

Strategic Themes For Balanced Scorecard Construction Based On Fuzzy Logic

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Abstract

Balanced Scorecard is a methodology for strategic management with emphasis in strategic, tactic, and operational control. If you don't measure something, you don't manage it. Last statement is a way to emphasize one of the most important assumptions of this methodology that is very well implemented by it. However, BSC can't express strategy in actions, nor translate verbalization of strategic planning, important topics to build an effective Balance Scorecard. This paper defines priorities of topics about strategic planning considering the SWOT analysis - strengths, weaknesses, opportunities, threats – (Andrews, 1971). SWOT analysis is completed considering actions and objectives through Fuzzy Logic theory. The Fuzzy Logic based methodology is an intelligent information system expressed by Espin and Vanti (2005) and completed by Espin, Becker and Vanti (2005). The system, expressed by mathematic formulas, is based in Complexity Theory principles with emphasis in non linearity and is applied here to the tourism industry (a travel agency).

Keywords

Complex Information Systems, fuzzy logic, balanced scorecard (BSC), strategic management, tourism

Introduction

According to (Castells, 1999) space and time, which are the material bases to human experience, were changed as soon as the space flow dominated the space places. Mundane time substitutes the Taylor's industrial chronological era and the new virtual business growth with responsibility. The evolution from an industrial economy to an economy based on information changed the technological skills of using the direct power

production to the superior skills of symbols processing. These are concepts of a new society directed to services, also defined by (De Masi, 1999) when related to tourism services.

At information economy, the logical of business activities are directed to class information production which has high fixed costs, however with cheap and fast reproduction (Shapiro, 1999). It's a paradigm change from the industrial economy to the information economy with intense application of this economy that present itself as information systems (Tapscott & Caston, 1993).

Information controls process and products and reformulates organizational structures, business performance as well as business improvement based on a business strategy definition. Information is a decisive point of competitive advantage to the organizations, therefore redefines all the value chain (Ghemawat & Rivkin, 2000). Information economy establishes an imperfect and turbulent conflict between markets and product prices a time that customers can change their suppliers just with quick research on the web; thus being fragile the management models due to the enterprise operations that are intensely based on information to generate knowledge that results in competitive advantage to the companies. Mainly the tourism area boarded on this paper is significantly characterized on this situation.

The tourist business of attraction and movement depends on the information efficient management. Therefore, is presented here a scientific study that considers the use of intelligence techniques based on information (Turban et al., 2003) to be applied in sector enterprises to define the priority information to the strategic management. An intelligent system or information complex can process with a high degree complexity the

executive speech when may desire to translate the strategy in place, main function of balance scorecard (BSC) from (Kaplan & Norton, 1992) and extended in (Kaplan & Norton, 1997). An important example is the SWOT analysis (Andrews, 1971), used in enterprise strategic planning and many times lost during implementation.

Exactly with statistical variations of a factor to another one, the index of rightness in the strategic implementation is very low and becomes essential to progress in the advice of this thematic one, studying adjusted methodologies more to the management, as the boarded ones in this work. The BSC is one of the used methodologies of international strategic management more in companies of benchmarking, while that fuzzy logic is the methodology that contemplates not accurate reasoning approach, with high degree of uncertainty, portraying the day the day of the complexity of the organizations.

The objective of this work is define the importance of strategic subjects for the construction of Balanced Scorecard (BSC) in scientific way without losing the complexity of the context of the strategic management and with applied practical demonstration in a travel agency, branch of a great Brazilian company. For such, through international partnership between academy and private initiative, an intelligent or complex system of information based on fuzzy logic was developed to take care of the considered objective, which has its presentation and detailing mathematical in (Espin & Vanti, 2005) and extended in (Espin, Becker & Vanti, 2005).

Abstract references

Strategic management

The strategic process can be considered more a chaotic and creative future process

than a rational process. Change, uncertainty, newness and the creation of new knowledge are part of a future strategic process (Mintzberg, 1994). For (Bonabeau, 2002), to foresee the future, the unexpected depends on emergent phenomena that are formed of low for top, initiating of the local interaction of individuals that modify its action in reply to the other participants. Currently, thanks to the technology of intelligent systems of information, some companies are finding ways to evaluate and to predict the emergent phenomenon, which can be compared with complex events such as complicated and mysterious bottling of transit as of the city of Rome. In the wonderful city of Rome look at the traffic seems chaotic where each element has a specific objective, but analyzing as entity or living deeply it is possible to understand the logic to arrive itself at some place. Then, emergent phenomena possess simple rules of individual behavior surprising being able to take the coherent ones resulted. Small changes in the rules or the way as this function can have significant impacts in the results of the system.

