CICBS: A METHODOLOGY AND A FRAMEWORK FOR MEASURING AND MANAGING THE INTELLECTUAL CAPITAL OF CITIES - A PRACTICAL APPLICATION IN THE CITY OF MATARÓ

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Abstract

The governments of cities have to make important decisions on the future of their communities. In the past, the vision, objectives, and goals of cities have been determined mainly by considering tangible assets as the main factors of a city's prosperity. However, in the knowledge economy, the role of intangible assets in wealth creation has become fundamental. As a result, an intangible framework of assets that allows navigation from the present reality to the future vision has become an urgent need for all cities. The paper has two well-defined parts. In the first part, the paper develops a specific methodology and framework for measuring and managing the intellectual capital of cities. In the second, the study deals with the practical application of this model of intellectual capital in cities to the specific case of the city of Mataró, providing some details of the first cities' intellectual capital report.

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CICBS CITIES' INTELLECTUAL CAPITAL BENCHMARKING SYSTEM

A methodology and a framework for Measuring and Managing Intellectual Capital of Cities

A practical application in the city of Mataró.

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Practitioner Contribution

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Suggested track:
K Intangible assets and social, intellectual, and cultural capital

The government of cities in the information society

Progress in new technology, especially in information and telecommunications technology, has radically transformed the way people live and work in the information society. In this respect, Edvinsson and Malone (1997, p. 190) have asserted:

> In particular, the combination of powerful communications technologies with equally powerful information technologies will make it possible for people to live and work nearly anywhere and still enjoy most of the fruits of life in a big city or suburbia or the country-side- from culture and arts to role-playing and simulated participation in distant world events … These same technologies will also make work more and

more portable, shifting jobs from centralized work sites (office buildings and factories) to virtual offices located at home or on the road or in neighbourhood centers.

Such changes in the way that people live and work, facilitated by the above-mentioned technologies, inevitably prompt the question: "If we can live and work anywhere, where shall we live and work?". Moreover, these same changes pose important questions for city governments, including the following:

- Which facilities must be offered by city governments if the city is to be the most attractive place in which to live?
- How can innovative companies be attracted to the city?
- How to foster entrepreneurship?
- Which organisational structures are required?
- How the city be transformed to face new technological changes successfully?

These questions and many others of a similar nature transform the dynamic of municipalities, create new challenges, and increase competition. City governments have to make important decisions regarding the future of their communities.

Similar changes have occurred in the past. In the years before the American Civil War of 1861–65, the factory towns of the north-eastern United States (such as Elisabeth, Lowell, Paterson, and Manchester) had established a successful combination of physical and intellectual capital in technology (looms), power (water wheels), employees (northern European immigrants), infrastructure (interchangeable parts), and transportation (canals). But the wealth and power brought by this successful formula did not last. By the beginning of the 1890s, intellectual and financial capital in the form of talent and money had moved to other towns (such as Chicago, St Louis, Pittsburgh, and Detroit) where a new recipe for success was developed. This consisted of new technologies (steam and electricity), new forms of transportation (railroads and, later, trucking), new sources of labour (eastern European immigrants), and a different infrastructure (mass production and bureaucracies) (Edvinsson & Malone 1997).

This historical example demonstrates that the recipe for success changes when there are substantial technological breakthroughs. It is apparent that we are now in that situation again. The equation is again being recast and the balance of forces are again being reset. The new formula will combine new technologies (microprocessor-based

products), transportation (the Internet and broadband telecommunications), labour (the mix of office-goers, telecommuters, 'road warriors', and 'corporate gypsies'), and infrastructure (virtual organisations) (Edvinsson & Malone 1997).

City governments have the difficult task of guiding the transition from the existing formula to the requirements of the new equation. The purpose of this paper is to help these governments in their planning for such a transition by providing them with a new model. This new framework must be especially focused on the management of intangible assets because intellectual capital is now the main source of future wealth, prosperity, and growth.

Measurement and management of cities' intellectual capital: the state of the art

Having established the case for a model to measure and manage the intellectual capital of cities, the question that arises is whether there any proven models for the purpose. The present author is not aware of any. In *Intellectual Capital* (1997, p. 192-193), specifically in the section entitled "The intellectual capital of municipalities", Edvinsson and Malone hinted at the possibility of adapting the IC Navigator model for application in municipalities. The authors note the nature of the IC Navigator:

> … with its mix of the human factor (citizens), customers (the business that support or employ these citizens, as well as those being recruited to come to town), and process (the municipality's mix of city government, schools, police, fire department, and so forth). There is also, of course, the financial factor, which combines the city's budget (including debt or surplus), tax base, and the combined local investment of the area's businesses. Tellingly, what is all but missing in most municipalities is the renewal and development factor. This is due less to the fact that cities and towns don't fit the IC Navigator than that, complacent after a century of predictable change, they have allowed programs to develop these indirect assets to atrophy.

The authors then go on to present a set of "process focus" indicators as a guide to how the general IC Navigator model might be adapted to the specific case of cities.

Apart from this reference in Edvinsson and Malone (1997), the present author is not aware of any significant contributions to the question of the management of the intellectual capital of cities. In contrast, the similar subject of the management of the intellectual capital of *nations* is in a *somewhat* more advanced stage of development. Nick Bontis (2002), in

his work entitled "National Intellectual Capital Index: Intellectual Capital Development in the Arab Region", asserts:

> Although much of the history of intellectual capital literature spans only a decade, the national view of this phenomenon is in its infancy. There have been only two countries that have examined their intellectual capital development: Sweden (Rembe 1999) and Israel (Pasher 1999).

