

# Methods of evaluation of intangible assets and intellectual capital

Marilei Osinski and Paulo Mauricio Selig  
*Universidade Federal de Santa Catarina, Florianópolis, Brazil*

Florinda Matos  
*Intellectual Capital Accreditation Association, Santarém, Portugal, and*

Darlan José Roman  
*Universidade do Oeste de Santa Catarina, Chapecó, Brazil*

## Abstract

**Purpose** – The competitive model has changed. In this context, society entered into an era in which intangible assets are the greatest assets of a company. However, some gaps and uncertainties are presented in the literature as to understand the value of a company based on knowledge intensive activities. The purpose of this paper is to analyze the methods of evaluation of intangible assets in the context of business, economic and strategic management.

**Design/methodology/approach** – This is a qualitative research. This research is characterized as descriptive, bibliographic, inductive.

**Findings** – The main results of this research can highlight the existence of valuation methods of intangible assets intended for specific industries, as public and/or private, that can be better aligned to the context of business; economic and/or strategic management.

**Originality/value** – It was found that intangible assets are a current topic and increasingly addressed in the literature.

**Keywords** Methods, Intellectual capital, Intangible assets, Methods of evaluation, Methods of evaluation of intangible assets

**Paper type** Literature review

## 1. Introduction

The world economy has been through constant and significant transformations. One of the main effects of such transformations is the increase in the value of intangible assets, considering sources of organizational value generation. With the globalization of the economy, there is a greater demand for information, imposing, among others, changes in the way of measuring the patrimony of the organizations (Scherer *et al.*, 2004).

Intangible assets, in this context, are increasingly important, influencing organizational competitiveness (Sveiby, 2010). Among the authors of the area, stands out Sveiby, who published several studies, serving as inspiration for this work. The purpose of this research is to analyze the methods for evaluating intangible assets in the context of business, economic and strategic management.

Several studies dealing with intangible assets and intellectual capital have been developed (Stewart, 1997; Bontis *et al.*, 1999; Sullivan, 2000; McPherson and Pike, 2001; Silva *et al.*, 2002; Milost, 2007). Among these studies, some authors consider intangible assets as synonymous with intellectual capital and others that treat them as distinct themes. Sveiby (2004) considers intellectual capital as a strategic and unlimited resource.

According to Lev (2001), the terms intangible assets (in the accounting literature), assets based on knowledge (by economists) and intellectual capital (in the areas of management and law) can be used interchangeably. In practice, these terms essentially correspond to a non-physical entitlement to future benefits. Knowledge-based assets are characterized by being expensive to acquire and develop and difficult to manage.



Hoss *et al.* (2009) argue that intangible assets are sources of sustainable competitive advantage for organizations. In addition, they emphasize the importance of a method of valuing intangible assets to support various administrative issues, such as investment decisions, negotiations with lenders, and raising of investors' capital.

After this introduction section, the structure of this study presents, in the following section, the literature review, dealing with the methods of evaluation of intangible assets and intellectual capital. The following, are the methodological procedures and the data analysis and, finally, the final considerations followed by the references.

## 2. Intellectual capital

Today, organizations compete based on their intellectual assets, in a knowledge economy, where functions, which require more skills, are performed by knowledge workers, and the organizations that improve from their past experiences are learning organizations. In this scenario of innovation, with the constant need of organizations to search for better products and services, it is the intellectual capital of companies that increasingly determines their competitive positions (Klein, 1998).

According to Rodrigues *et al.* (2009), the intellectual capital consists of the ability of a given organization to transform its knowledge and intangible assets into wealth, as well as resource creation. The management of intellectual capital, in turn, is considered to be the process of extracting the value of knowledge. They, also, point out that all intangible resources are considered as intellectual capital, whose components are human capital, structural capital and relational capital.

Lev (2001) points out that intellectual capital can be created by human resources, with innovation and organizational practices. In this sense, structural capital is the result of the sum of the knowledge of all members of the organization. Intellectual capital does not have a physical or financial body, but is considered as a right to future benefits. Knowledge is currently one of the main competitive tools and it is in human capital that all innovations are initiated (Hoss *et al.*, 2009).

