

# A NEW MODEL TO MEASURE AND MANAGE INTELLECTUAL CAPITAL

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### Abstract

Literature provides several intellectual capital models. Nevertheless, the need for adapting theoretical models to the new social and economic trends justifies an effort in improving previous proposals. Taking into account the main contributions in the field, the Intellectus Knowledge Forum presents to the international scientific and professional community a new model to better understanding the role of different expressions of organizational knowledge. The main contributions of the Intellectus Model are: a) reference to five components of intellectual capital; human capital, organizational capital, technological capital, business capital, and social capital; b) the implementation of several principles which facilitate the management of intangible activities; and c) an internal logic, which explains the combination of relationships defining the entire system through several concepts such as intellectual capital components, elements, variables, and indicators.

**Keywords:** Intellectual Capital, Human Capital, Organizational Capital, Relational Capital, Measurement Model.

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**Abstract:** Literature provides several intellectual capital models. Nevertheless, the need for adapting theoretical models to the new social and economic trends justifies an effort in improving previous proposals. Taking into account the main contributions in the field, the Intellectus Knowledge Forum presents to the international scientific and professional community a new model to better understanding the role of different expressions of organizational knowledge. The main contributions of the Intellectus Model are: a) reference to five components of intellectual capital; human capital, organizational capital, technological capital, business capital, and social capital; b) the implementation of several principles which facilitate the management of intangible activities; and c) an internal logic, which explains the combination of relationships defining the entire system through several concepts such as intellectual capital components, elements, variables, and indicators.

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# **A NEW MODEL TO MEASURE AND MANAGE INTELLECTUAL CAPITAL**

## **1. INTRODUCTION**

More than a decade has passed since the publication of the first proposal about the concept of measuring and managing the intellectual capital. In 2003, the Intellectus Knowledge Forum of the University Institute of Business Administration presents to the international scientific and professional community a new model to better understanding the role of different expressions of organizational knowledge in value-creation process.

The main contributions of the Intellectus Model are described as follows. First of all, it makes reference to the five components which compose intellectual capital: human capital, organizational capital, technological capital, business capital, and social capital. Secondly, the model includes the implementation of several principles which facilitate the management of intangible activities. In this sense, the model can be considered as an open one because it presents a structure related with the agents of knowledge which are integrated with the surrounding of the organization. Notwithstanding, the model tries the establishment of some homogeneous elements in order to compare firms. The Intellectus model is dynamic because it tries to show the role of the temporal evolution in terms of intangibles assets and how this evolution explains the way in which firms adapt their strategies in order to create and sustain competitive advantages. Facing several models defining an independent intellectual capital component, named as innovation, learning, or renewal capital (i.e. Kaplan & Norton, 1996; Edvinsson y Malone, 1997; Camisón, Palacios y Devece, 2000), the Intellectus Model includes some elements, and variables related to this dynamic aspects that report more complete information concerning the way in which firms evolve and the necessary decisions to do it efficiently.

Finally, the third contribution refers to its internal logic, which explains the combination of relationships defining the entire system through several concepts such as intellectual capital components, elements, variables, and indicators. This internal logic attempts to explain the connectedness which exists among the capitals. Once defined the five components of intellectual capital, the model define the main elements–homogenous groups of intangible assets of each component of intellectual capital–, variables –intangible assets integrated within an element–, and indicators –instruments

for the valuation of intangible assets of organizations expressed in different units of measurement—.

## **2. GENERAL FRAMEWORK**

As we previously highlighted, literature provides us several intellectual capital models. Nevertheless, the need for adapting theoretical models to the new social and economic trends justifies our effort in improving previous proposals. Taking into account the main models (i.e. Kaplan & Norton, 1992; Bontis, 1996; Brooking, 1996; Saint Onge, 1996; Edvinsson & Malone, 1997; Sveiby, 1997; Atkinson *et al.*, 1998; Stewart, 1998; Viedma, 2001), the Intellectus Model uses as direct predecessor the Intellect one (Euroforum, 1998), which just distinguishes three intellectual capital components: human capital, structural capital, and relational capital. At international level it is accepted that this three basic components of intellectual capital the ones that represent, in a wide sense, all expressions of firm's knowledge. This triple nature of intellectual assets is being revised by different lines of investigation which are trying to reconcile the concept of intellectual capital.

Human capital component makes reference to the knowledge which groups or people possess, as well as their ability to generate and reinforce it; therefore, human capital is made up of that which people and groups know and by the capacity to learn and share this knowledge. Within human capital we consider as elements: 1) values and attitudes – knowledge about the incipient sources which lead individuals to do things—; 2) aptitudes –knowledge which people have about things, to successfully carry out a task—, and 3) capacities or *know-how* –knowledge related to the way workers do things based on their own experience and practice.

