Relevance of Value Management Indicators Based on Intellectual Capital for the Colombian Shipbuilding Sector

Freddy Mestre Gómez[1], Carlos Eduardo Castaño Ríos[2], Jair Albeiro Osorio Agudelo[3], Oscar Torres Yarzagaray[4]

[1] [Universidad de Cartagena, Colombia], ORCID: https://orcid.org/0000-0002-0037-0189
PhD Student in Business Administration at **Universidad de Cartagena**.
[2] [Universidad de Antioquia, Colombia, ORCID: https://orcid.org/0000-0003-4117-0375
[3] [Universidad de Antioquia, Colombia], ORCID: https://orcid.org/0000-0002-5745-9715
[4] [Universidad de Cartagena, Colombia], ORCID: https://orcid.org/0000-0001-6108-0401
Economist from **Universidad de Cartagena**. Master's Degree in Logistics from **Escuela Naval de Oficiales Almirante Padilla**. Master's Degree in Organizational Management from **Universidad EAN**. PhD in Economic Sciences from **Universidad del Zulia**.

ABSTRACT.
The Colombian shipbuilding sector, particularly in Cartagena de Indias, is characterized by high specialization in knowledge management, competitiveness, and productivity, driven by intellectual capital (IC) and technological innovation. Comprising 35 shipyards —five internationally certified—, it significantly contributes to foreign trade, defense, and strategic sectors such as petrochemical and logistics. Since 2013, it has achieved a 61.3% growth in exports, generating annual revenues between USD 15 and 30 million and providing specialized employment. The 2030 Agenda envisions Colombia as a bi-oceanic power, requiring innovations and investments to serve larger vessels.
IC, defined as the value of organizational knowledge, encompasses human, structural, and relational capital. Its effective management involves capturing, storing, transferring, and strategically applying knowledge. From pioneering models such as Sveiby (1986) to approaches like Skandia Navigator and Balanced Scorecard, various methodologies have been developed to measure and manage IC, though many lack clear indicators. Recent proposals suggest logical–methodological frameworks adapted to sectoral contexts.
Studies show a positive correlation between IC and financial performance, as well as the need to include social and environmental dimensions in public sectors. International research, such as in 322 Malaysian organizations, confirms that knowledge management infrastructure and processes, mediated by institutional accounting practices, significantly impact organizational performance. Strategically integrating IC management with accounting tools and innovation is essential to maximizing its value in the sector.
Keywords: intellectual capital, shipyards, competitiveness, knowledge management, innovation.

INTRODUCTION

The shipyard sector of Colombia has a high level of specialization in knowledge management compared to other economic sectors, in addition to its high potential in productive linkages, alliances with other sectors such as petrochemical - plastic, it is a support for foreign trade, the logistics sector and the defense sector of the country; which represents 19 million dollars in linkages from 6 regions of the country and 35 shipyards at the country level, of which 5 are

internationally certified. It is also characterized by concentrating a high level of competitiveness and productivity, protected by the participation of intellectual capital, the insertion of technological innovations and differentiated comparative aspects with which Colombia and in particular the city of Cartagena de Indias has; among which the climate, deep bay and is considered a hub port for Latin America and the Caribbean due to its geographical location stand out.

Regarding the level of competitiveness and productivity of the sector measured in man hours versus capital goods produced or repaired, there is 100% compliance compared to countries such as the US, China and Germany; which are linked to important economic blocs such as the Organization for Economic Cooperation and Development (OECD) and BRIC (acronym for the countries of Brazil, Russia, India, China and South Africa). (Gobierno de Colombia, 2022)

According to figures provided by the Government of Colombia, since 2013 the sector has been experiencing a growth in exports of 61.3%, generating revenues between 15 and 30 million dollars, in addition to providing intensive and specialized employment at the same time for the city of Cartagena, which has an economically active population of 474,414 people in 2021.(Camara de Comercio de Cartagena, 2022)

This level of compliance has placed Colombia in the spotlight of the whole world in the last 30 years because shipowners of all nationalities prefer to carry out maintenance on their ships and ships in the city of Cartagena de Indias, as the most strategic in Colombia in this economic sector. Likewise, the construction of sports, military, commercial and other ships for maritime and river transport is concentrated in the Shipyard sector of the City of Cartagena.