According to Rocha (2012), the human capital of an organization is composed by competencies, knowledge, capacities, talents and know-how, attitudes, ducts, motivation, performance and ethics of the people, values, attitudes, creative capacity and innovation, satisfaction and loyalty, as well as intellectual agility, dexterity and experiences of employees and directors.

Structural capital, in turn, is what the organization can absorb from its employees, even when they stop working in there. It consists of the set of intangible assets and knowledge arising from organizational processes, which are owned by the organization and remain the same when employees leave it (Bueno *et al.*, 2011).

Bueno *et al.* (2011) defines relational capital as the set of skills that are incorporated into the organization and to the individuals that belong to it. Relational capital results from relationships with different agents in the market and with society in general.

According to Rezende (2001), the intellectual capital is composed by intangible assets that can be divided into three distinct categories: market assets, individual competence assets and structure assets. It should be noted that the descriptions of these elements are similar to those presented by Lev (2001), Rodrigues *et al.* (2009) and Rocha (2012).

In this context, it becomes relevant and necessary to identify how intellectual capital can influence the value of a company; how to measure it and/or determine its value, as well as understand how organizational knowledge can be measured (Wernke, 2002). Joia (2001) emphasizes that despite the difficulty, it is not impossible for knowledge (intangible) to be measured. It emphasizes that markets, when assessing the actions of some companies based on knowledge, measure it, with value well above that registered in the accounting books.

Despite the need for measurement, Hoss (2008, p. 12) points out that knowledge assets, besides being diffuse, are also difficult to control. In this sense, when it comes to some physical good, it can be easily measured, which does not occur, for example, with a brilliant idea, capable of revolutionizing companies, since it can be stolen and even used by competitors, which makes its benefits uncertain.

According to Tonet and Paz (2006), the market value of certain organizations is many times greater than the value of the financial and/or physical equity that they own. In such cases, shares are so valuable because incorporate intangible values (brand, innovation capacity, talents and skills). A significant part of intangible values is aggregated by knowledge, resulting from new experiences, as well as continuous and shared learning.

For to Klein (1998), the intellectual capital of companies consists on experience, knowledge, specialization and several intangible assets. This set, which composes intellectual capital, determines the competitive conditions in the market, not its tangible physical and financial capital. In this scenario, the "summation" of team members' collective knowledge assumes significant importance in the business environment, in the case of intangible assets. In the organizational environment, skills for creating, multiplying and using knowledge and skills are increasingly required (Wernke, 2002).

On the other hand, Rezende (2001) emphasizes that intellectual capital is constituted by the mental capacity that individuals should have to carry out activities in an efficient and creative way, as well as by their potential for innovation. The author considers that these are intangible assets, such as: relationship with customers and suppliers and high level of success with research and development of products, which distinguish organizations from their competitors.

In the same sense, Padoveze (2000) states that intellectual capital gives the organization a certain distinction *vis-à-vis* its competitors, which can guarantee certain economic benefits. Items such as image, reputation, information technologies, customer portfolio, flexibility, knowledge domain, skilled employees, brands, patents, among others, are indispensable in the organizational environment. In this context, the concept of intellectual capital emerges as the main responsible "for the distinction of certain companies from their competitors" (Wernke, 2002, p. 62).

There are scientific findings that justify the need to invest in intangible assets and intellectual capital, such as the results of the study developed by Sydler *et al.* (2014). In this study, the authors demonstrate that investments made in intellectual capital transform into revenues after one year, inferring that in the long-term investments made in capital can have significant returns. In addition, there is an explicit recognition by many organizations that intellectual capital is a source of essential competitive advantage that must be managed systematically (Klein, 1998).

In the same sense, the study developed by Giuliani and Marasca (2011) highlights the relevance of the existence of a process of valorization of intellectual capital. The same authors infer that the process of evaluation of intellectual capital can be considered an opportunity both to visualize and to understand how intellectual capital can influence the financial performance of the organization.

Davenport *et al.* (1998) assert that in business, information (and increasing quality) is a critical resource. The expansion of information use and access to information is the way to improve business performance, as it is critical to the existence of information-based organizations and knowledge-based enterprises.