Bontis' (2002) study of the Arab region can be added to this meagre list, and thus represents the third attempt to make a meaningful examination of the intellectual capital development of nations.

These three studies of nations (Rembe 1999; Pasher 1999; Bontis 2002) justify the need to measure and manage the intellectual capital of cities in a similar way. Rembe (1999, p. 4) reported that Sweden offers highly attractive and competitive intellectual capital assets of superior value in the following way:

> Just as corporate investment flows are increasingly determined by the potential of the intellectual capital of companies, international investments will be increasingly determined by the intellectual capital of nations. Traditional statistics are valid in themselves for comparing nations. But today they are hardly enough. Investors must also analyse country-specific "soft" investment data—the data that gives a clear picture of a nation's combined intellectual capital and how it can be utilized for future growth and profits.

Similarly, Pasher (1999, p. 4), in "The Intellectual Capital of State of Israel", made the following observation:

> The assets that have given Israel an advantage over other countries are the hidden intellectual assets. Though Israel is a young country, it is blessed with many intellectual assets. And despite the many political storms it continues to weather, Israel has become a hothouse for some of the most profitable technological ideas. It is well integrated into the international community of technological industries, and is regarded as one of the most important and prominent countries in this field. The country is an important R & D center for international hi-tech companies and has more start-up companies than any other location with the exception of California's Silicon Valley. Since 1982, the number of hi-tech start-up companies in Israel has grown from approximately 50 to over 2000!.

> So far no one has formulated a document presenting Israel's core competencies, key success factors and hidden assets which provide it with comparative advantages and high growth potential.

Similar arguments can be found in Bontis' (2002) report on the Arab countries.

Furthermore, the three reports mentioned above all used the Skandia Navigator model (IC Navigator model) that was initially conceived and applied by Edvinsson and Malone (1997) in the Swedish insurance company Skandia. All three reports translated the company IC model into a country IC model—but the main features of the framework still remained after the translation.

Given that the measurement and management of the intellectual capital of cities has great similarities to that of countries, and given that all three studies previously mentioned used the IC Navigator adapted to countries, this model is discussed below.

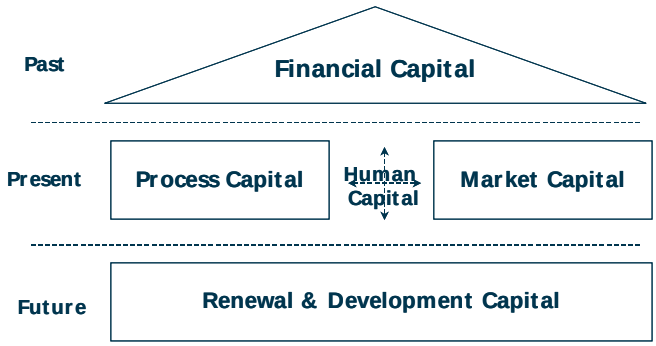

Fig. 1. IC Navigator house metaphor

The IC Navigator model (or Skandia model) provides a balanced and holistic picture of both financial capital and intellectual capital. According to the model, there are four areas of focus with regard to intellectual capital: (i) customer and market capital (in the original model designated for measuring intellectual capital of an organization, customer capital was exchanged for market capital which is used for measuring the intellectual capital of a nation); (ii) process capital; (iii) human capital; and (iv) renewal and development capital. These areas of focus are used as the basis for assessing the intellectual capital within a competitive environment and the IC Navigator model uses the house as a metaphor for the organization or nation, as is shown in Figure 1.

CICBS: A methodology and a framework

Despite the absence of any specific precedent for these matters, the advances made in the management of the intellectual capital of nations can be extrapolated to the case of cities. The design of the new Cities' Intellectual Capital Benchmarking System (CICBS) model that we now describe is heavily dependent on the IC Navigator model for nations, as described above.

CICBS is a new methodology and a new framework for measuring and managing the intellectual capital of cities. Essentially, two approaches can be taken to such a model.

The first approach, which we call 'Cities' General Intellectual Capital Model' is a transversal approach that covers all economic activities of the city or all the economic microclusters by which the economic activities are assembled. The Cities' General Intellectual Capital Model is essentially based on the models for nations developed by Edvinsson and Malone (1997) and Bontis (2002) using the IC Navigator model as described above. This takes in the following phases: vision, core activities, core competencies, indicators, and intellectual capital (IC) categories. These IC categories cover the following: financial capital, human capital, process capital, market capital, and renewal and development capital.

The second approach, which we call 'Cities Specific Intellectual Capital Model' is a longitudinal approach that deals specifically with each city's relevant economic activity or relevant economic microcluster, in a particular and distinctive manner. This model is mainly based on Viedma's ICBS Model (2001a) (2001b) and includes the following phases: vision, segment demand, output, products and services, processes, core competencies, and professional core competencies. Figure 2 gives a general overview of the CICBS Model.