What surprises in strategic management is that small and simple rules can generate complex results because these make possible a spontaneous order. Normally, the management's rule of information serves for the decision taking and increase of the enterprise knowledge. So, the company who normally works with networking business needs to be supported for a strategic management that follows the complexity of the world.

The problem is that on the definition of new strategies, executives are more concern about search more data when they should be concerned about the model the strategies belong to. (Chussil, 2005) understands that many decisions are accomplished of wrong way because they are based on trends and trends are not the root cause for future

events. Trend describes situations regarding time, projecting something believe it's going to happen. It is wrong model of taking decisions, because it does not consider the complexity of the environment and the uncertainty of the process.

Strategic management is a continuous and interactive process that should keep an organization integrated on its environment. The strategic management mentions the administration plans to reach consistent results for the organization, according to organization's mission and objectives (Wright et al., 2000). It's also based on decisions and administrative cases that adjust goals and objectives according to the changes that occur in the organizational environment, with a lot of steps to solve problems like environment analysis, organizational goal, enterprise strategy, organizational strategy implementation and control of activities.

Strategic planning

Strategic business planning process estimates the adoption of a formal strategy that the organization can define it, plan it and communicate it for the internal community and for its customers. (Simon, 1965) is pioneer in the emphasis of the strategy definition as a set of decisions that would have to be taken to determine the positioning of an organization in determined period of time. (Porter, 1990) extends this orientation to the positioning and defines some possible strategic positioning to search leadership in the market: cost, differentiation or approach. This positioning search would be related to the competitive forces (Porter, 1990), that would be the basic elements which an organization would have information and determine its action. The information attainment on suppliers, competition, and substitute, new products incoming in the market and on the purchasers would be important to the company to define strategies concerning each one

of these forces.

With the intention of having knowledge of its reality, it is necessary that the company recognizes their strengths, weaknesses, opportunities and threats, the SWOT analysis (Andrews, 1971). SWOT analysis relates to the strategic diagnosis; that's possible define the real situation of the company related to internal and external aspects but the same one it's not directly related to the strategic objectives and enterprise actions. Then this generates implementation problems, therefore the entrepreneurs ask, "Ok, have identified strengths, weaknesses, opportunities and threats, but what can I do with this? How each one relates with what I want in terms of strategic objectives? How do they become what I want for my business and with what can I do with the operational actions?" "These are non solved questions; therefore the models presented in literature consider that the elements of SWOT analysis are combined subjectively by the participants in a disorder way and without connections with the most part of the company's strategic objectives.

The most failure of strategic planning implementation is related with the use of simple definition projects of priorities, defined in group dynamics (average of the voting or the discussion, for example). This work contemplates the interaction not only between the elements of technique SWOT but these related with the strategic objectives and actions, defined for the responsible groups of discussion for the strategic planning and prioritizing the strategic subjects to be represented differently in the construction of Balanced Scorecard (BSC).

No matter if the strategic planning is for ordinary companies or for tourism companies, it is an instrument of strategic management that converts into practical

implementations the different enterprise levels: strategic, tactical and operational. In practice, it's very difficult the conversion of the enterprise strategy in operational actions and many strategic analyses are lost throughout a process many times bureaucratic and delayed. (Porter, 1996) alerted on the problem of the incapacity to distinguish the strategy from the operational effectiveness, this last one generates an exaggerated search for productivity, quality and speed with management tools and techniques as management of the total quality and would reengineering that currently it can evidence on the questioning of a supported yield. Many models are considered in literature and even though in practical implementations but also it would have to validate each proposal.

Tourist management

The industrial economy is transformed into services economy, where the human being lives more, has reduced hours of working and has more leisure time. Then, the economic revitalization resurges through different types of leisure and tourism, providing to the individual a higher consumption of tourist products and services: strolls, trips, gastronomic and mainly life in direct contact with the nature (De Masi, 1999).

