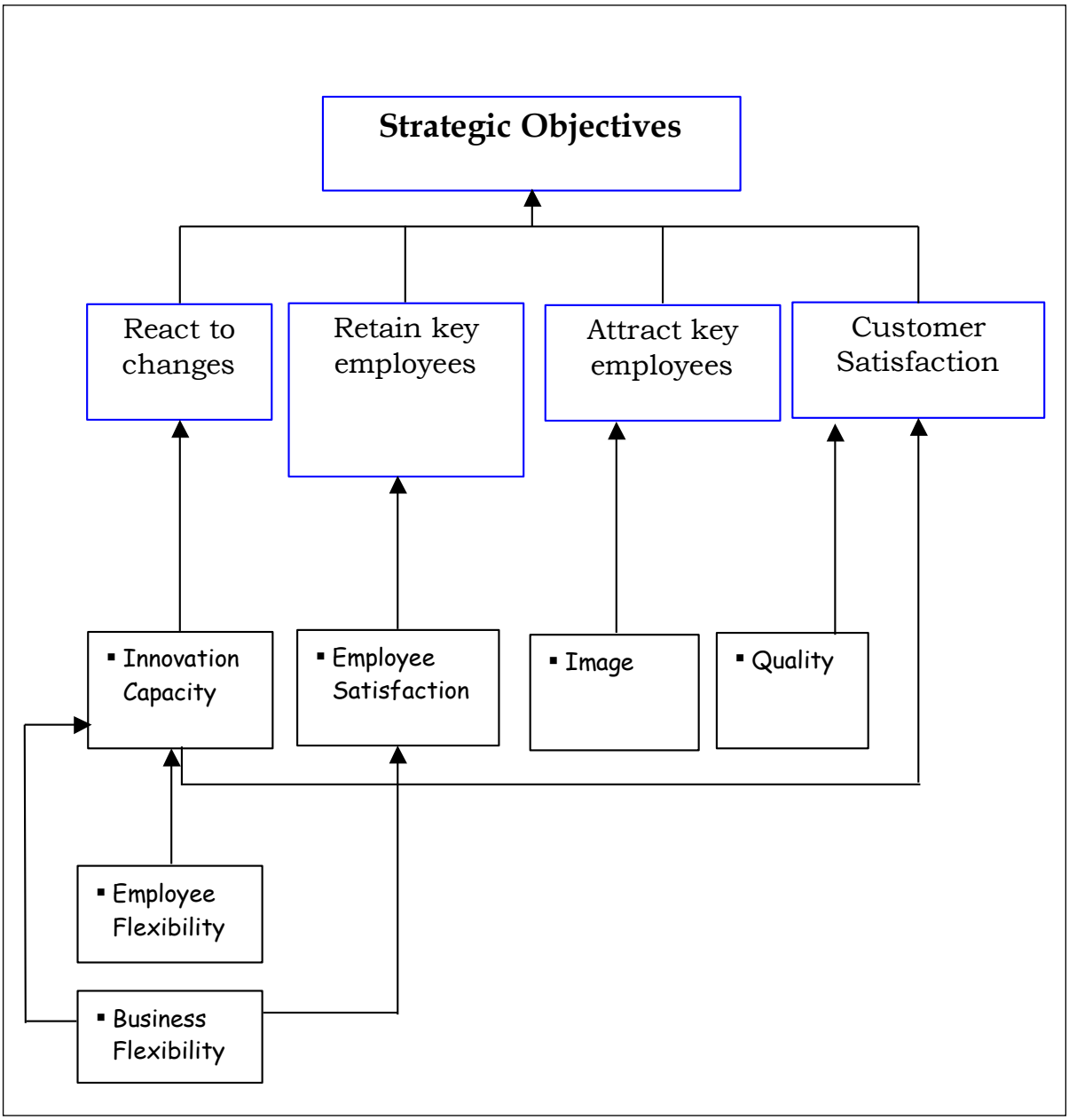


Table 2. Structure of the Measurement system. Some examples of Intangibles

	Human Capital	Structural Capital	Relational Capital
Intangible Resources	▪ Experience ▪ Education ▪ Flexibility	▪ Innovations ▪ Patents ▪ Flexibility	▪ Fidelity ▪ Market share ▪ Image
Intangible Investments	▪ Training ▪ Rewarding system	▪ Quality ▪ Innovation expenditures ▪ Processes	▪ Customer satisfaction ▪ Marketing