For the 2030 Agenda, Colombia has the goal of being a bioceanic power (Conpes 3990), leveraged in the shipbuilding sector that has as a great challenge to include a greater number of innovations and investments to serve larger ships associated with the growth of foreign trade, which requires larger vessels.(Caro, Soraya, 2021)

REVIEW OF THE LITERATURE

IQ is the value of the knowledge you have of a company or organization's employees, their skills, business training, or any proprietary information that can give the company a competitive advantage. This is made up of 3 main elements: (Bravo & Sánchez, 2022)

- Human Capital: comprises the knowledge, skills, experience, and ability of employees to perform tasks.
- Structural Capital: includes the systems, processes, databases, and organizational culture that allow knowledge to be encoded, stored, and shared.
- Relational Capital: these are the relationships with customers, suppliers, partners and other external agents.

Knowledge management in organizational development

This has been consolidated as a critical organizational function for sustainable development and value formation; It encompasses the set of systematic processes that allow identifying, capturing, developing, sharing and applying relevant knowledge within an organization in order to improve its performance, foster innovation and achieve its objectives. (Valbuena & Sánchez, 2024)

In knowledge-intensive contexts such as scientific corporations, technology is not only oriented to continuous improvement, but also to ensuring technological sovereignty, the

transfer of critical capabilities and the retention of strategic knowledge; in these contexts, KM is not limited only to document management, it integrates processes such as organizational learning, the creation of communities of practice, talent management, the codification of expert knowledge, and the design of organizational structures that favor the flow of tacit and explicit knowledge. (Villasana et al., 2021)

For KM to be applied correctly in organizations, it must be structured in 4 fundamental processes: (Perdomo, 2023)

1. Knowledge capture: refers to the identification and collection of critical knowledge, both tacit (experience, intuitions, skills) and explicit (documents, manuals, databases); as far as shipyards are concerned, this would include the systematization of learning derived from naval projects, technological tests, field experiences and R+D transfer.
2. Storage and organization: involves the structuring of knowledge in accessible and reusable repositories, under information quality standards; requiring appropriate technological systems (databases, intranets, KM platforms) and content governance structures.
3. Transfer and dissemination: these are the mechanisms that allow knowledge to be shared within the organization, including processes such as mentoring, strategic staff rotation, technical manuals, communities of practice, internal seminars and case documentation.
4. Strategic application and use: it consists of using stored and transferred knowledge to solve problems, innovate, make informed decisions and generate organizational value, this is related to naval design decisions, incremental and disruptive innovation processes, and development of own capabilities.

In short, since the end of the twentieth century, different academics have conceptualized the relevance of Intellectual Capital from the public and private perspective, only having the difference between the profit perspective between both sectors, in such a way that the most recent models for the treatment of IC at the organizational level point out the importance of three perspectives: Human Capital, Structural Capital and Relational Capital; since they intend to articulate the endogenous context with the exogenous context of the entity, that is, the IC measurement model at the level of an entity must integrate Shareholders and Stakeholders.(Bossi, A; Fuertes, Y & Serrano, C., 2005)(Gómez, L; Londoño, E & Mora, B, 2020)

In terms of the evolution of the postulates about the configuration of IC models, in his doctoral research he presents a line of broad relevance.(Bertolla, L, 2017)

Table 1. Timeline of the CI models.