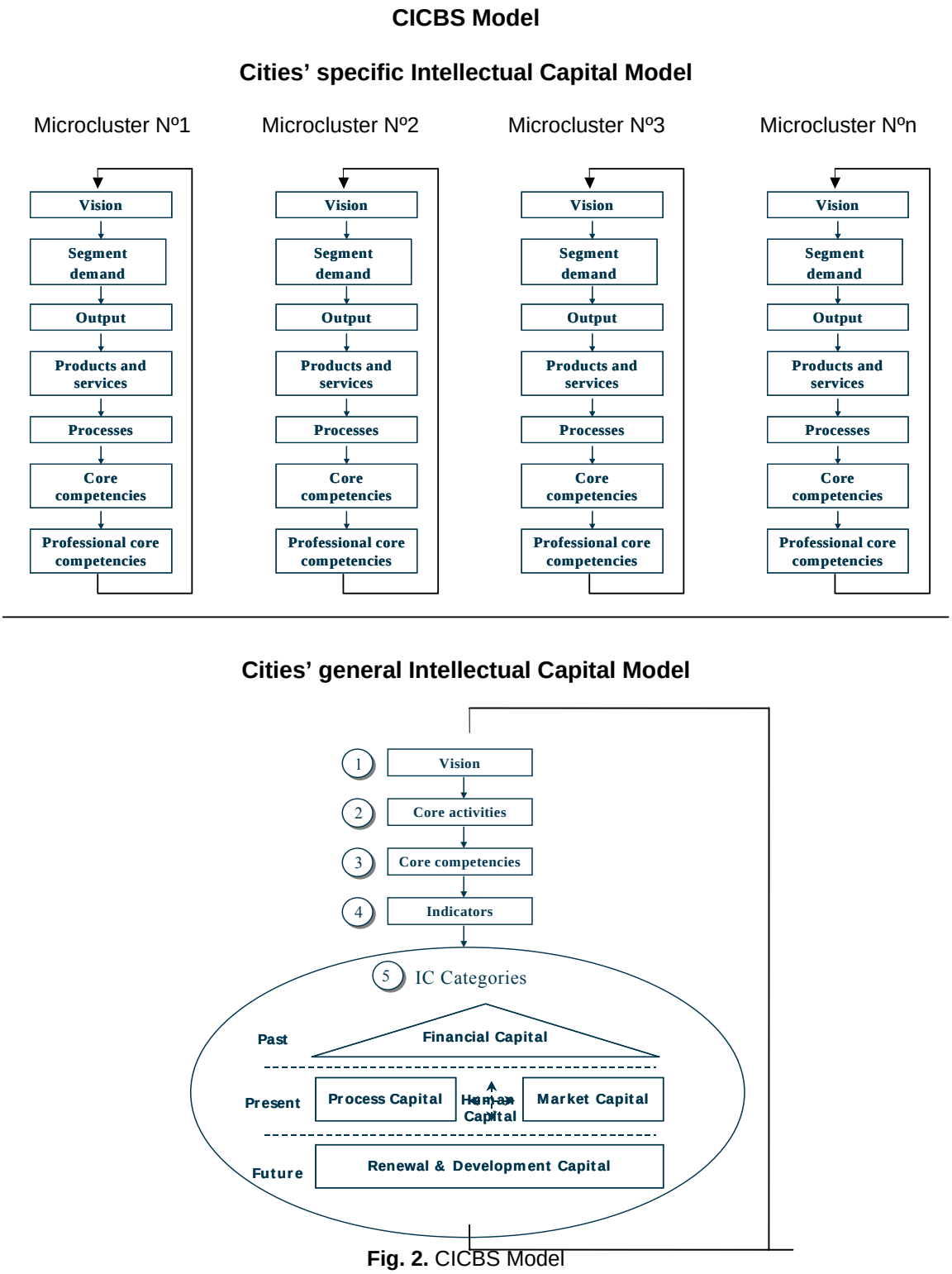

Fig. 2. CICBS Model

These two approaches to the CICBS model are discussed below.

Cities' General Intellectual Capital Model (CGICM)

CGICM is a general model for measuring and managing the intellectual capital of cities that is essentially based on the measurement and management of the intangible assets a city possesses. To develop a set of different economic activities these assets are assembled into what are called *microclusters* according to certain criteria of homogeneity. It is basically about managing the creation and development of a common and general knowledge—an intellectual capital platform—that strengthens the existing microclusters of a city and nurtures the building of new ones.

The process of managing a city's general intellectual capital is based on five phases (Rembe, 1999; Roos et al., 1997):

- Phase 1: Creating the vision
- Phase 2: Identifying the core activities needed to realize the vision
- Phase 3: Identifying the core competencies needed to realize the core activities
- Phase 4: Identifying the indicators for each core activity and each core competence
- Phase 5: Assembling the indicators into different intellectual capital categories

Each phase can be considered as a constituent factor of the CGICM. A summary description of the different phases is given below.

Phase 1: Creating the vision

The vision of a particular city, which we used as the starting point of the process, usually crystallizes through brainstorming and interviews with leading figures in various fields in the city—such as life sciences, social sciences, urban planning, accounting, business management, and so on. It is also important to involve young people in the discussions and ask them what they would like their city to look like in the future, and what would make the city attractive for them. The first step in the process is therefore to understand what the city is, and what the city wants to be. Clear objectives usually make the vision more specific.

Phase 2: Identifying the core activities needed to realize the vision

Once the vision is established, the next step is to identify the actions, projects, and activities that need to be put into practice to reach the vision and objectives previously defined.

Phase 3: Identifying the core competencies needed to realize the core activities

The core activities defined in Phase 2 give way to the core competencies needed to realize the core activities. We assume that core competencies are equivalent to core knowledge and intellectual capital. Such core competencies can be understood as a bundle of intangible assets (Andriessen, 2001).

Phase 4: Identifying the indicators for each core activity and each core competence

Core activities and core competencies are identified in strategic theory as key success factors. As the term implies, key success factors indicate the vital criteria that the particular strategy must meet if it is to succeed. The next logical step is to take the key success factors identified in the previous steps, and identify the indicators that best reflect these key success factors.