Following our previous example plotted in Figure 4, the innovations that the firm has achieved represent an intangible resource that is part of structural capital. This intangible resource can be leveraged through innovation expenditures, which will be an intangible activity. In the same line, the level of education of the employees (which is related to the innovative capacity of the firm) can be leveraged through training activities.

It is important to stress that any critical intangible might be affected at the same time by intangible resources and activities that might fall under any of the three considered categories of capital (Human, Relational and Structural). That is, most critical intangibles will be the result of activities developed under the human capital, structural capital and relational capital. The interactions of these three categories is extremely important.

From the analysed firms it seems that they usually focus on the Human Resources category. Most of the variables and indicators correspond to this group, while there are not as many indicators of the Structural Capital and the Relational Capital.

The Relational Capital indicators are usually based on a customer satisfaction survey. The frequency of the implementation of this survey varies greatly from one firm to another. It seems that there are significant differences between industries in the frequency of data collection regarding their customers.

It appears that most of the main intangibles (abilities that the firm has to develop in order to attain the specific objectives), are common to all surveyed firms. What makes the difference is the indicator developed and the importance that the firm gives to each of them in relation to its advantages and shortcomings.

Regarding the comparability of the indicators, most of the proposed indicators are general, that is, they can be compared among industries and enterprises. In

some cases, the comparisons are made with the most advanced companies in the management of intangibles, and not with other firms in the same industry. In this way, what is interesting to observe is that "same culture" could be a more adequate approach than the "same industry" when making comparisons.

Indicators and intangibles might change throughout time while the environment and the firm's specific objectives evolve. Far from being rigid, each year firm has to develop some new indicators to be able to monitor change.

Firms are concerned about the link between intangibles and traditional performance indicators. The effect of an intangible investment is not immediate, but it will be important to find it out.

Regarding the disclosure of indicators, and as a general trend, it can be said that firms do not hesitate to disclose most indicators, even though they have developed them for internal purposes. Disclosure is seen as something profitable because it is not easily imitated; nevertheless, they do not want to disclose the way they have come to that specific indicator. That is considered as strategic for the firm.

4. CONCLUSIONS

The experience gained from the case studies has provided us with an exploratory basis of how firms are measuring and managing their intangibles. We have attempted to develop a comprehensive model described in the previous section. The following aspects have to be taken into consideration:

i) The management of intangibles is broader than the management of knowledge. It involves the identification of intangibles linked to the present and future value of the firm, their measurement and finally, the implementation of those intangible activities that might be positively affecting the level of the

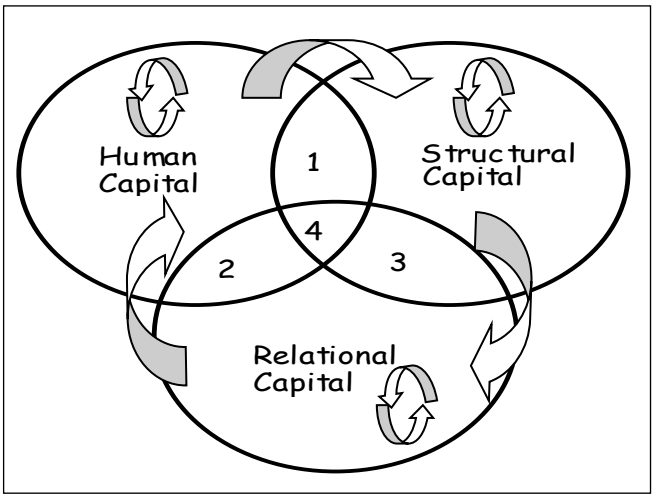
critical intangibles, with the sole purpose of developing competitive advantages.