YEAR	MODEL (AUTHOR)	FEATURES
1986	(Sveiby)	Explains intellectual capital in the processes of internal structure and external structure.
1991	(Edvinsson and Malone)	Identify the differences between book value and financial value in the three elements of capital: human, structural and customers.
1992	(Kaplan e Norton)	Translate strategies, maps, and indicators associated with key projects. A company's performance is measured by indicators that encompass four main perspectives: financial perspective, customer perspective, internal process perspectives, and

		learning perspective. The indicators are based on the company's strategic objectives.
1993	(The Swedish Association of Service Workers)	Analysis of the intangibles in the three elements of intellectual capital: customers, human and structural. They are measured by non-financial indicators. The first model that distinguishes between individual and structural capital.
1994	Matrix Features (Harvey and Lusch)	Identify tangible and intangible assets, visible and hidden, that imply an increase in value. A starting point for many companies, but it does not address human capital.
1994	Dow Chemical	The value of the organization is generated from the intersection of its three vertices, which are: human capital, organizational capital and relationships, focused on the value of the brand. It is the first report on intellectual capital presented by a U.S. company.
1995	Telugu	It proposes a knowledge audit by grouping intangible assets into three categories: customers, organization and people, and tries to quantify them through indicators that try to explain three variables: growth, stability and efficiency. It presents a new way of measuring intangibles, in which indicators try to explain certain variables. As a result, it presents information about the organization, customers, and employees.
1995	(Petrash)	They propose the management of intellectual assets based on three types of capital: organizational capital, customer capital, and human capital.
1996	(Brooking)	The value of intellectual capital is obtained from the diagnosis and analysis of the responses to a twenty-question questionnaire, which covers four main components of intellectual capital, classified as: market, human, intellectual property and infrastructure.
1996	(Bontis)	The factor from a technological point of view is calculated based on the patents developed by a company. Intellectual capital and its performance are measured based on impacts and research and development efforts in a number of indices, such as the number of patents and the cost of patents relative to gross sales, which can describe the company's patents.
1996	(Johansson)	Calculate the hidden impact of HR-related costs that reduce the company's profitability. Intellectual capital is measured by calculating the contribution of human assets held by the company, divided by expenses capitalized with salaries.
1996	(Saint-Honge)	It seeks to explain organizational culture on three classifications of capital: human, structural, and customer.
1996	(Sullivan)	Identify the sources of value and extraction in the aspects of structural capital, complementary business assets, human capital and intellectual capital.

1997	(Pulic)	It measures how much and how intellectual capital and capital employed create efficient value based on the relationship between three main components: capital employed, human capital, and structural capital.
1997	(Roos, Roos, Dragonetti and Edvinsson)	It consolidates all the individual indicators representing intellectual properties and their components into a single, predetermined offset. The changes in this shift are related to changes in the company's market value on the stock exchange.
1997	Intangible Assets Monitor (Sveiby)	It has a simple and easy-to-interpret presentation, but the choice of indicators is complex, as it uses a matrix of indicators. Management selects certain indicators classified into external structure, internal structure, and people competence, based on the organization's strategic objectives, to measure four main components: growth, renewal, efficiency, and stability. Some of these principles were first widely applied in 1986, in Sweden, and even in the format of the Skandia Navigator.
1997	Navegador Skandia, Skandia Navigator, (Edvinsson e Malone)	It is composed of five focus groups on intellectual capital: financial, customer, process, renewal, and human development. They propose for each set of indicators, establishing guidelines for action with reference to the different models. Establishment of intellectual capital as the sum of the capital obtained by the product of these monetary indicators corrected by the efficiency indicators. It has a global character, with a financial and complementary perspective that, as a whole, allows the estimation of the market value of the company.
1997	Balanced Scorecard	The strategy is comprised of a set of financial and non-financial indicators from four perspectives: financial, process, customer, and learning and growth. It has a global vision, avoiding the non-optimal use of resources. Integration of strategy and communication throughout the organization, facilitating implementation.
1997	(Stewart)	It is calculated by adjusting a company's reported profits with costs related to intangibles. Variations in VLE provide an indication of whether or not intellectual capital is productive.
1997	Tobim's Q	The "q" is the ratio of a company's market value (share price x number of shares) to the replacement cost of its assets. Changes in the "q" provide a representation to measure the effective or uneffective performance of a company's intellectual capital.
1998	(Luthy)	It calculates the additional return on tangible assets, and then uses that figure as the basis for determining the proportion of return attributable to intangible assets.
1998		It presents a balance that recognizes intellectual capital, from the individual perspective, associated with people, and from