Phase 5: Assembling the indicators into different intellectual capital categories

In this phase we assemble the indicators that have been identified in Phase 4 into the different intellectual capital categories of the IC Navigator model discussed previously.

The model for measuring intellectual capital uses the idea of a house as a metaphor for the organization of a city. Financial capital constitutes the roof of the house and reflects the city's history and past achievements. However, it must be noted that these do not necessarily enlighten us in terms of future achievements.

The supporting columns are process capital and market capital—the supports upon which the present operations of the city are based. Renewal and development capital, which is situated in the foundation of the house, measures how the city prepares for the future. Human capital, which is found in the center of the house, interacts with all the different focal points. Human capital is the heart of the city—that is, the capabilities, expertise, and wisdom of the people. It is the role of the city to assist, guide, and support its people towards the realization of their strategic goals.

The city can also be described as a tree. The various means by which the tangible assets are expressed—the annual reports, catalogues, protocols, and others—are represented by the leaves and branches of the tree. The wise investor who desires the fruit

of the tree will examine its roots to learn about its future. The roots of the tree (or the foundation of the house, to mix the metaphor) reflect the renewal and development capital of the city—the source of future growth and affluence.

Based on this essential structure, the diverse focal areas of capital from which the indicators will be assembled, are as follows.

Human capital

Human capital includes knowledge, wisdom, expertise, intuition, and the ability of individuals to realize city tasks and goals. This focus also includes the values of the culture and the philosophy of the city. Human capital is the property of individuals, not the city.

Process capital

Cooperation and the flow of knowledge require structural intellectual assets—that is, information systems, hardware, software, databases, laboratories, an organizational structure, and a management focus—which sustain and amplify the output of human capital. Such structural capital is the capital that remains in the city after the employees go home.

Market capital

The initial model, which was designed to measure the intellectual assets of the organization, relates market capital to customer capital—that is to say, the same assets that are embedded in the relationships with the organization's customers. When we discuss the measurement of a city's intellectual assets, the customers consist of those markets with which the city maintains national and international contacts. Market assets reflect the general assets embedded in a city's relationship with the international market. The assets in this focal point include customer–city loyalty, the satisfaction expressed by strategic customers, the value of brands, and so on.

Renewal and development capital

This reflects the city's capabilities and actual investment in its future development and renewal through the exploitation of its competitive strength in future markets. Renewal and development assets include investments in research and development, patents, trademarks, start-up companies, and the like.

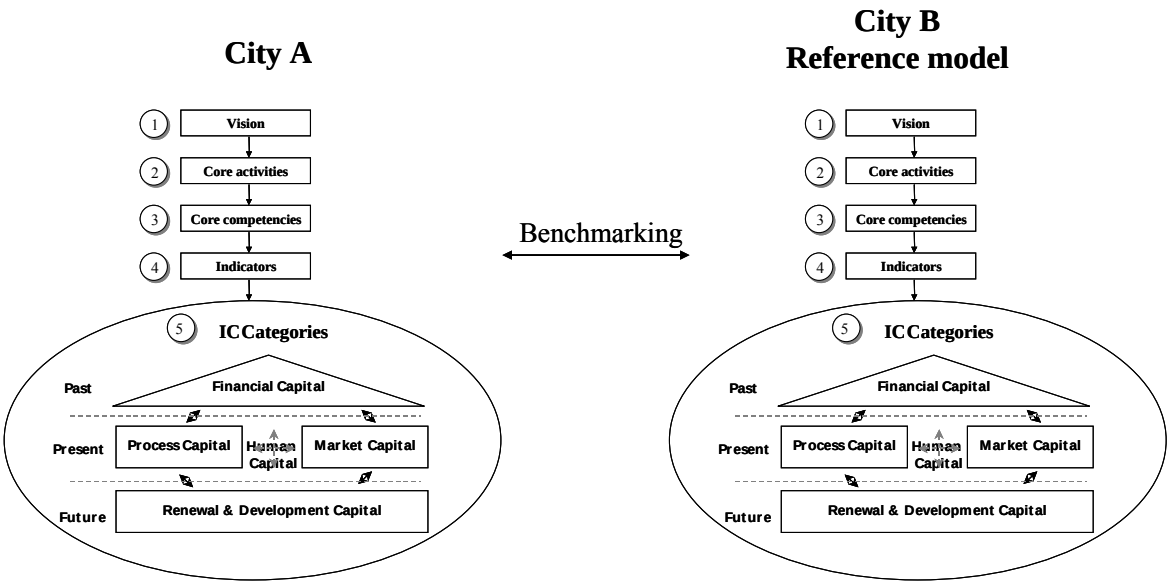

Fig. 3. Cities' General Intellectual Capital Model

After setting up the process of the Cities' General Intellectual Capital Model, there must be an ongoing follow-up process with constant feed-back from the latest phases to the earlier ones, and vice versa. In addition, CGICM methodology facilitates the systematic and repetitive benchmarking of the different items of the whole process with the corresponding items of the world's best city previously chosen as a reference model. Figure 3 shows this process of benchmarking.

Cities' Specific Intellectual Capital Model (CSICM)

The purpose of the CSICM is to measure and manage the intellectual capital of each of the relevant industry microclusters that exist in the geographical area of the municipality. The model is mainly based on the ICBS enterprise methodology (Viedma 2001a; 2001b), which is summarized below.