ii) In this sense, firms are concerned with those intangibles that are, somehow, related to the creation of value. Thus, their efforts are oriented towards the identification of those intangibles and its further measurement and management.

iii) The implementation of an information system for the management and control of intangibles, follows three different phases. First, the identification of the critical intangible resources related to the firm's strategic objectives. Then, the discussion on which activities (intangible investment) and resources (intangible resources) are affecting the existing critical intangibles in a positive and negative way. Once the identification phase is completed, the next step is to develop some useful indicators for each intangible resource and activity. Those measures have to be feasible, meaningful and useful for the firm. The final step in the whole process is the monitoring, that is, the implementation of the intangible activities and the periodic revision of the whole model to adapt the new challenges.

iv) Thus, the model distinguishes between intangible resources (stocks) and intangible activities or investments (dynamic). Regarding the intangibles, a distinction should be made between Human Capital, Structural Capital and Relational Capital. There are continuous interactions between the three blocks. The links between these three categories are represented through intangibles that can be found in more that one category, but with different indicators. For example, the flexibility can be attained through actions on the human capital, the structural capital and the relational capital (n 4 of Figure 5). For each category the indicator will be different.

Figure 5. Groups of intangibles of the intellectual capital



v) The proposed indicators might be general, specific for the industry or specific for the firm. All the indicators should fulfil a threefold requirement: clearness, feasibility and usefulness.

vi) Finally, and related to the whole management of intangibles process, it should be stressed that the Intellectual Capital of the firm can be increased either by leveraging the level of Human Capital, Structural Capital and Relational Capital or by promoting the interactions between the three groups. They should not be seen as watertight compartments but as a highly interlinked groups of intangibles.

5. REFERENCES

Abdolmohammadi, M.H., Greenlay, L. and Poole, D.V. (1999), Accounting Methods for Measurement Intellectual Capital, in the web page of The Round Table Group http://interaccess.com/rtg/scholars/articles/acctg-intellectual-capital.html October.

Arrow, K. (1962), "Economic welfare and the allocation of resources for invention" in Nelson, R. (Ed.), The rate and direction of inventive activity, Princenton University Press, Princenton, pp. 609-629.

Bankinter, (1998), Annual Report.

Barney, J. (1991), "Types of Competition and the Theory of Strategy: Toward an Integrative Framework", *Academy of Management Review*, vol.11, No 4, pp. 791-800.

BBV (1998), Annual Report

Brooking, A. (1996), Intellectual Capital. Core Asset for the Third Millennium Enterprise, International Thomson Business Press, London

Canibano, L.; Sanchez, P. (1998), Measuring intangibles to understand and improve innovation management. A Research Proposal to the TSER Programme. Autonomous University of Madrid.

Cañibano, L.; Garcia-Ayuso, M.; Sanchez P. (1999a), Accounting for Intangibles: A literature review. Forthcoming in the *Journal of Accounting Literature*.

Cañibano, L.; Garcia-Ayuso, M.; Sanchez P.; Chaminade, C.; Olea, M.; Escobar, C.G. (1999b), Measuring Intangibles: discussion of selected indicators. Autonomous University of Madrid.

Cañibano, L.; Garcia-Ayuso, M.; Sanchez, P.; Olea, M.; (1999c), Measuring Intangibles to Understand and Improve Innovation Management. Preliminary Results. Autonomous University of Madrid.

Chaminade, C. (1999), Case study: Indra. University Autonomous of Madrid.

Cohen, W. and Levinthal, D. (1990), "Absorptive Capacity: A new perspective on learning and innovation", *Administrative Science Quarterly*, Nº 35, pp. 128-152.

Danish Trade and Industry Development Council (1997), Intellectual Capital Accounts. Reporting and Managing Intellectual Capital.

Dosi, G. (1984), Technical Change and Industrial Performance, MacMillan, London.

Ducharme, L.M. (1998), Measuring Intangible Investment: Main Theories and Concepts, Statistics Canada & OECD.

Ericsson (1997), Annual Report.

European Commission (2000), New Cronos, Luxembourg, Eurostat.