According to the information presented, it can be seen that there is agreement of the authors regarding the valuation of knowledge as a factor of organizational distinction before their competitors. Contrasting the previous view, that prioritized only material goods/physical assets, it started to value innovation, creativity and knowledge, so that the human element raised the highest level possible (Wernke, 2002).

There are several methods, models and tools available for the evaluation of intellectual capital. However, no evaluation instrument can be considered unquestionable. It is increasingly sought to develop more efficient methods, since the market has given organizations, in most negotiations, values considerably higher than those found in formal accounting items (Wernke, 2002).

### 2.1 Intangible assets

Intangible assets are assets that originate fundamentally in knowledge and cannot be touched because they do not have physical body. The same authors consider that implied knowledge and skills; culture and values; technology and explicit knowledge; process management; assets (image, customer relations, networks) are generators of intangible assets (Hoss *et al.*, 2009).

Intangible assets are considered by Hoss *et al.* (2009) as resulting of the human resources that, through their efforts within the organization, create an internal structure of knowledge. In addition, intangible assets represent, in several situations, the highest organizational value, although they are not generally measured in accounting statements due to legal or accounting restrictions.

When assessing the profitability, as well as the performance of a specific business, in order to reflect the return on investment or equity, intangible capital should be considered. Intangible assets, such as software products, brands and/or differentiated organizational projects, have not been properly evidenced in organizations' balance sheets (Hoss, 2011).

According to Kayo (2002, p. 14), "as a structured set of knowledge, practices and attitudes of the company, interacting with its tangible assets (fixed assets and working capital) contributes to the formation of intangible assets. Value of enterprises". Schmidt and Santos (2002) cite examples of intangible assets, such as: implantation and pre-operational expenses; brands and product names; research and development; goodwill; patents; franchises; copyright; software development; and licenses.

In this context, we verify that intangible assets become one of the most important sources of organizational competitive advantages today. In addition, knowledge is admitted as a source of economic resource, and dealing with this judgment and the intangible, constitutes one of the greatest challenges for accounting. The recognition and measurement of intangible assets are relevant to organizational management, as well as to evaluate the strategies adopted and guide the decisions of capital providers (Perez and Famá, 2006).

As shown by Perez and Famá (2006, p. 23), intangible assets are important in generating shareholder value. Moreover, even if investments in intangible assets "may adversely affect short-term accounting profit, they can effectively create value in the company, stimulate its growth through new investments", as well as contribute positively to the increase of the wealth of the company's shareholders.

The intangible assets, although they cannot be accounted, they can be measured, for example, at the time of the sale of shares. In this case, "the value of intangible assets is calculated by the difference between the net tangible value and the value of the company's shares in the market. At the end, this amount will be accounted for in the final purchase price." As several authors, do not agree with this form of calculation, they point to other methods for the calculation of intangible assets (Freire, 2012, p. 112).

In this context, the market value of a given company results from the evaluation of both its tangible and intangible assets, which should be evaluated. The value of tangible assets (the result of the sum of property, plant and equipment and working capital) can be easily measured. The valuation of intangible assets, in turn, can be considered a more complex task, due to the diversity of methods and variables available (Stewart, 2001; Kayo *et al.*, 2006).

In addition, Müller and Teló (2003) add that organizations have certain values in their shareholders' equity that are very different from the values by which they are bought and sold.

The authors suggest that the evaluation of companies involves other variables than objective variables (stock price and organizational equity), such as: credibility in the market, value of the brand or its products, among others, which composes the subjective variables.

According to Wernke (2002), the objective evaluation of the intangible assets is difficult, as well as their identification and conceptual definition, since they have peculiarities. In many cases, intangible assets come from a variety of sources and can take on different formats, which contribute to difficult the use of traditional accounting forms in their identification and evaluation.

Simply measuring the value of intangible assets, considering the difference between the market value of the organizations and their book value, is considered unsatisfactory by Hoss (2011, p. 13). This author justifies that such an attitude is based on two false premises: one of which there is no incorrect value in the capital market, and another one that the balances recorded at historical values do not reflect current actual value. So, Intangible assets are important in the business field and should be measured.

