

Integral Analysis as System of Measurement and Management of Intellectual Capitals in Companies

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Abstract. *In the knowledge society, it is necessary to have new approaches of measurement and management for all the intangible ones that generate value, not only for companies but also for the national, regional or local territories. The most widespread methods have begun in the business area; these are support to the macro systems implemented in the last years, under the hypothesis of the knowledge as newly generator of wealth. In this context, let's sense beforehand the method of Integral Analysis as valid system for the measurement of the intangible capitals in the organizations, with advantages on his promoter: the Skandia Navigator; also, as tool for the management, planning and strategic control, advancing on the Balanced Scorecard.*

Keywords: intangible capital; scorecard; strategy, growth.

JEL Codes: M10, O32.

REL Code: 14C.

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1. Introduction

Globalization and competition require organizations to survive, not focusing exclusively on produce short-term benefits. But it should develop the capabilities to make progress in the future, although it supposes a decline in their actual income, being right way, because they invest in factors that will generate future values. This is one of the fundamental reasons why companies must develop a tool that enables them to learn from the past, questioning the present and ensure the future.

Measurement system has traditionally been the financial, primarily the developed from the accounting system (annual accounts, budgets, financial analysis...) because there was an excessive emphasis on short-term results. In this sense, companies invested too little in creating value, that is, in long term (intellectual and intangible assets) that generate future growth, as for example, process improvement, development of human resources, information technologies, database and systems as well as relations with clients and market developments. Therefore opting for a long-term vision requires a system of information you provide us measurements, which implies both financial and non-financial indicators.

But also, in a global economy in knowledge society ever magnified the strategic decisions taken by a company. There are many organizations, and particularly small and medium-sized businesses, which not arise if the strategy adopted is appropriate, if they have it, bearing in mind that strategic errors can be highly damaging for organization, and even threaten the very survival of the times. In addition, strategy could exist but not having established successfully policies to achieve them. Therefore, we have developed a method that integrates all of the above that we have been called 'Whole or Integral Analysis'.

In this work, we analyze the overcoming of the two main models of measurement and management in business by our methodology: Skandia Navigator by Edvinsson and Malone (1997) and Balanced Scorecard (BSC) by Kaplan and Norton (1997), respectively. The first, since it is a vision deterministic and closed. In second case, because strategic vision is incomplete, draw a priori strategy as optimal and not to raise its control beyond compliance on indicators.

2. Intangible capitals and integral analysis of an organization

Nowadays the enterprise management from a vision in the short and medium term focuses on having sufficient assets to facilitate development of an appropriate growth in profits and in turn generate cash flow. However, and

since a genuine long term vision must be borne in mind that there are a whole series of intangible assets such as training, improvement of client relationships, our processes, innovation, etc., which constitute the premises that favor a better position to future factors. Therefore, it is necessary to balance both visions occur so as to achieve the strategic or real value of company.

From this method that diagnose whether the organization follows the right way, we incorporated a new system of management that produces an effective decision-making process both short as long term (Figure 1). Methodology produce it is called as Integral Analysis (López and Nevado, 2006).

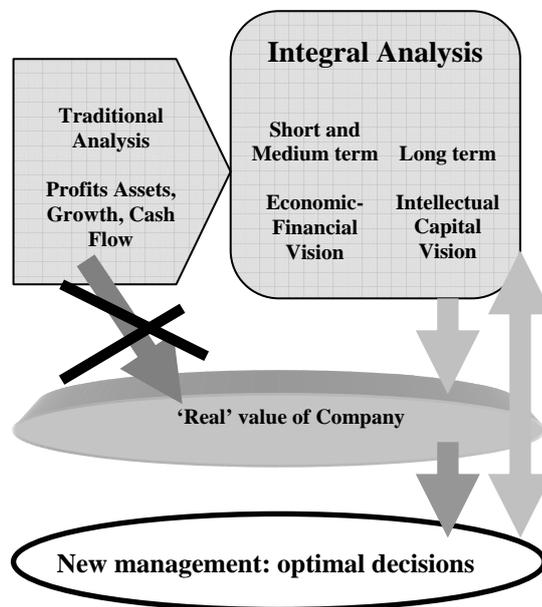


Figure 1. Evolution from traditional to integral Analysis

Thus the measurement and management system is defined as: “*method of knowledge business for the development of knowledge business, i.e. this informative and management procedure covers from estimation of indicators and internal and external ratios up to quantification of other intellectual capital meters for determination of the most real value of a company. Final objective is to carry out an 'effective management' to reach future value and plan strategies that maximize it in long term, making a stronger position in sector where operates the company.*”

Although the above concept is somewhat complex and academic, is the fruit clothing and implementation of this method, it is difficult to ignore or

better generalize the exposure of its many benefits and features. We will therefore analyze this definition by parties.