	Invisible equilibrium (Arbetsgruppen and Sveiby)	the structural perspective, associated with the procedures and systems of the organization. Reference model for the development of intellectual capital statements.
1998	Bontis Model	The indicators suggested by the Bontis (1998) model, classified as human capital, structural capital, relational capital and performance, served as the basis for the development of a 63-question questionnaire that was initially applied in 1998 in Canada and subsequently administered again by Bontis et al. (2000) in 107 companies in Malaysia. among other studies.
1998	(M'Pherson)	It uses hierarchies of weights and indicators that are combined and focus on relative rather than absolute values. Combined value added = monetary value added combined with intangible value added.
1998	(Standfield)	Real value of a company = Tangible capital + Identified intellectual capital + Mismatch of intangible assets.
1998	Euro-forum	The intellectual capital model is the sum of three blocks of capital: human, structural, and relational. It is structured into four basic concepts: components, elements, variables and indicators.
1999	Lev	Knowledge capital gains are calculated as the portion of normalized income over revenue expectations attributable to accounting assets.
2000	Evaluation and Management (Nevado Peña and Lopez Ruiz)	Distinguishes between explicit and non-explicit intellectual capital, in order to evaluate the management of intellectual capital.
2000	HR Statement (Ahoen)	In their methodology, HR accounting gains and losses divide employee-related costs into three groups: renovation costs, development costs, and attrition costs.
2000	Intellectual Capital Bechmarking System (Marti)	Its objective is to benchmark using essential skills or intellectual capital, with information from the best competitors in the sector worldwide.
2000	Magic (UE Research Project)	It is based on the Skandia Navigator and measures intellectual capital from the elements of human capital, structural capital, knowledge capital and intangible capital.
2000	Nova Model (Nightgown, Palacios e Devece)	It calculates the difference between the intellectual capital situation in two different periods and the mutual effect of each block. General comparisons of intellectual capital allow a first approximation of its value.
2000	The Value Explorer (Andriessen e Tiessen)	It has an accounting methodology to calculate and determine the value of five types of intangibles: assets and talents, tacit skills and knowledge, collective values and norms, technology and explicit knowledge, preliminary and management processes.

2000	Total Value Creation (Anderson e McLean)	It uses discounted projected cash flows to evaluate how accounting events affect planning activities.
2000	Value Creation Index (Baum et al.)	It uses different non-financial performance indicators to calculate the market value of organizations, with adjustments according to the sector, which allows the executives' vision to be adapted.
2000	VAIC (Pulic)	Intellectual capital measurement model that, among its proposals, suggests that human capital expenditures should be accounted for in assets and their counterpart in liabilities, as added value. The author starts from the premise that expenses with employees should be recovered in the long term.
2001	Caba e Sierra Model (Caba e Sierra)	It is a model for measuring intellectual capital aimed at the public sector, based on the Quality Management Model, which integrates the elements in the three groups of intellectual capital: human capital, structural capital and relational capital.
2001	Knowledge Capital (Lev)	It estimates the normal earnings of an entity, deducting the contribution from physical and financial resources. It seeks to establish the difference between book value and market value, but does not take into account the relationships between resources.
2001	Intellectual Capital Index (Roos)	It defines that intellectual capital is composed of aspects of the human being, such as: competence, attitude, intellectual capacity and the structure of the organization, being: relationships, organization and renewal for development.
2001	Intangible Assets Statement (Garcia)	It is a model that aims to measure the intellectual capital of the public sector and uses indicators of growth/renewal, efficiency and stability.
2001	Knowledge Audit Cycle (Foam and Marr)	It is a measurement model that uses six dimensions of companies' capabilities, composed of four stages: definition of the main knowledge assets, identification of the main knowledge processes, planning of actions for the knowledge processes and, subsequently, their implementation and continuous monitoring to make improvements.
2001	Meritum (Garcia e Ayuso)	Separation of resources measured by indicators and intangible activities. It proposes a general framework for the disclosure of information on reference intangible assets.
2001	(Philip K, M'Pherson e Stephen Pike)	The goal is to measure the organization so that the contributions of intangibles are measured by themselves. Measurements, as long as they are feasible in practice, become tangible, and intangible assets are explicitly managed. This makes the contributions of intangibles to cash flow measurable.
2002	FiMIAM (Rodolv and Leiaert)	Its objective is to calculate the monetary value of the elements of intellectual capital, combining tangible and intangible assets,