In the same sense, Stewart (1997) points out that when the price paid for the shares of a given company is much higher than the book value, it is the confirmation of the presence of the intangible assets. In addition, it says that intangible assets can outpace tangible value added to the organization.

For Wernke (2002, p. 57), the existence of various methods and viewpoints on the evaluation of intangible assets, basically agrees on one aspect: the importance of trying to evaluate them. This reality is due to the information needs of managers and investors, who need subsidies that guide their decision making when they involve intangible factors. The deficiency of information in this area “becomes more evident when the decision involves the relationship between intangible assets and the market value of the company.”

The market value in the evaluation of the company can be influenced by several exogenous and endogenous factors. The factors external to this process are those on which the company has little or no control. The internal factors, in turn, those that the company is able to manage with reasonable ease. Because of the influence of many factors, the value of the company is a problem that has repercussions in the accounting area (Wernke, 2002).

Due to the gap between the market value of the companies (stock market value) and the value recorded by accounting, Wernke (2002) states that two points deserve attention. One is that which is effectively understood by the terms “enterprise market value” and “enterprise book value”; and the other point is to understand which factors interfere in the quotation of shares on the stock exchange, considering the peculiarities of the stock market and the accounting principles.

Concluding, evaluate assets is not only “one concept or procedure that is ideal and cannot be defined and generalized about which method will be most appropriate for a particular case or purpose.” In fact, all methods have their own characteristics and limitations, and it is up to the evaluator to adapt to their needs. Moreover, in the asset valuation process, the difficulty is not simply to choose the most convenient method, but also to raise the data and information that is necessary for that purpose (Wernke, 2002, p. 43).

### 3. Methodological procedures

This research is characterized as applied, according to Almeida (2011), Gil (1999), because it makes use of knowledge that has already been systematized and aims to generate knowledge for practical application. The classification of the research, regarding the approach is qualitative and has an inductive approach, without using any statistical tools. The methodological procedures are classified as a bibliographical study – using material already published – and documentary – through the analysis of original documents (Almeida, 2011).

It is also characterized as a descriptive study, it aims to describe the object of study and its characteristics (Gil, 1991; Lakatos and Marconi, 1986). This research uses primary data

that has been obtained in books, articles, periodicals and websites. The data are analyzed and presented below.

For the accomplishment of the present research an “Advanced Search” was done by articles in several databases, referenced in the Web of Science. The searches in the databases were initially carried out with the following keywords: “Economic Value Added,” “Intellectual Capital,” “Goodwill,” “Measurement.”

The search was limited in order to search for jobs that contained the mentioned keywords only for the “title.” In addition, another filter has been inserted to search only articles in the English language, published in the last ten years. Several studies were found, but after reading the titles, abstracts and keywords, it was verified that they dealt with several themes, without taking into account the interest of the present research.

Thus, the search was extended to other periodicals, websites and books of the area, without restricting the theme, but specifically seeking materials that could meet the purpose of the study, which consisted of analyzing the methods of evaluation of intangible assets in the context of business, economic and strategic management.

At that time, new searches were carried out using the keywords mentioned in the articles that had more relation with the subject in question, such as: “Intellectual capital, Intangible assets,” “Intangibles, Management, Measurement,” “Accounting; Accounting valuation; Financial performance; Intangible assets; Intellectual capital; Measurement; Valuations,” “Intangibles, Intellectual Capital,” “Intangibles, accounting,” “Accounting for intangibles.” The materials found were read, selected and the most adequate ones were analyzed for the elaboration of the present research.

#### 4. Data analysis

The present section, data analysis, occurs in a descriptive and comparative way. The data collected with the accomplishment of the present research were analyzed from predetermined criteria from the information in the literature. These criteria consisted on the analysis of aspects such as: year of publication of the method; author of the method; objective of the method; to which sectors it is intended.

Based on the elaboration of the present research it is noticed that the development of methods of evaluation of intangible assets and intellectual capital had a significant increase from 1988. In addition, it is verified that the year that had more methods of evaluation developed was 2002, with five methods presented. In the years 1997, 2000 and 2004, four methods were developed each year, which is the second highest number of annual publications (Sveiby, 2010).