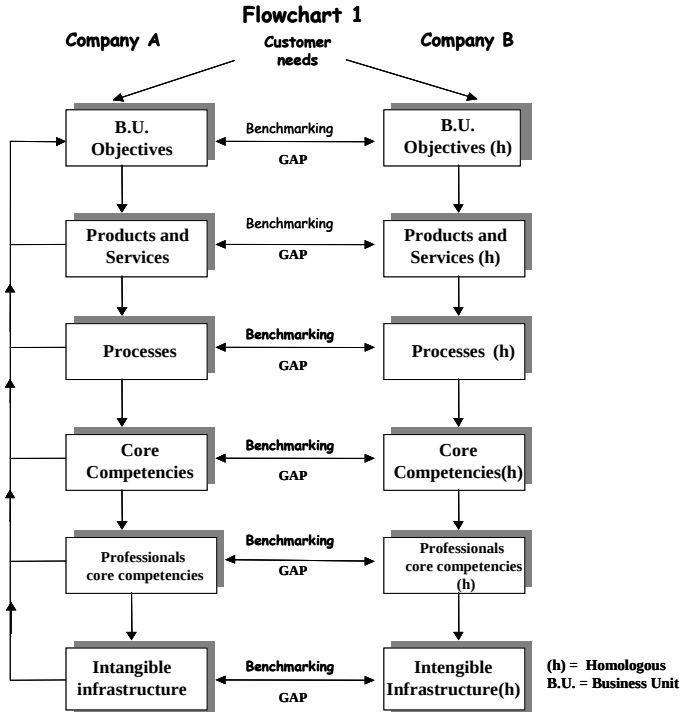

Fig. 4. Intellectual Capital Benchmarking System

A brief description of each flowchart step follows:

- *customer needs:* customer segment needs that the company expects to cover through its business unit activities;
- *business unit objectives:* the ultimate financial and non-financial objectives of the business;
- *products and services:* products and services with their attributes, characteristics, functions, and embedded knowledge and technologies;
- *processes:* innovation and operations value-chain activities that produce products and services—made up of core business activities, outsourcing activities, strategic alliances, and cooperation agreement activities; competitive advantages are generated mainly in the different value-chain core business activities; core competencies are mainly embodied in the core business activities of the value chain*;*

- *company core competencies:* essential knowledge or core competencies that enable competitive advantages, unique processes, and competitive products and services within the business unit;
- *professional competencies:* professionals, managers, and support staff competencies and capabilities that will generate and perfect core competencies;
- *company intangible infrastructure:* infrastructure that the company has for the use of its different business units.

All of the above-mentioned steps have the ultimate purpose of identifying the core knowledge and core technologies that are the prime reasons for sustainable competitive advantages.

The methodology also makes it possible to compare each specific business unit with the corresponding business unit of the best of the competition—thus facilitating the benchmarking of products and services, processes, core competencies and professional core competencies, and intangible infrastructure.

In a similar way to the ICBS enterprise methodology, the Cities' Specific Intellectual Capital Model (CSICM) has been designed as illustrated in Figure 5.