For (Montejano, 1999) the tourism can be defined as the theory and practical of all the activities related with the attraction, rendering services and satisfaction of the tourists' necessities. Tourism is basically a set of techniques based on scientific principles that have as purpose to give a series of services to the people who dedicate its time to travel, becoming into a tourist or a hiker. Still as the same author, the tourist management is based on the general economic theory that has well delimited scopes: the macro and the micro economy. The first one approaches the study of the aggregate magnitudes of the tourist economy and its behaviors and Inter-relations in great groups of countries and

regions, expressing themselves by the global and direct or indirect job of the dedicated active population to the tourism, the national income and the position of the national income of the tourism, global investments in companies of tourist services, global tourist consumption, prices of products and services, active population salaries to the tourist sector, demand, tourist infrastructure, verges ingression (rocking of payments), verges payments, rude value of the tourism and tourism inside of the landmark of the Gross domestic product (the GDP).

At micro economy are studied human activities in individual and small group's level, treating to determine the behavior of general economic as an individual synthesis of activities. This study normally it is based on the consumption, the price system and on production to the companies who act in the sector and can be:

- Companies of mediation and commercialization of products and services: they are travel agencies and tour operators, transportation companies (air companies, maritime, fluvial, road transport, and railroad and car rental).

- Lodging companies: hotels, hotel-apartments, motels, pensions.

- Hostel companies: camping, apartments, hostelry, cottage, summering cities, mountain shelters etc, companies of leisure and feeding (bars, restaurants, restaurants of fast food, catering, foods for collectives).

- Other companies: they are the agencies of private tourist information, organizations of congresses, seminaries, tourist animation activities, tourist services sales and entertainment among others.

The tourist market contemplates three issues systematically: (1) what to produce,

(2) how to produce and (3) for who produce, synthesis of the plan function. These questions provide market segmentation and identification of behaviors to the preferences of the tourists. In this direction, the information management acts in significant and strategic way, where it is possible to anticipate and decide investments, as carry through propaganda of the tourist places, where to announce, type of the profile of potential consumer, among others aspects that will be analyzed in practical case.

Brazil, has a trend and it could be affirmed until consolidation of development of new businesses with the sector of the tourism, cities traditionally agriculturists and until industrialized that started to bet in this sector. New courses of Tourism had been launched, many of them with good management approach, new researches are offered and new economic reorganizations try to attract the consumer, with an investment that redeem the history, nature and human potential, sustainable development.

The thematic is well analyzed in (Hall, 1994) and (Hall & Jenkins, 1995) where international policies of tourist development evolves since disaggregating and the rationalization politics, passing for higher governments compromise with the tourist marketing and tourist infrastructure development, until the current continued use of the tourism as instrument of regional development, where agents makes possible to reach the auto-regulation of the sector. As (Hall, 1994), the tourism sector suffers from imperfections regarding the public resources destination, therefore the method to decide who receives what and how not always is adjusted. Thus being, the government oscillates the management of income and wealth in function of measures that act in the price's system. Also, many governmental measures prioritize investments with a short term return like an industry with regard to tourist investment with sustain, whose return is

proportional in the long of the years and this becomes a frustration to the young researchers with thoughts and more heterodox methodologies.

The tourism is a system extremely interrelated that corresponds significantly to the conceptualization of systems (Bertalanfy, 1973). Some types of systems models had been used in tourist studies, but are in geographic terms that it's possible to identify three basic elements, as (Pearce, 1995) and (Leiper, 1989):

- a) Generated region is the tourists region of origin and the place where the trip starts and finishes.
- b) Route or region of transit is the region for which the tourist must travel to reach its destination.
- c) Destination region is the region that the tourist chooses to visit and in which the most obvious consequences of the system occur.

The basic model of tourist system is useful to identify the tourists' flows of generated region to the destination region. It can have more than one destination; therefore, a destination standard regions and routes of transit can be formed, as well as support logistic and welfare to the movement of the tourist.