In addition, it was found that some authors have elaborated more than one method of evaluating intangible assets, both individually and in groups. These authors, who elaborated two methods each, were: Lev: Knowledge Capital Earnings and Value Chain Scoreboard<sup>TM</sup>; Stewart: Calculated Intangible Value (CIV) and Economic Value Added (EVA<sup>TM</sup>) (with Stern’s participation); Edvinsson (with Roos, Roos, Dragonetti): IC-Index<sup>TM</sup> and Skandia Navigator<sup>TM</sup> (with Malone’s participation); Sveiby: Intangible Asset Monitor and The Invisible Balance Sheet (Sveiby, 2010). Figure 1 presents a timeline of intangible asset valuation methods.

Among the 44 methods of evaluating intangible assets presented in Figure 1, 31 of these methods are equivalent to 70 percent of the total number of methods in question. In the next paragraphs the objectives of the methods are presented, grouping them and pointing out common aspects among them.

The purpose of the CIV Report (Stewart, 1997) is to make recommendations for the dissemination of information on university research that portrays the logical movement of management and internal strategy (institution vision and goals) for the dissemination of indicators, considering previous orientations for companies and for the universities.



In addition, the The Value Explorer™ (Andriessen and Tiessen, 2000) method aims to identify the intellectual capital that is strategically important to an organization, as well as the EVVICAETM (McCutcheon, 2008) method, which aimed to help companies comparing potential product development opportunities strategically as well as their probable commercial return (Sveiby, 2004, 2010).

In the context of the strategy, the Balanced ScoreCard (Kaplan and Norton, 1992) aims to translate the organizational strategy into operational objectives that orientate behavior and performance. The Tobin's  $q$  (Tobin James) method also aims to measure the effective performance of a firm's intellectual capital, while the Value Added Intellectual Coefficient (VAICTM) method developed by Pulic (1997), seeks to measure how much and how effectively intellectual capital can create organizational value. Likewise, the Intangible Asset Monitor (Sveiby, 1997) aims to measure four aspects of value creation: growth; innovation; efficiency; and risk/stability reduction (Sveiby, 2004, 2010).

The Innovation aspect is also considered by the Value Chain Scoreboard™ (Lev, 2001) which seeks to improve reports on investments in intangible assets and innovation. The *Topplinjen/Business IQ* (Sandvik, 2004) method aims to evaluate the work environment, managers and clients, taking care of analysis and reporting. Danish Guidelines (Mouritzen *et al.*, 2003) on the other hand, seek to provide guidelines on how companies should report their intangible assets publicly (Sveiby, 2004, 2010).

Similarly, the purpose of the intangible assets statement is to properly manage resources; and, properly disclose information about them. In the same way, the SICAP (Ramirez, 2010) aims to inform practitioners about the administrative capacity to generate sustainable results and the possibilities for steady improvement, overcoming the short-term view of traditional financial accounting methods. To achieve sustainable results, the Investor Assigned Market Value (IAMV™) method (Standfield, 1998) aims to distinguish the real value of a company from its market value/stock value, aiming to obtain a sustainable competitive advantage (Sveiby, 2004, 2010).

In the same sense, the IC-dVAL™ (Bonfour, 2003) aims the development of competitive advantage. On the other hand, the purpose of the IMFAM – Financial Method of Intangible Assets Measurement (Rodov and Leliaert, 2002), is to overcome the shortcomings of the other intellectual capital assessment methods, as well as contribute to the creation of more complete balance sheets, reflecting both the tangible assets and the intangible assets of the organizations (Sveiby, 2004, 2010).

The European Foundation Quality Management Model (EFQM) also aims to develop the means to identify, measure and manage intangible assets. The goal of the IC-Index™ method (Roos *et al.*, 1997) is to develop a system for visualizing and measuring intellectual capital, while the IC Rating™ (Edvinsson, 2002) aims to enable intangible goods and intellectual capital to be viewed systemically. In turn, the Knowledge Audit Cycle (Schiuma and Marr, 2001) was designed to evaluate the dimensions of a knowledge organization (Sveiby, 2004, 2010).