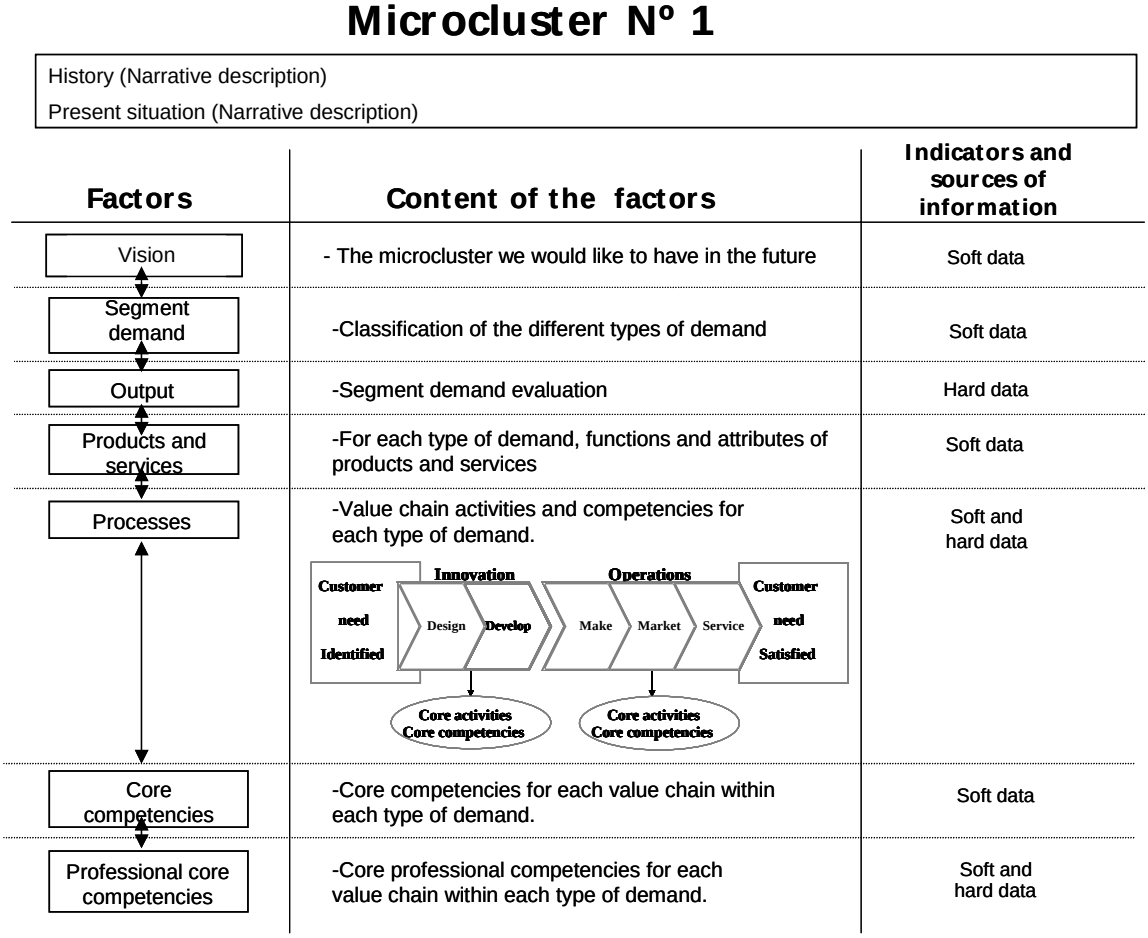

Fig. 5. Cities' Specific Intellectual Capital Model

The discussion now turns to a detailed description of the structure and operation of the CSICM.

First, we must determine the relevant microclusters in a given city and, once they have been identified, apply the CSICM to each of them. For the purposes of the discussion, assume that microcluster No. 1 of Figure 5 is a relevant microcluster of Mataró city. In applying the CSICM to this, the factors that make up that microcluster, and its corresponding contents, are as follows:

- *vision:* future vision about how the city's government wants microcluster No. 1 to be—which is made up of the set of city's companies that are in a similar economic activity;
- *demand segment:* classification of the various demand segments for the products and services of microcluster No. 1;

- *output:* appraisal of the different demand segments of the above factor;
- *products and services:* functions and attributes of products and services evaluated for each corresponding demand segment;
- *processes:* operation and innovation value chains analyzed for each demand segment to identify and value each of the value chains, the core activities, and the competencies that support them;
- *core competencies:* consideration of the competencies that support the core activities of both value chains—core competencies thus being determined for each demand type and value chain through a process of synthesis;
- *professional core competencies:* identification and evaluation of each value chain and demand type, including which professionals are required, and to what extent they make the existence and development of the firm core competencies possible.

The identification of the factors in a specific microcluster is made through primary and secondary information sources. Among the primary sources, questionnaires to the microcluster's firms and experts are especially relevant.

The indicators used to measure and manage the factors are obtained by choosing, from the primary and secondary information sources, the ones that best describe the factors content.

As was the case in the ICBS methodology, if the model is considered as a process, all of the above-mentioned factors or steps also have the ultimate purpose of identifying the core knowledge and core technologies that are the prime reason for the sustainable competitive advantages of the microcluster.

In a similar fashion to that of the ICBS methodology, the model makes it possible to compare each specific microcluster with the corresponding microcluster of the best of competing cities—thus facilitating the benchmarking of vision, segment demand, output, products and services, processes, core competencies, and professional core competencies.

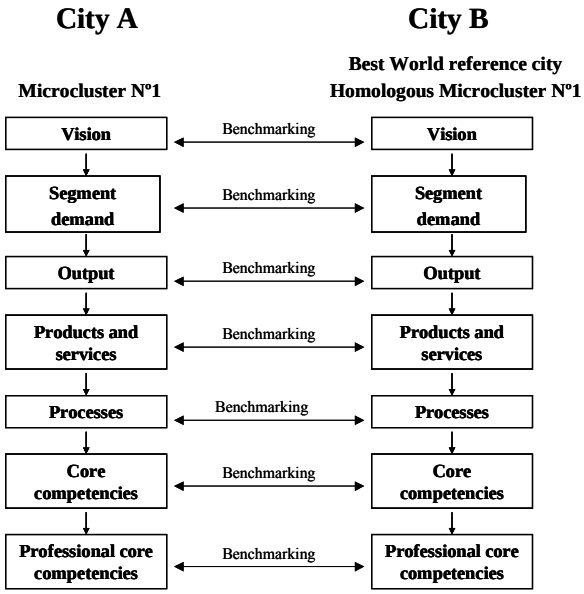

Fig 6. Benchmarking the Specific Intellectual Capital of Cities' Microclusters

Figure 6 depicts the benchmarking process of the specific intellectual capital of cities' microclusters.

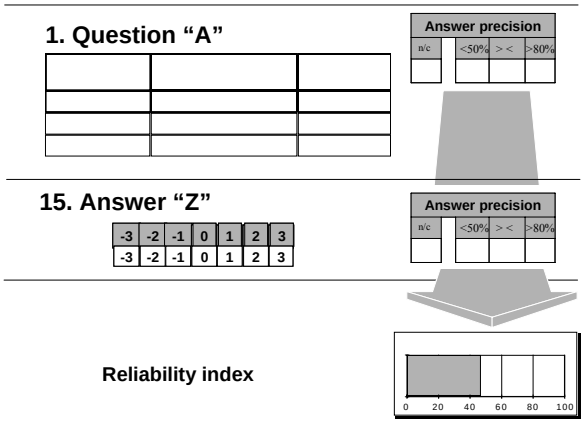

Fig. 7. Reliability Index

Furthermore, given that a large part of the information is based on soft data (especially that of the corresponding microcluster of the benchmarked world's best city), all of the questions in the CSICM questionnaires have a specific response box. By integrating these responses, the CSICM also permits an evaluation of the degree of reliability of the benchmarking and its constituent parts, the establishment of plans for systematically improving information acquisition, and the setting up of a competitive intelligence team in the city. Figure 7 represents the reliability indexes of the questionnaires.