Structural capital is the combination of knowledge and intangible assets derived from the processes of action which are property of the organization and which remain in it. Brooking (1996) & Bueno (2001) are some of the first contributions that recognize the interest of distinguishing between organizational key aspects and the necessary technological competences to develop o renew products or processes. This distinction has as its remote ancestors Freeman (1974), Giget (1984), and Porter (1985) who show the relevance of technology in the value chain of organizations. As we will see, this new perspective has been assumed by the Intellectus Model proposal.

On the one hand, organizational capital refers to the combination of intangibles that are, formal as well as informal, which structure and develop organizational activity of the firm effective and efficiently. As the main elements we define: 1) culture –a

combination of values, norms, and ways of behaviour which are assumed and shared by the majority of the people–, 2) structure –formal organization modes and processes–, 3) organizational learning – the capacity to acquire new competencies in order to respond to the dynamics of change and organizational development–, and 4) processes – combination of activities which make up the organizational operations whether directed to internal customers, external customers, and suppliers.

On the other hand, technological capital refers to the combination of intangibles directly linked to the development of the activities and functions of the technical systems of operations, responsible for obtaining products with a series of specific attributes. Technological capital is composed of four basic elements: 1) R&D&i –efforts made in technological innovation processes–, 2) technological infrastructure – combination of knowledge, methods, and techniques which the organization incorporates into its processes–, 3) intellectual and industrial property –volume of legally protected knowledge which grants the company which created it the exclusive right to its exploitation in a predetermined time and area–, and 4) results of innovation – improvements incorporated into existing products, processes, and management methods, perceived in terms of costs, quality, output level and the like.

Finally, the heterogeneity of external agents recommends the explicit distinction between business capital and social capital, both included in the relational capital component as can be seen in Euroforum (1998), Bueno (2001), or in the customer capital (Bontis, 1996; Stewart, 1997). Business capital refers to the value to the organization of the relationships which it maintains with the main agents connected with its basic business process. Within this component, the model identifies the following elements: 1) relationships with customers –relationships with different segments of customers who demand or could demand the products which make up the basic business process of the entity–, 2) relationships with suppliers –relationships with different suppliers of the necessary resources for the basic business process–, 3) relationships with shareholders, institutions, and investors –relationships maintained with the shareholders, institutions, and investors which make up the market in which the organization operates– 4) relationships with allies –collaboration agreements which the organization maintains with a certain level of intensity, continuity, and structure with other institutions–, 5) relationships with competitors –existing relationships with other competitors in the same industry as well as in related ones– , and 6) relationships with quality improvement and promotion institutions –those that the institution maintains

with the aim of improving this key issues in its processes, products as well as in managing the entire company–.

Social capital refers to the value to the organization of the relationships which it maintains with other social agents in its surroundings, expressed in terms of level of integration, commitment, co-operation, cohesion, connection, and social responsibility. Social capital is composed of these following basic elements: 1) relationships with public administration –interactions with the institutional apparatus which try to objectively promote the general interest of society–, 2) relationships with the media and corporate image –relationships with the institution maintains with the mass media to create the profile of the brand as well as the reputation and name of the company–, 3) relationships with environmental protection –preservation of the natural environment and promotion of ecological initiatives–, 4) social relationships –relationships with trade union organizations, institutions in the labour market, leading to the creation, job quality and stability of employment–, and 5) corporate reputation.

Notwithstanding, in current scientific and professional meetings about the value of intangibles, the introduction of the idea of cultural capital is being observed (Bueno, Medellin and Morcillo, 2003). This new perspective could be a future subject for consideration by the Intellectus Model, once it has been validated for its organizational application.

### **3. THE INTELLECTUS MODEL**

The Intellectus Model is based on a series of principles with a conceptual focus. These principles allows its interpretation, operative capacity, and its potential to be adapted to different necessities of organizations which wish to measure their intellectual capital and give and adequate overview to interested social agents. The main characteristics of the model we consider are: systematic, open, dynamic, flexible, adaptive and innovative.

The model is **systematic** because it offers and interrelated and complete structure of the five aspects which represent the main components or sub-systems which make up the explanatory elements and variables of the intangible or intellectual assets. The model is **open** due to the fact that it presents a structure related to the agents of knowledge which are integrated with the surroundings of the organization. This principle offers, in short, a double perspective of the model, the internal perspective based on values which we represent as included in the human and organizational capital,

and the external based on those which show included in the business and social capital. Technological capital acts as an interface between both perspectives, allowing technical relationships which link the endogenous vision with the exogenous, keeping in mind the work and design evidence of the organization “on-line”.