Among the dimensions, several methods approach human resources, such as Dynamic monetary model (Milost, 2007), which aims to evaluate the employees of a given organization, considering that they constitute an important and fundamental element of the business. Similarly, Human Resource Costing and Accounting (HRCA 2) (Johansson, 1996) and Human Resource Costing and Accounting (HRCA 1) (Flamholtz, 1985) aim, respectively, to: calculate the impact of human resources costs, which could reduce or increase organizational profit; and, estimate the period; identify tasks; calculate the service; determine the monetary value; calculate the value of the service of a particular employee (Sveiby, 2004, 2010).

In addition, other dimensions are addressed, such as Intellectual Asset Valuation (Sullivan, 2000), which seeks to assess the value of Intellectual Property. The Intellectus

Model (Sanchez-Canizares *et al.*, 2007), in turn, treats organizational culture as the core and essence of the company. On the other hand, the Total Value Creation (TVC<sup>TM</sup>) (Andersen and McLean, 2000) has the purpose of evaluating how the various events can affect the planned activities (Sveiby, 2004, 2010).

In a different way, Economic Value Added (EVA<sup>TM</sup>) (Stewart, 1997) seeks to measure true business profitability; the Skandia Navigator<sup>TM</sup> (Edvinsson and Malone, 1997) aims to provide a balanced and holistic image of financial actions and intellectual capital. The Value Creation Index (VCI) (Baum *et al.*, 2000) aims to value the existence of different non-financial metrics to explain the companies' market value (Sveiby, 2004, 2010).

Finally, knowledge capital earnings (Lev, 1999) aims to determine the value of organizational intellectual capital and to assess the extent to which a company is overvalued or undervalued in the capital market. Inclusive valuation methodology (IVM) (McPherson and Pike, 2001) in turn, seeks to measure the contributions of intangible assets to the organization, making them measurable, estimating business value and shareholder value (Sveiby, 2004, 2010).

According to the present research, it can be stated that for the public sector the methods that are most recommended are: SICAP; Public sector IC (Bossi, 2003); EFQM (European Foundation for Quality Management, 2003); intangible assets statement (García, 2001).

Such methods of evaluating intangible assets have been developed specifically for public organizations. In addition, the IC-dVAL<sup>TM</sup> (Bonfour, 2003) method can be used by both public and private sector organizations.

The methods: ICU Report (Sanchez *et al.*, 2009); EVVICAE<sup>TM</sup> (McCutcheon, 2008); IVM (McPherson and Pike, 2001), in turn, are more popular for the private sector. It is worth mention that the other methods can be applied in any type of organization (public, private or third sector). In addition, the Accounting for the Future (AFTF) (Nash, 1998) method is recommended for publicly traded organizations.

#### *4.1 Analysis under the vision of business management: economic and strategic*

The present research sought to identify which methods of evaluating intangible assets were more aligned to the context of corporate, economic, and strategic management. To achieve this objective, it was necessary to define the criteria on which the authors based themselves in order to identify the degree of adherence of each method to its context.

The definition of the criteria was made based on the literature. First, it was identified which are the criteria that the business management uses to define their degree of adherence to a given method. Next, it deals with the economic management and, finally, with the strategic management.

In the initial part of each of the next three sub-chapters the literature on the context of the management in question is presented, followed by the presentation of the intensity of its adherence to each method. In this context, the intensity of the adherence of a method to a given management can be: "strong adherence," "Medium adhesion," "Poor adherence" or "zero compliance."

**4.1.1 Business management.** Corporate management refers to structures and processes that seek organizational direction and control. It is composed by the planning, execution, verification and action stages, managing risks and possible socio-environmental impacts in a structured and continuous way. In addition, business management can contribute to sustainable economic development by strengthening organizational performance, including better financial results (International Finance Corporation, 2015).

Business management seeks to improve the productivity and competitiveness of an organization or business. For management to be optimal and achieve good results,

Kwasnicka (1995) states that there are four functions that he must fulfill. These functions aim at efficient management, capable of producing good results and consist of:

- plan: through the definition of objectives and means to reach them, producing new projects, profitable for the company;
- organize: aims to group all the organizational resources to promote teamwork and obtain better use of available assets;
- directing: the direction consists in the influence with the intention to motivate the people; and
- control: check and evaluate which planning steps have already been performed and correct failures to enable progress quantification.