Finanzia BBV (1997), Annual Report.

Freeman, C. (1986), (Ed.), Design, Innovation and Long Cycles in Economics Development, St Martin's Press, New York.

Glaser, B. and Strauss, A. (1967), The discovery of grounded theory, Aldine de Gruyter, New York.

Hall, R. (1992), "The Strategic Analysis of Intangible Resources", *Strategic Management Journal*. Nº 13, pp. 135-144.

Indra (1998), Annual Report 1997

----- (1999), Annual Report 1998.

Itami, H. and Roehl, T. (1987), Mobilizing Invisible Assets, Harvard University Press. Cambridge, MA.

Johanson, U. (1999), Mobilising change: Characteristics of intangibles proposed by 11 Swedish firms. School of Business. Stockholm University. Working paper. Mimeo.

Johanson, U.; Eklov, G., Holmgren, M.; Martensson, M. (1999b), Human Resources Costing and Accounting versus the Balance Scorecard: A Literature Survey of Experience with the Concepts. School of Business. Stockholm University. Mimeo.

Johanson, U.; Martensson, M., Skoog, M. (1999a), Measuring and Managing Intangibles. Twelve Swedish Qualitative Exploratory Case Studies. School of Business. Stockholm University. Working Paper. Mimeo.

Kline, S.; Rosenberg, N. (1986), "An overview of innovation", in Landau and Rosenberg (Eds.), The positive sum strategy, National Academy of Sciences, Washington D.C,pp.275-306.

Lunde, T. (1998), Measuring Innovation and Intellectual Capital in Firms. A case study of ELIOP. Master Thesis in ESST. Oct. 1998. Autonomous University of Madrid. Mimeo.

Mincer, J. (1989), Human Capital Responses to Technological Change in the labour Market, NBER Working Paper No. 3207.

Nelson, R. (1959), "The simple economics of basic scientific research", *Journal of Political Economy*, Nº 67, pp. 297-306.

Nelson, R.R. and Winter, S.G. (1982), An Evolutionary Theory of Economic Change, Harvard University Press, Cambridge, MA.

OECD (1996),. Oslo Manual (2nd. Edition), DSTI/STP(96),10.

Pavitt, K. (1984), Sectoral Patterns of Technical Change. Toward a Taxonomy and a Theory, *Research Policy*, Vol 6, Nº 13, pp. 343-373.

Penrose, E.T. (1959), The Theory of the Growth of the Firm, Wiley, New York.

Pralahad, C.K. And Hamel, G. (1990), "The Core Competence of the Corporation", in *Harvard Business Review,* May-June, pp.71-91.

Repsol (1998), Annual Report.

Roos, J. (1996), Intellectual Performance: Exploring an Intellectual Capital System in Small Companies. Paper presented at the "Knowledge in Action!" Conference; Herzlia, Israel, Oct 9-11.

Vickery, G. (1999), "Accounting for Intangibles: Issues and Prospects" *in* Intangibles and Competitiveness: An Empirical Approach, Edward Elgar Publishing.

Walsh, J.P. and Ungson, G.R. (1991), "Organizational Memory", in *Academy of Management Review,* Vol.16, No.1, pp. 57-91

Wernerfeld, B. (1984), "A resource based view of the firm" in *Strategic Management Journal,* Vol 2, Nº 5, pp. 171-180

Zander, U. and Kogut, B. (1995), "Knowledge and the Speed of the Transfer and Imitation of Organizational Capabilities: An Empirical Test" in *Organization Science*. Vol.6, No. 1, January-February, pp. 76-92

---

[i] During the last meeting of the NESTI (National Experts in Science and Technology Indicators) Group of the OECD held in Paris in June 2000, the possibility to eliminate from the Oslo Manual, the word "technological", usually attached to innovation, was discussed. As is well known the Oslo Manual provides the conceptual bases for the innovation studies carried out by EUROSTAT.

[ii] This classification was originally developed by Skandia (1995), a Swedish company of financial services that was the pioneer in disclosing information on intellectual capital as an annex to the financial statements.