The attraction tourist business and people movement depends on the efficient information management. (Beni, 2001) develops a structural analysis of the tourism detaching a systemic and holistic vision that must be significant for the new businesses tourists' generation. The author affirms that each variable of a system interacts with others in a so complete way, that cause and effect cannot be separate and that the relationship is the key of this holistic agreement. The structure of this occurs thru the

management of intelligent techniques of decision taking and the relations of cause and effect and in accordance to (Hall, 2001) is possible to identify three basic forms of relationships in the tourist systems: (1) a relation in series in which A takes to B, that is the characteristic relation of the type cause-and-effect of classic science, (2) a parallel relation, in which two elements are affected by another element, and (3) a relation of feedback, that it describes a situation in which an element influences itself exactly. These relationships and elements are part of the environment, which can be shaped recognizing the important elements that affect its operations. It is the definition of the representation of the BSC defined for (Kaplan & Norton, 1992) and (Kaplan & Norton, 1997). However, for its construction, mainly in the definition of the strategic subjects related to BSC is that an intelligent or complex system of information presented in (Espin & Vanti, 2005) and extended was structuralized in (Espin, Vanti & Becker, 2005).

Strategic management in the tourist sector

The tourist management which is converted into classic and formal strategic planning is concerned in detailing plans and goals in function of a future objective, while that is more adjusted is develop a systemic and cybernetic planning, contemplating more flexible the goals, to the continuous information, the projection and the simulation of future events, the evaluation, the choice and continuous monitoring.

People are familiar to the following stages of the process of tourist planning: identification of problems and options; fix goals, objectives and priorities; collect and to explain data; prepare plans; sketch implementation programs; evaluate plans and programs potential; review and to adopt plans; execute the plans; manage implementation programs and monitoring its impacts. Even if the stages are done, must care about

elaborate a planning that still contemplates the uncertainties of the environment, and for this, the majority of the models presented in literature finishes failing in its practical implementation, because they are changed into long reports with research of all type.

The BSC contemplates the strategic management and represents well its strategic planning, even following its conceptual orientation in the practical it still presents definition problems of the strategic subjects, question this boarded in the present work. Then, through the intelligent structure or complex system of information the BSC can be used by managers, in more dynamic and brought up to date way, thus making possible to carry through simulation of different scenes in the enterprise performance. The present work approaches the subject of the enterprise complexity, of the uncertainty that must be incorporated the BSC through the methodic approach of fuzzy logic (Zadeh, 1965), whose pioneer, Prof. Zadeh already relate it, being followed for Prof. Kaufmann of operational research, who also was worried about the limitations of the referring methods of optimization to the subjectivity human being. The proper Aristotle assumed that a proposal can be true and false at the same time in a condition to assign a degree of truth and a degree of falseness. The related methodology fuzzy logic contemplates in differentiated way the dynamic power to decide, consequent process of a cybernetic and interactive tourist planning.

The strategic tourist planning process identifies component-keys that are part of an inserted formal planning in an environment influenced for different reasons: (1) requirements of the interested people, (2) perceived necessity, (3) reaction ahead of the crisis and (4) adaptation, innovation and diffusion of ideas (Hall; McArthur, 1998). From the ending and the strategic planning hand in form printed, this would have interactive

and adaptable to have the external and internal forces that affect it. Every time the environment changes, the instrument of strategic planning also would have to move, and is at this moment that the problems may occur, therefore many companies changes the model of business, but they do not modify the strategic planning. The direct consequence of this is the distance between the cultures of who carries through the activities day to day with the one of who manages the company. The lack of planning will be able to cause a bad management or lack of managing sector of the tourism and with this the extinguishing of diverse natural resources, thus making impracticable the commercialization and the determined abandonment of the demand for local.

Rose (2002) already evidenced this concern. However, an adequate and structuralized planning, with definition of strategic priorities, can also become a competitive differentiator for a country, the opposite it becomes an activity that does not add no value to the business and the sector, much less the communities that can usufruct of related sustainable growth.

To cite an example, in (Acerenza, 1992) and (Bissoli, 2000) is presented a tourism model called Gunn Model that was developed in 1976 and 1977, based in the concept of tourist product that understands four phases:

Phase A: Analysis of potential and existing tourist flows and the main places and areas of tourist interest.

Phase B: Setting of the tourist politics and determination of the with priority tourist flows.

Phase C: Preparation of a physical development plan and election of strategy for implantation of the programs.

Phase D: Analysis of the impact of the probable repercussions of the development and its effect on the environment.

The model is guided for the physical planning of a locality than to the tourist activity as a whole. Objective of the Gunn model is to demonstrate the recognition of diverse factors or components, on which depends the tourist development and has its process supported for a planning of five phases:

Phase A: Definition of objectives.