		in order to establish a relationship between market value and book value.
2002	IC Rating (Edvinsson)	Expansion of its own Skandia Navigator model, to which it adds the monitoring of intangible assets, assessing efficiency, renewal and risk.
2002	Meritun Guidelines	This model has a framework for the management and disclosure of intangible assets divided into three stages: definition of strategic objectives, identification of intangible resources and actions to develop them. Intangible elements are divided into: human resources, structural capital and relational capital.
2002	Value Chain Scoreboard (Lev)	It aims to measure intellectual capital with non-financial indicators, divided into three categories related to the knowledge development cycle: discovery and learning, implementation, and commercialization.
2003	Danish Guidelines (Mouritzen, et al.)	The model is based on an annual statement, in which companies must disclose their knowledge, set of management challenges, series of initiatives and other relevant indicators.
2003	IC-dVal (Bonfour)	The model calculates intellectual capital using performance indicators in four dimensions of competitiveness: processes, products and intangible assets, resources and competencies, human capital, and structural capital.
2003	Public Sector IC (Bossi)	It is a model oriented to the public sector, which includes two perspectives: transparency and quality, in addition to identifying negative elements that generate social responsibility. It presents the concept of intellectual responsibility as a way of representing the appropriate space between management and administration, in addition to the duties that the public entity must fulfill with society.
2004	Intellectual Assets-Basead Management (Japanese Ministry of Economy, Trade and Industry)	It is a report of guidelines for measuring intellectual capital, which should contain the future-oriented management philosophy and intellectual asset indicators. It uses various indicators of the Meritum model.
2004	National Intelectual Capital Index (Bontis)	It seeks to measure the intellectual capital of countries, taking into account their financial wealth of intellectual capital, which is the sum of human and structural capital. It has several features in common with the Skandia Navigator
2004	(Seleim, Ashour e Bontis)	The indicators suggested by the Bontis Model (1998), classified as human capital, structural capital and relational capital, served as the basis for the development of a questionnaire with 37 questions that was applied to systems development companies in Egypt.
2004	SICAP	Its objective is to measure the value of the intellectual capital of public administrations, using a technological platform to facilitate more efficient management.

2004	Top Line/Business IQ (Sandvik)	The model presents a combination of four performance measurement indicators: corporate identity, human capital, knowledge capital and reputation.
2007	Dynamic Monetary Model (Milost)	The value of the company's employees is compared to the valuation of tangible assets, with the value of the employee in the organization being equal to the value of their hiring and maintenance.
2007	Intellectus Model (Sanches, et al.)	This model is structured in seven components, all of them with elements and variables. It has two particular characteristics, since it divides structural capital into organizational capital and technological capital. It also divides relational capital into social capital and entrepreneurial capital.
2008	EVVICAE (Mc Cutcheon)	Developed as a toolkit available on the web, based on the model of Sulivan (2000).
2008	Synthetic indicator of intellectual capital (López Ruiz, Nevado Peña and Baños Torres)	It proposes the grouping of indicators with financial and non-financial information, with the aim of comparing the intellectual capital of 25 countries of the European Union.
2008	Regional Intellectual Capital Index (Schiuma, Lerro e Carlucci)	It uses the Knoware Tree as a concept based on four perspectives (hardware, netware, wetware, software) to create a set of indicators.
2009	ICU Reperting (Sanchez)	Prepare a report on intellectual capital for universities. It consists of aspects related to the institution's vision, a summary of activities and intangible resources, and a system of indicators.
2009	(Ortiz)	Its objective is to analyze and group the components of the intellectual capital of world organizations using a humanistic model called CONICCVAL (evaluation of the intellectual context of the components of capital). The study assesses the difference in perception of the value of intangible assets according to the context.
2009	F-Jardón e Martos	Its objective is to determine if there is an intellectual performance of the companies and to determine the model that best adapts to the behavior of small and medium-sized timber companies in Argentina.
2010	Sharabati, Naji Jawad e Bontis	It seeks to measure the effect of intellectual capital elements on the business performance of pharmaceutical companies.