*4.1.2 Economic management.* According to Leite and Santos (2013), economic management has shown an increasing interest in the measurement of intangible assets, seeking to know how much they are worth to the buyer. An intangible asset, added to the other existing assets can generate additional competitive advantage to the organization, leveraging the strategy and business of the buying company.

The Economic Value Added (EVA™) (Stewart, 1997) method, for example, was created to be used as a source of information, enabling the knowledge and measurement of business performance, relating the creation of value to the shareholder. The EVA™ derives from the approach of economic profit, seeking to measure the value that is created in a business during a certain period (Leite and Santos, 2013).

According to Moretto Neto and Schmitt (2014), economic and financial management requires the continuous monitoring of organizational resources in order to increase opportunities and added values. For the financial management of the company it is important to calculate the direct and indirect costs and the contribution margin, as well as the idleness of human capital, machinery and equipment that can be characterized as determinants of organizational health.

*4.1.3 Strategic management.* The strategy is, according to Lacombe (2004), the set of plans and guidelines drawn in order to achieve the organizational objectives. The balanced scorecard (Kaplan and Norton, 1992), for example, is a management method that enables the identification of organizational needs, as well as measuring the degree to which business strategy can become a result.

The criteria defined for business management were: productivity; value added; organizational competitiveness; sustainable economy; systemic vision; and organizational performance. Regarding economic management, the defined criteria were: Business performance; creation of shareholder value; financial and monetary approach and economic profit. Finally, in what it refers to strategic management, the defined criteria consist on: results, plans and guidelines, organizational goals, strategic objectives, competitive advantage, and organizational strategy.

The adherence of each method of evaluating intangible assets to the context of business, economic and strategic management was identified. The identification of the most appropriate context occurred from the analysis of the information presented in the literature, regarding the mentioned methods, classifying the adherence in: “strong adherence,” “Medium adhesion,” “Poor adherence,” or “zero compliance” in relation to the context of the management in question.

At this stage of data analysis, it focuses on the “strong adherence” to a given management context. “Strong adherence” is considered to be more relevant if an organization has an interest in applying a particular method of valuation of intangible assets and may do so in accordance with its objectives and in the most appropriate context.

It was verified that the methods with strong adherence to the context of business management are: IAbM (Johanson *et al.*, 2009), SICAP (Ramirez, 2010), NICI (Bontis, 2004),

*Topplinjen/Business IQ* (Sandvik, 2004), public sector IC (Bossi, 2003), intellectus model (Sanchez-Canizares *et al.*, 2007), FiMIAM (Rodov and Leliaert, 2002), Rating™ (Edvinsson, 2002), EFQM (Caba and Sierra, 2001), VAIC™ (Pulic, 1997), IC-index (Roos *et al.*, 1997), technology broker (Brooking, 1996), citation-weighted patents (Bontis, 2001), holistic accounts (Ramirez, 2010), Hoss Method (Hoss, 2008). Such methods are concerned with organizational resources broadly, seeking to add value and improve organizational competitiveness.

In the literature dealing with business management, there is information systemically, considering that it can contribute to the development of a sustainable economy, through the strengthening of organizational performance. It can also achieve better financial results as it seeks to improve the productivity and competitiveness of the organization or business (International Finance Corporation, 2015).

As for the context of economic management, it is noted that the methods: dynamic monetary model (Milost, 2007), IC-dVAL™ (Bonfour, 2003), knowledge audit cycle (Schiuma and Marr, 2001), VCI (Baum *et al.*, 2000), intellectual asset valuation (Sullivan, 2000), knowledge capital earnings (Lev, 1999), IVM (McPherson and Pike, 2001), AFTF (Nash, 1998), IAMV™ (Standfield, 1998), EVA™ (Stewart, 1997), Skandia Navigator™ (Edvinsson and Malone, 1997), Balanced ScoreCard (Kaplan and Norton, 1992), HR statement (Ahonen, 1998), The Invisible Balance Sheet (Sveiby, 1997), HRCA 2 (Johansson, 1996), HRCA 1 (Flamholtz, 1985) and Tobin's *q* (Tobin, 1969) presented strong adherence to the context of said management. This finding regarding the adherence to the context of economic management is justified by the literature of the area, which even quotes the EVA® (Stewart, 1997) method as an example of a tool to be used by economic management.