A practical application in the city of Mataró

The city of Mataró is located in the north-east of Spain or, more precisely, in the autonomous community of Catalonia. It has 104,880 inhabitants in a territory of 22.6 square kilometres, and is situated on the coast, in the centre of the so called 'Mediterranean arch'. Only 28 kilometres north of Barcelona, Mataró is part of the metropolitan region of Barcelona, and is the capital of the Maresme region with a population close to 300,000 and a territory of 397 square kilometres. Maresme is an area of high economic and tourist development.

In recent years the government of Mataró has pioneered the development and implementation of several initiatives to foster information and telecommunications technologies in the city and to develop and share the most advanced knowledge in technology and management. These initiatives are rooted in two macroprojects:

- "Master plan for the Information Society in Mataró 1999" (Ajuntament de Mataró, 1999); and
- "Mataró, Knowledge City, January 2002" (Tecnocampus Mataró, 2002).

To put these macroprojects into practice, new institutions have been created (Tecnocampus Mataró), and others already in existence have been strengthened. These latter have included Institut Municipal de Promoció Económica de Mataró (IMPEM), Promoció Urbanistica de Mataró S.A. (PUMSA), Escola Universitaria Politécnica de Mataró (EUPM), and Centre de Tecnologia Empresarial de Mataró-Maresme (CETEMMSA).

These macroprojects are the nearest antecedents of the ICMM project (Intellectual Capital Management of the City of Mataró) that is described in this section.

Therefore, the primary objective of the ICMM project is to finalize and coordinate the different initiatives of Mataró in orientating the city towards the information and knowledge society. The intention is to achieve this through the conception, design, and implementation of a methodology on the measurement and management of the city's intellectual capital. The ICMM project has two clear stages:

- the conception and design of the cities' intellectual capital management model (as described earlier in the present paper); and

- adaptation and implementation of that model to the specific characteristics of the city of Mataró.

This second phase is described below. Before doing so, the present paper describes the "Cities' General Intellectual Capital Model", and follows this with the "Cities' Specific Intellectual Capital Model".

Cities' General Intellectual Capital Model (CGICM)

For the initiation of the Intellectual Capital Platform, which is common to all the relevant economic activities of Mataró city, the available information from the two previously mentioned macroprojects was used, as well as data provided by:

- the observatory of Mataró's information society;
- the Municipal Institute for Economic Promotion.

Taken together, these sources of information have allowed the determination of the content of Phases 1 to 5 of the model. That is, the future vision of the city, the necessary activities and projects to accomplish the vision, the necessary core competencies to carry out the core activities, and the indicators to appraise the activities and competencies have been determined. Then, the excellence of the intellectual capital general platform constructed from the indicators of the city of Mataró are compared with those of cities considered to be more advanced in terms of information and telecommunications technologies and of shared knowledge management. In this specific case, Treviso was chosen as the reference city for benchmarking.

CICBS **Mataró General Intellectual Capital Balance sheet**

DIVISIONS	PREVIOUS PERIOD	PREVIOUS VALUE	PERIOD	VALUE	MEASURE UNIT
FINANCIAL CAPITAL					
GDP (market prices)	1991	817,81	1996	1064,06	Millions of euros
Household's disposable income	1991	6.022,7	1996	8.550,6	euros per capita
GDP per capita	1991	8058	1996	10430	euros
HUMAN CAPITAL					
University/College + secondary studies	1991	17,14%	1996	22,1%	Percentage
Habitual internet users	october-1998	11%	september 2001	27,9%	Percentage
Percentage of qualified workers			1991	26,50%	Percentage
Activity rate	1991	56,98%	1996	55,67%	Percentage
Gini Index	1989	0,387	1994	0,368	Index
PROCESS CAPITAL					
Service sector development					Percentage
Salaried workers in the high knowledge sector (%)			1st quater 2002	37,7%	Percentage
Percentage of firms with internet connection	october-1998	24,1%	september 2001	66,7%	Percentage
MARKET CAPITAL					
Self-containment	1991	79,53%	1996	72,28%	Percentage
Self-sufficiency	1991	81,91%	1996	75,93%	Percentage
Exports/imports ratio			2000	0,68	Ratio
RENOVATION CAPITAL					
Youth rate	1996	16,99%	1 january 2002	14,21%	Percentage
New firms registered for taxation	1997		1r quater 2002	3.382	Firms

Fig. 8. Mataró General Intellectual Capital Balance Sheet

The first abridged balance sheet obtained from "Mataró General Intellectual Capital" is depicted in Figure 8.

Cities' Specific Intellectual Capital Model

For the initiation of the Mataró intellectual capital management specific model, the relevant "industry macroclusters" were first determined, as follows:

- textile (knitwear);
- construction;
- retail trade; and
- education and training.

The identification of the relevant microclusters took into account a large number of indicators. However, special consideration was given to the extent of employment in each case. Given that the textile microcluster turned out to be the most important (with 23% of the working population), the balance of this article refers exclusively to it.

Evaluation of the CSIC model factors was thus made through *ad hoc* questionnaires to experts and companies from the textile microcluster of Mataró city. These questionnaires allowed an identification and evaluation of the factors content. The first

results from the questionnaires allowed a diagnosis of the present state of the CSIC model factors—that is, the "demand segment", the "output", the "products and services", the "processes", the "core competencies", and the "professional core competencies". These first results from the questionnaires were then compared with corresponding results for the city of Treviso (Italy)—as it is considered to be the key center of one of the world's most important textile knitwear microclusters.