2011	NIKC National Index of Knowleadge Capital (López Ruiz et al.)	It proposes a model for measuring the capital of nations, adapted from microeconomics, which is based on the observation of hidden capital as an implicit generator of long-term wealth, which not only takes into account sustainability and social well-being, but also intangible assets such as development, economic structure, international trade, etc. image abroad and innovation. A similar study was carried out in 2014 in European and Asian countries.
2013	(Seleim and Bontis)	It sought to examine the relationship between national intellectual capital and economic performance in less developed countries. The study develops, measures and tests a general model of interrelationship between selected subcomponents of national intellectual capital and their impact on the economic performance of developing countries.
2014	DSBM (Lu, Wang e Kweh)	By applying the dynamic margin measurement model (DSBM), we seek to evaluate the performance of Chinese life insurance companies during the period 2006-2010 and examine the relationship between intellectual capital and performance.

Source: . (Bertolla, L, 2017)

Based on these models, authors such as , propose the application of management indicators for the measurement of intellectual capital based on models such as (Borras, F & Campos, L, 2018)West Ontario University, proposed by , by which IQ is measured from Human Capital, Structural Capital and Relational Capital.(Bontis, N, 1998)

However, the models indicated in Table 1, as well as the one created by Bontis, lack clear measurement indicators. It is there, when they mention that, based on empirical studies on IC analyzed in their research, the management indicators for IC are built taking into account a logical-methodological process of three phases: (Borras, F & Campos, L, 2018)

1. The understanding of the management of intellectual capital, through the analysis of the interrelationship between its components and variables; 2. The influence of intellectual capital on the economic-financial results of companies; 3. The content of reports on intellectual capital and their use by users of the information in decision-making (p.58).