The **dynamic** character of the model derive from the fact that it tries to offer a combination of elements, variables, indicators, and relationships which should allow the observation of its temporal evolution, with the objective of achieving an improvement in the management of the intangible activities and a greater value for the components of the intellectual capital of the organization. The fundamental aspect to achieve the desired dynamism is the incorporation of the “multiplying factor” which represents the combination of guidelines to orient the management of the intangible towards a determined strategy.

The **adaptive** character of the model is related to the preceding principle, as this flexibility obliges every organization to adapt the current proposal to its requirements, elements, and variables as well as to its indicators, which can appear in various ways. Finally, the model is **innovative** with respect to the main intellectual initiatives which gave arisen up to the present moment. This novel character becomes clear when comparisons are made with other models which are known and applied in the international sphere, as well as for the virtuous combination of the preceding principles.

In short, the internal logic of the model attempts to explain the connectedness or basic interdependence which exists between the capitals, projecting itself onto the combination of relationships which link-up their principal elements. These relationships allow the integration of the model’s structure, revealing its levels of adaptation to the necessities and intangible criteria of each organization, and defining the possibly uncertain borders of each capital.

### **3.1. Development of the model**

From the general definitions previously commented, we develop more specific definitions about the main elements of each intellectual capital component.

#### **3.1.1. HUMAN CAPITAL**

Within human capital we can consider as elements:

1. **Values and attitudes:** represent knowledge about the incipient sources which lead individuals to do things. This knowledge, which refers mainly to a person's mental model, conditions the perception of the world which individuals have. This element is composed by several variables:
  - Feeling of belonging and commitment
  - Self motivation
  - Satisfaction
  - Sociability
  - Flexibility and adaptability
  - Creativity
  
2. **Aptitudes:** makes reference to the knowledge which people have about things, to successfully carry out a task or their job. As variables subject to measurement, we highlighted:
  - Formal education
  - Specialised training
  - Experience
  - Personal development
  
3. **Capacities (know-how):** refers to the type of knowledge related to the way of doing things. Specifically, the utilities, dexterity, and talent which a person develops basically as a fruit of his/her experience and practice are considered capacities; as variables:
  - Learning
  - Collaboration
  - Communication
  - Leadership

### 3.1.2. STRUCTURAL CAPITAL

As we considered this intellectual capital component was constituted by two elements: organizational capital and technological capital

#### 3.1.2.1. Organizational capital

From the general definition of organization capital, these elements can be derived:

1. **Culture:** combination of values, norms, and ways of behaviour which are assumed and shared by the majority of the people in the organization and which condition their behaviour and the corporate success. It is subject to the following variables that can be measured:
  - Cultural homogeneity
  - Evolution of cultural values
  - Social climate
  - Business philosophy
  
2. **Structure:** modes and processes of formal organization of the company. This is composed of the following variables which are subject of measurement:
  - Organizational design
  - Organizational development
  
3. **Organizational learning:** capacity of the organization to acquire new competencies and knowledge with the aim of responding to the dynamics of change and organizational development
  - Learning environments
  - Organizational guidelines
  - Capture and transmission of knowledge
  - Creation and development of knowledge
  
4. **Processes (towards internal and external customers and suppliers):** combination of activities which make up the organizational operations whether directed to internal or external customers or suppliers. From the organization's value chain, the most relevant processes (logistics, technical, administrative, commercial, etc.) are determined for the development of its activities.
  - **Towards the internal customer**
    - i. Strategic reflection processes
    - ii. Innovation
  - **Towards the external customer**
    - i. Customer segmentation systems
    - ii. Customer management policies

- **Towards the suppliers**
  - i. Supplier integration
  - ii. Supplier management policies

### 3.1.2.2. Technological capital

Within this intellectual capital component, we define the following elements:

1. **Effort in R+D+I:** research (R) is understood to be the carrying out of creative tasks which function in a systematic way with the goal of increasing the volume of knowledge about reality. Development (D) is the incorporation of this knowledge to conceive new applications. Finally, innovation (I) is composed of the efforts dedicated to design, launch and spread of technologically new goods and services among the public. Is composed of the following variables:
  - Expenditure on R+D+I
  - Personnel in R+D+I
  - Projects of R+D+I
2. **Technological infrastructure:** combination of knowledge, methods, and techniques which the organization incorporates into its processes so that they are more efficient and effective, not included in the previous element but accumulated through external sources:
  - Purchase of technology
  - Infrastructure of production technologies
  - Infrastructure of information and communication technologies
3. **Intellectual and industrial property:** volume of legally protected knowledge which grants the company which created it the exclusive right to its exploitation in a predetermined area.
  - Patents and prototypes
  - Registered trademarks
  - Licences
  - Industrial secrets
  - Internet domain names (similar than trademarks)
4. **Results of innovation:** improvements incorporated in existing products, processes, and management methods, perceived in terms of costs, quality,

output, and time. This element includes achievements obtained through the launch of new products.