First, we said it was an informative procedure and management. Informative, because it provides information, and therefore proposes means to obtain the necessary data for decision-making and systematizes methods used in knowledge of economic-financial company and sectors where it operates. Information is reflected in indicators associated with monetary and nonmonetary perspectives (percentage scale) arising mainly from standardized sources (financial statements), informal (internal accounting) and observational survey (interview).

On the other hand, is or is not developed for the management, i.e. does not display a set of values added as simple exposure, but it offers the prospect of control and decision supported trend analysis indicators and comparative values achieved in the sector in which it operates. Thus, it is a real “control panel” for operating and controlling the company, since it incorporates a series of visions of intangible assets that enable improvement management of prospects considered as human resources, internal processes, clients, or methods of communication and business innovation.

It is also a procedure which aims at “effective management”. Whole or Integral Analysis is a management procedure which is characterized by its effectiveness. In this sense, we are referring to the scope of those results that allow us to generation of value future. Therefore, it is possible that their achievement is at the expense of investment in factors with high “cost”, but that actually they are genuine generators of value for our organization. This assimilation cost towards investment allows you to speak of efficacy in the same sense as efficiency.

Finally, it covers strategic planning towards seeking competitive advantage and better sectorial positioning that will allow to discern if the established strategy was the ideal, as well as underpinning the guidelines to follow in the future. It is therefore a useful tool for auditing strategy.

In short, some of the most relevant issues which resolve this method are:

- From results of previous financial analysis, how influence these values in the future of main accounting aggregates?
- What market share is reached and achievable in a product or service?
- What profitability is obtained in a given segment?
- What are the most efficient distribution channels, and future financial requirements?
- What are intangible assets (intellectual capital)?, and what can be done to improve its structure?
- What dynamics of knowledge presents the company, in the transformation of tacit on explicit?

- What is strategic value of a company?, and, in this line, how does it relate with intangible assets?
- How to submit and manage the intellectual capital to increase the value of a company?
- What is culture and organizational knowledge?
- How is corporate strategic planning?, in other words, what strategies should keep and which develop in medium and long term to increase the value to all *stakeholders*?

Integral Analysis is and focuses on a group of measures deliberately selected and implemented to enable to achieve and communicate a shared vision of organization strategy for the future previously recorded, getting a balance Integrator different factors necessary to achieve it. Fundamental features of method as Strategic Control System (SCS) are synthesized in trilogy of economic-financial vision, structural analysis and strategic management of intangible assets, and in models tools for estimation relationships between them and simulation (Figure 2).

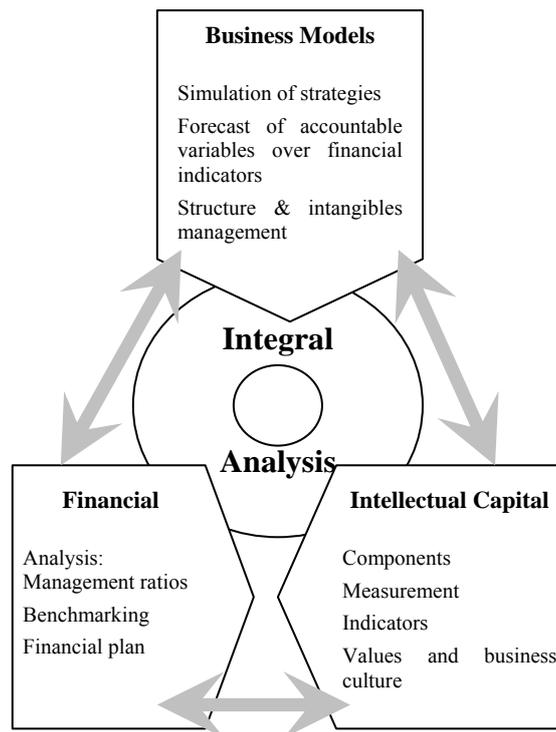


Figure 2. Integral Analysis: visions of SCS

3. Measure intangibles: from navigator to generator

It is necessary to use method known as Skandia Navigator by Edvinsson and Malone (1997) as inspirer of methodology presented as Integral Analysis. In this holistic system of intangible measuring, the concept of value is simultaneously inspirer and objective.