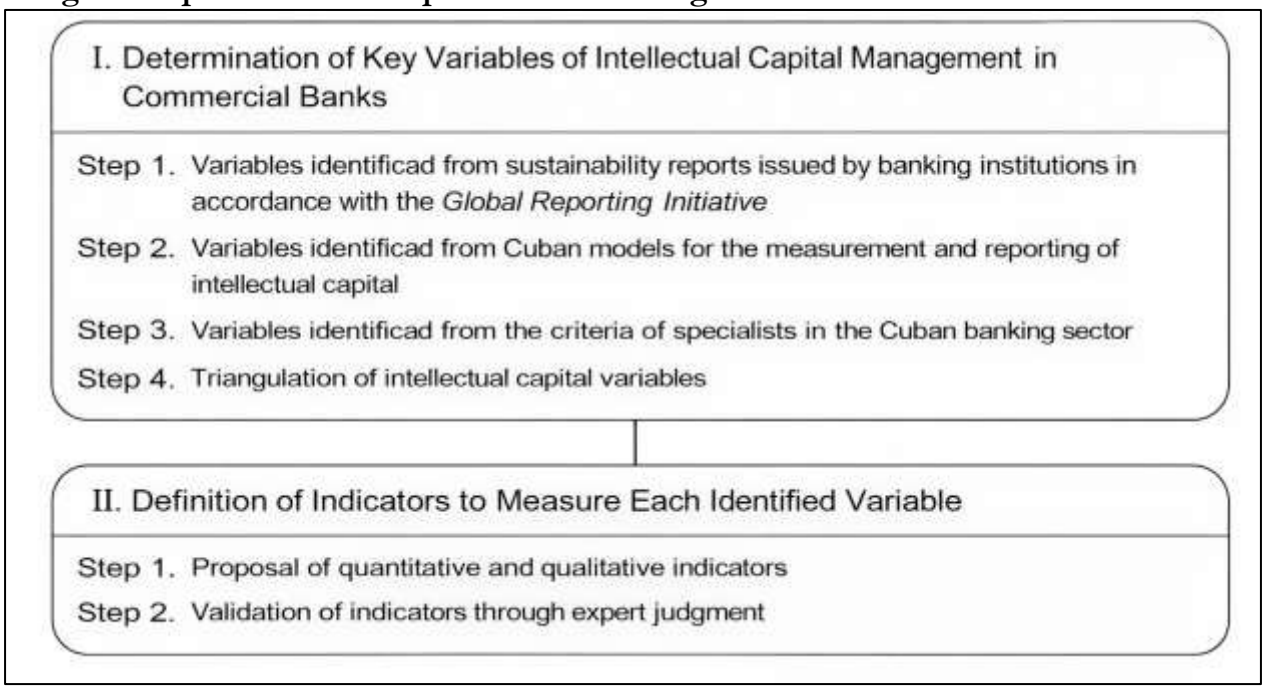
In addition, they point to evidence captured from empirical research by which there is a correlation between the variables of intellectual capital and the particularities of the different countries and types of companies; secondly, there is a close correlation between intellectual capital and the financial performance of organizations; and finally a boom in information reports and indicators on intellectual capital for decision-making on behalf of investors, analysts and company executives.(Borras, F & Campos, L, 2018)

This is how, ; they specify in their research the creation of management indicators for the measurement of IC in Cuban Commercial Banking, adding four dimensions: Human Capital, Structural Capital, Relational Capital and Social Capital.(Gálvez, A; Borras, F; Abadía, J, 2020)

It is then detailed, as it points out, that entities with a public orientation have the duty to link the social and even environmental component to the measurement of the IQ due to the effect of the obligations of the state and the lesser interest towards profit.(Bossi, A; Fuertes, Y & Serrano, C., 2005)

Therefore, they propose six steps for the formation of the bank of management indicators for IC at the corporate level without specificity of the economic sector.(Gálvez, A; Borras, F; Abadía, J, 2020)

Image 1. Steps for the development of IC management indicators.



Source: (Gálvez, A; Borras, F; Abadía, J, 2020)

These authors establish that the methodology to be used is logical-methodological, which allows configuring the model of management indicators from the conceptual to the practical, allowing a contextualized development related to the economic sector or organization analyzed.

As indicated, this methodology defines the objectives and methodological criteria, characteristics and structure that must be met by the models of measurement, valuation and exposure of intellectual capital for Cuban organizations. Each model will respond to the general methodological bases and, in turn, will incorporate in its design the variables and indicators that correspond to the particularities of a given sector(Borras, F y Ruso, F., 2015)

From the perspective of ; a quantitative model for measuring management indicators for IQ is established in 322 organizations in Malaysia. (Ozavize, A; Liu Y; Hasnah H y Hooi-Cheng; E, 2021)

This study investigates how knowledge management (KM) capabilities influence organizational performance, and how institutional accounting practices (IAPs) mediate that relationship in knowledge-based organizations (KBOs) in Malaysia.

Using knowledge-based theory (KBT), the authors evaluate two KM-specific capabilities: infrastructure (KMI), related to employee competence, and processes (KMP), related to how knowledge is managed.

Using a structural equation model with data from 322 employees, it was found that KMI has a positive and significant direct impact on organizational performance, while KMP did not show a direct effect, but a significant indirect effect through accounting practices. IAPs were shown to partially mediate the relationship between KMI and organizational performance, and to fully mediate between KMP and performance.