Phase B: Basic research information for the taking of decisions and familiarization of the participants of the process of planning with the situation region in study.

Phase C: Syntheses and conclusions of the situation found during the research of the physical factors and physicists and not to formulate conclusions related with the possibilities of tourist development that the region presents.

Phase D: Definition of concepts of development to foment the activity tourist.

Phase E: Recommendation of the tourist development of the region.

It is an intention model, of formalization, of plans, but of difficult implementation because it is practically impossible to process too many phases and unequal at the same to take a decision, mainly when an entrepreneur goes to the market to act as its business. Then, formal plans structuralized in cause relations and effect with the BSC and lined up to the intelligent structure or complex systems of information, become possible to potential in sustainable way the growth it tourist sector. But in more scientific way only "mozambo" will be prevented to explore the way economic.

Following the reasoning of strategic thinkers in management as Simon and Porter,

(Hall, 1992), (Veal, 1992) and (Dror, 1973), planning can be understood as a decision process, therefore plan is a process to prepare a set of decisions to be accomplished in the practical in the future, directed for the fulfillment of preferred goals for the perfect ways. However, the tourist planning process does not treat only to decide what must be offered in the future to one determined geographic area or the community. The subject is more complex and for (Chadwick, 1971) the planning also is a process of human thought and the action based on this thought (present, passed and future), that is, a human being activity.

Friedman (1973) conceived two different types of planning: (1) relative planning to the development: high degree of autonomy to define objectives and ways and (2) adaptable planning: the majority of the decisions depends very on action of third that they do not belong to the planning system. Both however are come back to the future and contemplate periods of time for projections, necessities of analysis and continuous evaluation, calculations of expectation associates to the declarations on future, adoption of a structural system of planning and analysis of flexibility due to the degree of uncertainty of future events.

The present work relates the adaptable planning looking for to contemplate flexibility regarding to the degree of uncertainty of future events. For in such a way, the tourist manager needs to congregate with different technologies of intelligent considered information and communication in the treatment of the information so that it can decide with flexibility, contemplating uncertainty aspects that characterize the day-by-day of the current organizations. With the use of intelligent or complex systems of information it is only possible to reach this level of flexibility and uncertainties, otherwise are attempts to

manage a business based on base and error, or either, everything based on experiments and with almost null scientific organization.

The Balanced Scorecard (BSC)

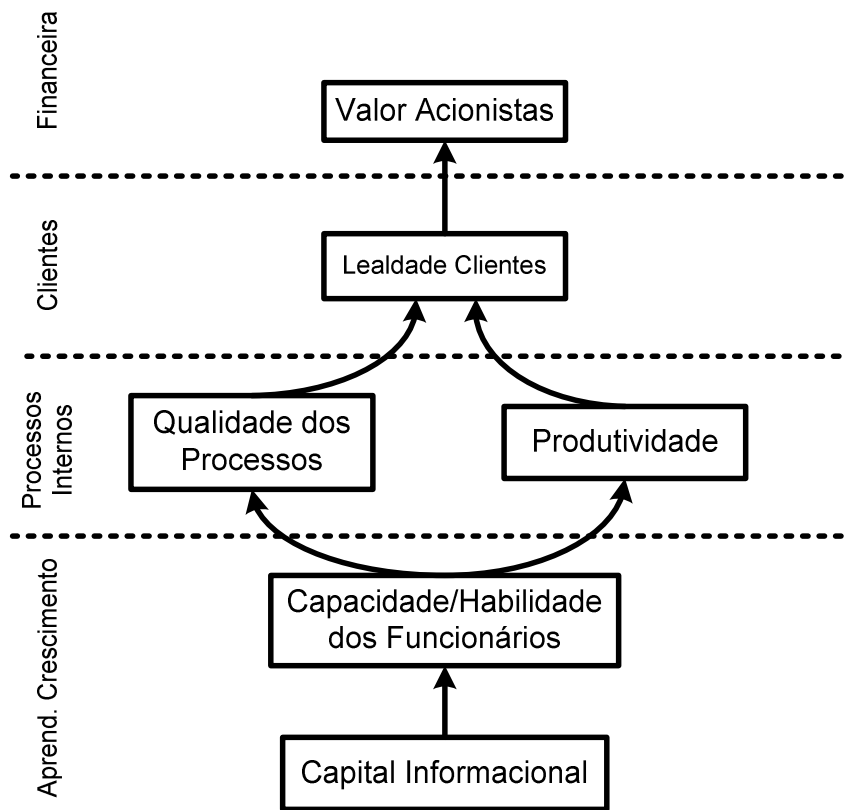
For Kaplan & Norton (1992, 1997), Balanced Scorecard (BSC) manages the strategy measuring it through panels and later representing objectives in strategic maps. The BSC complements passed financial performance analysis with measures that stimulate future performance. The objectives and measures of scorecard derive from the company's strategic management who focuses the organizational performance under the perspectives: financier, of the customer, the internal processes and learning and growth, which form the structure of this important methodology. The BSC already is considered a new model of management, therefore it makes possible critical managing processes related to clarify and to translate the vision and the strategy, to communicate and to associate objectives and strategic measures, to plan, to establish goals and to line up strategic initiatives and to improve feedback and the strategic learning.