Skandia AFS is a Federation of financial organizations with headquarters in Sweden and leader in the sector. This company operates at UK, USA, Germany, Spain, Colombia, Switzerland, Luxembourg and Hong Kong. At the beginning of the 1990s, in a project to understand their real or market value, it developed a Department of Intellectual Capital, led by Leif Edvinsson. To do this, define and analyze intangible assets as variables that respond to the hidden value in accounting systems. The conclusion is that this capital is the gap between the value of books (account value) and market is willing to provide for the organization. They arguing that accounting does not respond to the market price and that is the value of intangible assets or intellectual capital which determines the difference between those values.

This way, intangible assets (human and structural) determine capital intellectual and therefore complement value system's accounting, generally positive for aggregation allows the calculation of the value of real market company, i.e., that:

$$\text{Accounting value} + \text{intellectual capital} = \text{real market value}$$

On the other hand, model of desegregation of intellectual capital is:

$$\text{Intellectual capital} = \text{human capital} + \text{structural capital}$$

Thus, they close management system of intangible assets as complement to accounting one and necessary for determination of any organization's value. This approach is the source for the system that we showed as Integral Analysis, though, from our perspective this model is not complete, and is not exact.

Before a speculative market indeed nothing model can provide, when is corrected values downward by upward movements of speculation, or the progress of the economy goes into recession cycle and correcting the value of the action in the market for non-consolidated expectations, the value of an organization can be modified even moderately, and however, these factors are not in Edvinsson' equation.

Moreover, identification of intangible assets on a battery of indicators can not be exact, there is an percentage of error committed in the process, as well as a

lack of knowledge of all variables involved in the generation of an intangible that determine its randomness in essence and that responds to an amount that we can refine conceptually as non explicit capital. Thus, integral market value for an organization is now defined as:

$$\begin{aligned} & \text{Accounting value} + \text{intellectual capital} + \\ & + \text{measurement errors} + \text{speculative factors} = \text{Integral market value} \end{aligned}$$

And moreover:

$$\begin{aligned} \text{Intellectual capital} = & \text{human capital} + \text{structural capital} + \text{non explicit} \\ & \text{capital} \end{aligned}$$

Thus, Edvinsson vision is completed with Integral Analysis and we can show the system not only of measurement, but also of identifying and separating the factors derived from knowledge management of market ones that respond not controllable variables by the organization. Furthermore, the system for measuring the intellectual capital allows now to check the degree of certainty of result, and may, where appropriate, rethink indicators that determine the calculation factor human and structural system.

On the other hand, if we focus on how to measure intangible assets, these models are based on the activation of certain items referred to as an expense in accounting information system. Thus, a company makes an expense when you get a real consideration of outside, i.e. when collecting goods or services. Thus incurs an expense with labor workers, training, uses software tools acquired from third parties, hires a campaign advertising, etc. Amount of these goods and services reduces benefits and accounted it operates negatively and decreased the organization value. In this sense, we understand an intangible asset as any element that has an intangible nature (usually without substance or physical essence) and it has ability to generate future economic benefits that can be controlled by company.

In this way, approach of Edvinsson's multiplicative process that delimits an intangible from the product between an absolute indicator (an expense in accounting in many times) and the level of efficiency or utilization of the same one, will not make but “activate” any items of expense in the degree of utilization of the management of knowledge incorporated by organization, that is to say, to redefine the expense in a low quantity being the rest an investment or intangible assets. For example, if a training course is € 1.000, and use or efficiency level of this course is 30%, only € 300 will be activated, the rest will have “correctly” considered as a countable expense.

Synthetically, this is Navigator by Edvinsson method. We have developed it mathematically for the proposed measurement of Integral Analysis, but supports the idea of activation costs as real investment and, therefore, intangible assets that will bring closer organizational market value estimate.