- Product innovation
- Process innovation
- Management innovation
- Social innovation

### 3.1.3. RELATIONAL CAPITAL

As we considered this intellectual capital component was constituted by two elements: business capital and social capital

#### 3.1.3.1. Business capital

As we stated, it refers to the value of the organization of the relationships which it maintains with the main agents connected with its basic business process. Is composed of six basic elements:

1. **Relationships with external customers:** relationships with different segments of external customers who demand or could demand the goods or services which make up the basic business process of the entity.
  - Relevant external customer base
  - External customer loyalty
  - External customer satisfaction
  - External relationship processes
  - Distribution network
2. **Relationships with suppliers:** relationships with different suppliers of resources necessary for the basic business process of the entity. As the main variables:
  - Formalization of supplier relationships
  - Technological support
  - Personalization of products and services
  - Suppliers' response capacity
3. **Relationships with shareholders, institutions, and investors:** relationships maintained with the shareholders, institutions and investors which make up the market in which the organization operates
  - Relationships with shareholders and institutional investors

- Relationships with market institutions
  - Business participation relationships
4. **Relationships with allies:** Collaboration agreements which the organization maintains with a certain level of intensity, continuity, and structure with other institutions.
    - Allie base
    - Solidity of the alliances
    - Benefits of the alliances
  5. **Relationships with competitors:** existing relationships with other competitors in the same industry as well as in related sectors.
    - Knowledge of competitors
    - Relationships processes with competitors
  6. **Relationships with quality improvement and promotion institutions:** relationships which the firm maintains with quality promotion and improvement institutions, with the aim of improving this one in its processes, products, and services as well as in the management company.
    - Relationships with quality improvement
    - Certification and quality systems

#### 3.1.3.2. Social capital

As we pointed out, social capital refers to the value to the organization of the relationships which it maintains with other social agents in its surrounding, expressed in terms of level of integration, commitment, co-operation, cohesion, connection, an social responsibility which it wishes to establish with society. As elements, we stated:

1. **Relationships with public administration:** interaction with the institutional apparatus which tries to objectively promote the general interests of society.
  - Co-operation with public administration
  - Participation in public management
2. **Relationships with the media and corporate image:** relationships which the institution maintains with the mass media to increase the profile of the brand as well as the reputation an name of the company.
  - Trade mark recognition

- Relationships with the media
3. **Relationships with environmental protection:** preservation of the natural environment and promotion of ecological initiatives.
    - Relationships with environmental protection institutions
    - Environmental codes and certifications
  4. **Social relationships:** relationships with trade union organizations, institutions in the labour market, leading to the creation, job-quality, and stability of employment.
    - Relationships with trade unions
    - Relationships with labour market institutions
  5. **Corporate reputation:** relationships which the organization maintains with different social agents (markets, institutions, citizens, and external consumers) as well as the actions which lead to a favourable social perception.
    - Codes of organizational behaviour
    - Corporate governance code
    - Social action
      - i. Relationships for the defence and protection of artistic and cultural heritage
      - ii. Relationships for the economic development of the surroundings in which operates.
      - iii. Relationships for social solidarity and cohesion and which help the social integration of the disable and citizens who are subject to discrimination
      - iv. Relationships for the technological and scientific development of the social surroundings in which the organization acts.
      - v. Relationships with the consumer protection organizations.

#### **4. FINAL REMARKS**

Once the generic version of the Intellectus Model was finished the necessity to increase its practical usefulness is evident, developing some specific applications and singular adaptations. Although the structure of the mode, its principles, internal logic, and definitions undoubtedly constitute a referential framework sufficiently wide to be

applied to a large number of diverse organizations, it shouldn't be overlooked that its orientation is directed towards institutions which are subject to competitive environments.

Furthermore, there are another fields where the model could be applicable, though some adaptations should be done in function of the terminology and the characteristics of the sector. In this sense, the Knowledge Society Research Centre is developing an important research activity to carry out a fundamental validation of the model with diverse agents and from different perspectives. For instance, in current scientific and professional meetings about the value of intangibles, the introduction of the idea of cultural capital is being observed (Bueno, Medellin and Morcillo, 2003). This new perspective could be a future subject for consideration by the Intellectus Model, once it has been validated for its organizational application.

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