The methods adhering to the context of economic management can enable the knowledge and measurement of business performance, relating the creation of value to the shareholder. In addition, such methods consider financial and monetary approaches, such as economic profit, that seek to measure the value that is created in a business during a given period (Leite and Santos, 2013).

Finally, about the context of strategic management, it is noted that the methods with strong adherence are: ICU Report (Sanchez *et al.*, 2009); EVVICAETM (McCutcheon, 2008), RICI (Schiuma *et al.*, 2008), Danish guidelines (Mouritzen *et al.*, 2003), Value Chain Scoreboard™ (Lev, 2001), Meritum Guidelines (Johanson *et al.*, 2009), intangible assets statement (García, 2001), The Value Explorer™ (Andriessen and Tiessen, 2000), Balanced Scorecard (Kaplan and Norton, 1992) and TVCTM (Andersen and McLean, 2000). It is worth mentioning that the Balanced Scorecard (Kaplan and Norton, 1992) method is cited as an example in the literature dealing with strategic management, considered relevant by the authors of the area.

The methods that have a strong adherence to the context of strategic management seek to identify organizational needs, in addition to measuring the degree to which business strategy can become a result. The strategy is formed by the set of plans and guidelines drawn in order to achieve the organizational objectives (Lacombe, 2004).

In addition, the literature on methods that have strong adherence to the context of strategic management exposes the need to achieve the strategic objectives of the organization and demonstrate concern with competitive advantage and/or organizational strategy. Strategies are, according to Porter (1999), ways that organizations can use to achieve their goals. The strategy is to choose different activities from competitors, seeking a competitive advantage.

## 5. Final considerations

The management of intellectual capital is considered to be the process of extracting the value of knowledge, which can generate profit for the organization, while intangible

resources are considered intellectual capital (Rodrigues *et al.*, 2009). In this context, when describing the methods of evaluating intangible assets and intellectual capital, which are related to organizational knowledge, it is believed that this information could bring profits to the organizations, as well as facilitating their management.

The objective of this research was to “Analyze the methods for evaluating intangible assets in the context of business, economic and strategic management”, which was reached in the “Data analysis” section. The methods that have “strong adherence” to a given management context are presented. It was decided to highlight the “strong adherence”, since it is considered to be more relevant if any organization has an interest in applying a certain method of valuation of intangible assets, being able to do so in accordance with its objectives and in the most appropriate context.

As for the contributions of the study, it is believed that some findings may contribute, for example, to know which method is most appropriate for public or private sector companies; or which methods report their experience of practical application and which are theoretical models (without application, according to the literature studied for the elaboration of the present research). It is considered that such results may be relevant to the organizational environment if any company has an interest in evaluating its intangible assets.

Unfortunately, it was not possible to delve more deeply into all methods of evaluating intangible assets, as there are a large number of publications on the topic and also a great diversity of existing methods, which concludes that this is a topic that is constantly addressed by researchers.

According to Hoss (2008, p. 12), it can be said that there is a gap, due to the scarcity of empirical research, as well as the fact that some methods are flawed because they are based on two false premises. These assumptions consist in considering that the book value reflects the economic value of the company, as well as believing that the market value is correct. The author also states that “the fundamental point in company valuation processes is the valuation of intangible assets.”

As a suggestion for future research could be compared and/or detailed the methods presented for a limited number of authors (or a single author) or in a given time period. It should be emphasized that in the present research there was no choice (delimitation) of a particular and specific method to be studied. In this case, the suggestion of future comparative and more detailed studies is reinforced.

Moreover, because it was a theoretical research, it was not possible to confront empirical data with the presented theory, restricting the work to theoretical comparisons and critical analysis. Thus, future research can be carried out seeking other realities beyond those described in this study, comparing and expanding the results and knowledge on the subject in question, as well as conducting empirical research.

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#### Corresponding author

Marilei Osinski can be contacted at: [marileiosinski@gmail.com](mailto:marileiosinski@gmail.com)

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