Thus, deterministic Navigator by Edvinsson (equation 1) is restated as a stochastic generator (Integral Analysis), according to equation 2.

$$MV - BV = C_h \times i_h + C_s \times i_s \quad (1)$$

$$(MV - BV)_t = \beta(C_h \times i_h)_t + \gamma(C_s \times i_s)_t + \delta(C_{ne} \times i_{ne})_t + u_t \quad (2)$$

Where MV and BV are market value and books or accountant value, respectively C is the absolute indicator, generally a expenditure capable to be activated in relative terms in the amount indicated by "I" (in percentage scale); being "h", indicative of human, "s", the structural or non-human, and "ne" non explicit. On the other hand, β , γ , δ are coefficients that quantified the relationship with extra countable value or the difference between market value and books value, and t collects a set of observations over time, usually, frequency used for generator has been annual or semi-annual. Finally, random variable u, collects not controllable, speculative and market factors as well as errors of measurement, introducing null average, constant variance and no correlation.

As we can see, we have developed from Skandia Navigator a management information system. It admits stochastic approach, temporal vision and it is an open system of measurement and management that we have been called intangible generator in Analysis Integral System.

4. Management of intellectual capital: from "control panel" to simulator

In recent years, *Balanced Scorecard* concept has arisen in management area (BSC). It is published by Kaplan and Norton (1992). In its origins, main novelty was establishment of four perspectives that are vital to development of any organization, analyze the results obtained in them without giving them higher priority to each other. Subsequently it has evolved as a comprehensive strategic tool (1996). BSC translates the mission and strategy on objectives and indicators organized in four perspectives: financial, client, internal processes, training and growth, which allow a balance between objectives in the short and long term, wished results and inductors of action of these results, and finally between objective harder measures and softer and subjective ones.

Therefore, there is a vision and a strategy explicit in the basis of the four perspectives, and for each are made strategic objectives, indicators and action plans. BSC is not only a record of results, but also an indication of wished results illustrating business plan and mission of the various units (departments) of the company.

A series of steps which would start by setting, vision and mission of the company are necessary for its preparation. Subsequently, we have to identify key factors and internal and external analysis to define strategic objectives for each of the four perspectives. Indicators are then chosen for those who are able to focus on strategic objectives. Thus, BSC globally will be generated. From global one, it will be removed by different departments, trying that everyone goes getting involved in it. To do this, set a policy of incentives linked to the achievement of objectives, formulating standard for each indicator.

This process does not have a clearly defined end, since to get information on the deviations between budgeted goals and the reality of each indicator can be ongoing corrective actions that may affect any of the described steps.

According to exposition, we see that BSC has similarities with Integral Analysis proposed. There are some equivalence between perspectives and intellectual capital components. For example, training and growth = human capital and innovation; internal processes = capital processes; and client = client or relational capital.

Apart from this, BSC model includes finance perspective that represents an enabler agent to attract and train the best people to improve processes and, where necessary, improve the relationship with clients. This perspective is also present in Integral Analysis, because it is considered essential. But unlike static character seen in BSC, Integral Analysis starts a dynamic process by comparison with sector and financial simulations.

From our point of view, both methods are not incompatible, they complement each other. However, Integral Analysis is broader, among other reasons, we comment on the following:

- Breakdown with maximum detail develop indicators, with the “activation” spending (see previous paragraph) point that other models are ignored, and how obtain information for quantification of indicators (organizational database).
- Have a battery of indicators that inform us of the progress of the company, including an alerts system with a dynamic approach, providing a tool for projecting or simulate actions towards future from present, consider its appropriateness and control benefits. It has a feedback system, which facilitates the management and control to

indicate whether translates the performance of strategic in profit or loss.