CICBS **Mataró General Intellectual Capital Balance sheet.**
Human Capital detail

DIVISIONS	PREVIOUS PERIOD	PREVIOUS VALUE	PERIOD	VALUE	MEASURE UNIT
HUMAN CAPITAL					
University/College + secondary studies	1991	17,14%	1996	22,1%	Percentage
Continous education (adult participation rate)					
Illiteracy rate	1991	6,34%	1996	4,73%	Percentage
Habitual computer users	october-1998	nd	september 2001	43,7%	Percentage
Habitual internet users	october-1998	11%	september 2001	27,9%	Percentage
Life expectancy	1999-1995	79,65	2001-1997	80,12	Years
Percentage of qualified workers			1991	26,50%	Percentage
Activity rate	1991	56,98%	1996	55,67%	Percentage
Activity rate. Men	1991	71,71%	1996	68,87%	Percentage
Activity rate. Women	1991	43,11%	1996	43,14%	Percentage
Activity rate. Young. 15-24	1991	61,17%	1996	53,82%	Percentage
Activity rate. Adults. 25-54	1991		1996		Percentage
Activity rate. Adults. 55-64	1991		1996		Percentage
Library visits			2000	280.040	People
Cultural entities and organizations	1999	189	2000	203	Number of entities
Cinema capacity /1000 inInhabitants	1999	36,82	2001	32,91	Seats / 1.000 inhab.
Theatre capacity/1000 inInhabitants	1999	7,78	2001	7,52	Seats / 1.000 inhab.
Cultural entities/ 1000 Inhabitants	1999	1,80	2000	1,92	Entities / 1.000 inhab.
Abstencions rate over the total electoral roll	1996	21,16%	marzo 2000	33,7%	Percentage
Gini Index	1989	0,387	1994	0,368	Index
People receiving poverty subsidy	1999	296	2002	236	People
Registered unemployment rate					Percentage
Female unemployment rate					Percentage

Fig. 9. Mataró Specific Intellectual Capital Balance Sheet

CICBS **Mataro Specific Intellectual Capital Balance Sheet**

Factors	Mataró	Treviso	Mataró										Treviso									
Employees per firm			10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
1 a 5	2	1																				
5 a 10	2	1																				
10 a 25	3	3																				
25 a 50	2	4																				
50 a 100	1	1																				
100 o >	1	1																				
Accuracy level	**82%**	**50%**																				
Demand type			10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
Final consumer	1	2																				
Distributors	2	4																				
Departamental Stores	2	1																				
Other textile producers	2	1																				
Own stores	1	2																				
Multibrand stores	3	2																				
Accuracy level	**80%**	**50%**																				
Products and services			10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
Quality	7	8																				
Price	6	9																				
Fashion	6	9																				
Accuracy level	**70%**	**50%**																				
Innovation			10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
In the product	7	9																				
In the process	6	8																				
Accuracy level	**80%**	**50%**																				
Processes			10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
Spinning	2	0																				
Finishing	1	0																				
Design	5	8																				
Wearing	5	2																				
Marketing and distribution	4	8																				
Accuracy level	**80%**	**50%**																				
Product type			10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
Men's underwear	1	0																				
Women's underwear	1	0																				
Men´s outwear	2	8																				
Women´s outwear	3	9																				
Children	2	2																				
Sport	1	1																				
Accuracy level	**76%**	**50%**																				
Distribution channels			10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
Own stores	1	2																				
Franchises	1	2																				
Salesmen	2	8																				
Representatives	6	9																				
Accuracy level	**76%**	**50%**																				
Core competencies			10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
Own brand development	5	8																				
Outsourcing degree	5	7																				
Local outsourcing degree	8	4																				
Labour force qualification	5	7																				
Export potential	4	7																				
IT use	5	7																				
Technological development	4	6																				
Institutional frame	7	8																				
Accuracy level	**81%**	**50%**																				
Total accuracy level	**78%**	**50%**																				

Fig. 10. Mataró Specific Intellectual Capital Balance Sheet.

The first abridged balance sheet obtained from "Mataró Specific Intellectual Capital" is depicted in Figure 9 and 10.

Conclusions

City governments have to make important decisions on the future of their communities. In the past, the vision, objectives, and goals of cities have been determined mainly by considering tangible assets as the main factors in determining prosperity. However, in the knowledge economy, the role of intangible assets in wealth creation has become fundamental. As a result, some local communities have initiated strategic plans to develop new information technologies and collective knowledge.

However, these plans all lack coordination and continuity. More significantly, they lack an intangible assets framework that allows navigation from the present situation to the future vision of the city.

To fill this gap the present paper has presented a model and a framework especially developed for measuring and managing the intellectual capital of cities. The theoretical background and foundations of the model have been carefully explained. Essentially, the City's Intellectual Capital Model has two different approaches. The first approach—Cities' General Intellectual Capital Model—is a transversal approach that covers all economic activities of the city and is mainly based on the nations' Navigator model of Edvinsson and Malone (1997) and Bontis (2002). The second approach—Cities' Specific Intellectual Capital Model—is a longitudinal approach that deals specifically with each city's relevant economic activity or relevant economic microcluster. The Cities' Specific Intellectual Capital Model is mainly based on Viedma's (2001a; 2001b) ICBS Model. Both approaches use benchmarking techniques when building the future vision of the city, and the process of benchmarking is carried out using the world's best cities as reference models.

After the presentation of the models, the paper has dealt with the practical application of the Cities' Intellectual Capital Model to the city of Mataró, and has given the broad lines of the main steps of the implementation process, together with details of the first cities' intellectual capital report.

In presenting this pioneering effort, it is hoped that new productive research on managing intangibles in municipalities will be encouraged.

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