These findings suggest that institutional accounting practices play a critical role in the success of KM strategies and that their inclusion in management models can improve decision-making and organizational performance. Organizations are encouraged to design KM initiatives that strengthen both infrastructure and knowledge processes, integrating them with accounting to maximize strategic benefits.

FINAL CONSIDERATIONS

The creation of value management indicators for intellectual capital in an economic sector with constant knowledge management, such as the shipyard, may be the beginning in Colombia of the application extended to other economic sectors with a workforce dedicated to science, technology and innovation of products, services and processes. The purpose of value management indicators is to correctly reflect the wealth of our nation through the financial figures of organizations in relation to the knowledge management of IC, so; the beginning of the categorization of IC as an important indicator for decision-making at the organizational level, which is being limited in measurement as intangible by the provisions of IAS 38, IPSAS 31 and Section 18 of the IFRS for SMEs.

Bibliographic References

1. Bertolla, L. (2017). Measurement and evaluation of intellectual capital of companies developing systems associated with local productive arrangements of information technology in the State of Rio Grande do Sul. Obtained from Doctoral Thesis in Administration, Universidade de Caixas Do Sul: https://repositorio.ucs.br/xmlui/handle/11338/3183
2. Bontis, N. (1998). Intellectual capital: an exploratory study that develops measures and models. Obtenido de Management Decision, 36(2), 63-76: https://doi.org/10.1108/00251749810204142
3. Borras, F & Campos, L. (2018). Intellectual Capital in Cuban Companies. Retrieved from Ing. Ind. vol.39 no.1 Havana Jan.-Apr. 2018: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1815-59362018000100007
4. Borras, F & Ruso, F. (2015). Intellectual Capital: Critical Vision and Proposals for Cuban Organizations. Retrieved from Havana, Cuba: Ed. UH. .
5. Bossi, A; Fuertes, Y & Serrano, C. (2005). Reflections on the application of intellectual capital in the public sector. Retrieved from Revista Española de Financiación y Contabilidad, Vol 34, January-March: https://www.aeca.es/old/refc_1972-2013/2005/124-7.pdf
6. Chamber of Commerce of Cartagena. (2022). Report of the municipalities of the jurisdiction of the City of Cartagena de Indias. Retrieved from https://www.cccartagena.org.co/wp-content/uploads/2022/01/Informe-economico-de-la-Jurisdiccion-Camara-de-Comercio-de-Cartagena-2021.pdf
7. Caro, Soraya. (2021). Shipbuilding sector, a new perspective. Retrieved from FIGRI Researcher Universidad Externado de Colombia: https://www.larepublica.co/analisis/soraya-caro-vargas-3137400/sector-astillero-una-nueva-perspectiva-3137399
8. Gálvez, A; Borras, F; Abadía, J. (2020). Intellectual Capital Management Indicators for Cuban Commercial Banking. Retrieved from Retos de la Direccion, 14(1), 310-336. Epub January 05, 2020: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2306-91552020000100310&lng=es&tlng=es.
9. Government of Colombia. (2022). Shipyard Sector. Retrieved from

https://www.colombia.co/extranjeros/negocios-en-colombia/cifras/por-que-el-sector-astillero-en-colombia-se-perfila-como-potencia-mundial-infografia/
10. Gómez, L; Londoño, E & Mora, B. (2020). Intellectual capital models at the business level and their contribution to value creation . Retrieved from CEA Magazine, vol. 6, no. 11, pp. 165-184, 2020: https://www.redalyc.org/journal/6381/638171128010/html/
11. Ozavize, A; Liu Y; Hasnah H and Hooi-Cheng; E. (2021). Knowledge Management and Organizational Performance: The Neglected Role of Institutional Accounting Practices. Retrieved from International Journal of Business and Society, 22(3), 1639–1655. https://doi.org/10.33736/ijbs.4327.2021:
https://publisher.unimas.my/ojs/index.php/IJBS/article/view/4327