- Provides a quantification of intangible assets value. Allows management of the factors that lead to a generation of future value, planning strategies and policies that maximize this value in long term, i.e. establishing the correlation between strategy and intangible assets, indicating which should be strengthened or where to avoid that they are “saturated” (over-dimension).
- Integral Analysis, although their objective is not valuation of a company (discontinuous and extraordinary fact), since has no mission to integrate into intellectual capital the present value of future profits of the company, but to see the ability to generate them and if the capabilities that you currently have are being well managed. However, this method allows estimating a reference value of the company in activity (continuous fact), integrating all the achievements and available information by the organization that cause a gap with the asset amount offered from accounting (BV). It therefore would carry out a valuation of intangible assets that can be useful not only for the management but also as information on the organization assessment, for example, in a fusion quantifying potential of intangible assets.
- Integral Analysis is a management tool for organizations, allowing a strategic audit as policy simulator. Other way, determine if selected strategy is appropriate. It is not relevant in BSC, it suppose that is the best strategy (Figure 3). There, Integral Analysis provides information about if strategy is the right one or we must modify it, indicating at same time alternative strategy and the roadmap to attain it (strategic planning).

From this point of view, it facilitates the audit strategy, already that through three visions of Integral Analysis (financial, business models and intellectual capital) is achieved have an approximation right to the company's strategy and determine if it is correct or not. To do this, it is observed the economic and financial position of the company and its sector, questionnaires are developed and performed interviews with a dual purpose, getting of indicators and knowledge of corporate culture is one of the bases of an audit of this kind, since culture facilitates strategic implementation. Subsequently, the part of undertaking which incorporates, allows you to establish a model that fits and is representative of your organization, from the equation 2, so that we get information *ex post* of simulations in order to facilitate decision-making supported structure intellectual capital models of intangible estimated (β , γ , δ). Thus determines whether the strategies adopted are correct and introduces a

strategic design the employer himself control step by step, through the benefits, even if they are worth about what we had of strategic start of simulation.

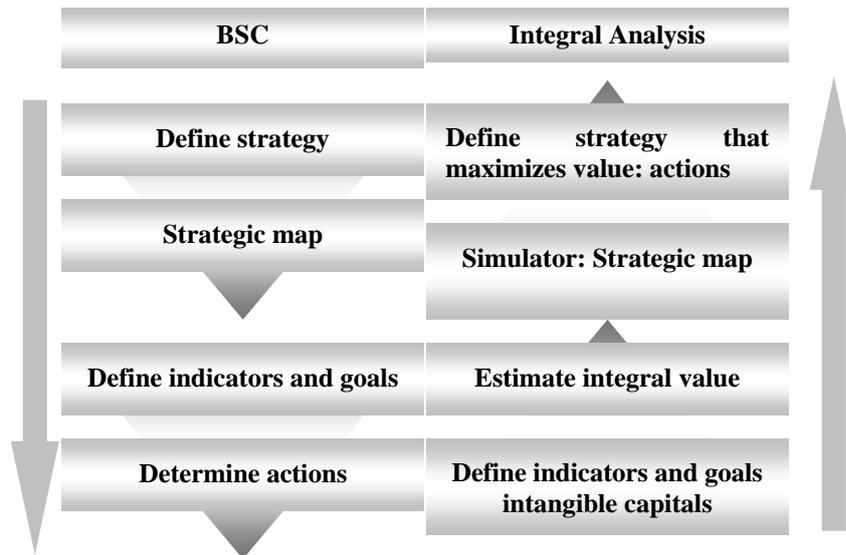


Figure 3. *BSC and Integral Analysis as tools for strategy*

In summary, *Balanced Scorecard* and *Integral Analysis* are complementary tools for strategic management since both consider similar perspectives. However, last one allows planning strategies based on the results of the organization as support and modify them instantly and dynamic, measuring even feedbacks of system.

5. Conclusions

In the knowledge that we find ourselves immersed society we need new information systems to enable better management of resources both within the enterprise as macroeconomic. Thus arise methodologies based indicators primarily targeted towards intellectual capital measurement models, or scorecards. Both systems are complementary and can be applied to both areas but with modifications.

In this respect, proposed model (*Integral Analysis*) allows to measure and manage key responsible for intangible capital growth of organizations or countries. This model provides advantages over the other two models of reference literature: *Skandia Navigator* and *Balanced Scorecard*. Regarding the

first, this one provides a management model and admits the stochastic, temporary vision and presents open measurement system accuracy. On the second, it explains how to develop indicators with a system of warning dynamic casts or simulates actions towards the future, considering their adequacy and controlling their benefits. Also provides a quantification of the value of intangible capital and correlates with the strategy, indicating which should be strengthened or where to avoid that they are over dimensioned.

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