The BSC translates companies' mission and strategy including set of performance measures that are base for a measurement and strategic system management (Kaplan & Norton, 1997).

Despite the system measures and preserves traditional financial measures, the system directs the financial measures with perspectives that they stimulate for a future performance, including financial objectives of short, medium and long term to the desired economic result be reached, reflecting the companies life cycle to evaluate if it has possibility of growth, maintenance and collect of the strategy. The perspective of the Customer guides the organization to fidelity the customer, in its satisfaction and the

search of new customers, markets and products. Internal Processes perspective for the consumers deals with the chain of activities, becoming accessible through products, knowledge and services, extending the limits of the organizational strategy, allowing that all of the company can participate of the productive process. Perspective of Learning and growth aims at to identify to the necessary intangible assets to the exercise of the organizational activities and relations with consumers involving functional satisfaction, productivity, retention, organizational climate, dense culture.

The BSC has the function to get organizational consensus, focus the strategy and communicate to all the company members the strategic management. In a simplified way the strategic map of the BSC is represented. A BSC structure pursues clear and simplified stages of involving definition of Objectives, pointers, goals and action and later the representation of the strategic maps in cause and effect diagrams. Normally a BSC contemplates from 20 to 25 objectives, which can provide to the manager an agreement and a strategy measurement of the company. Each objective is constructed around different pointers of performance. Small entrepreneurs only focus the pointers because in the majority have an only objective, of return on investment, not valuing other objectives in more harmonic way to reach cited financial perspective, this as a consequence of action of other perspectives.



PICTURE 1: Simplified Illustrative examples of BSC structure

Technique of inquiry and application in the tourism sector

The studies in tourism follow a multidiscipline boarding that many times involve areas like administration, psychology, economy, geography, technology, and others. The tourism does not configure as an independent area, it needs this interaction, this dynamic work. The most used technique is of the interview in depth that is communicative construction of a social landmark in the accomplishment, where the interviewer records the interview and stops later transcribing it to the final text. An advantage of recording the interview is the capture of an immense wealth of commentaries on determined subject.

The interview must be managed to keep a basic known on communicative

relation, shared between interviewers and interviewed in the establishment of the subject in question and objectives of the dialogue (Giddens, 1991). A verbal interaction must be considered which configures for a negotiation between people regulated by a landmark or referential territory (Goffman, 1979), where a reference of the subject be established.

When is regarding the implementation of the strategic management in strategic planning the problem of how transport the verbalization collected on the deep interview in a quantification that could be better measured and analyzed and these constantly are brought up to date in function of the business dynamic that if is inserted. The equation seems to be simple when it works with averages in function of the boarded questions, but of high complexity when this equation is inserted in the day-by-day of the organizations.

The relation: Strategic Management Strategic planning BSC cannot be synthesized in reports or systems that follow a bivalent logic or 0 or 1. It is well-known knowledge that the dumb model of business abruptly which had to the market uncertainties (due to transitory liquidity or other aspects) and all the analysis or the carried through verbalization would have to move quickly, as also all the system of management information. Therefore, this work analyzes and presents in practical way an implementation of power systematization of making decision process from the tourism strategic management using itself as a multivalent logic of called decision fuzzy where it extends binary model classified by 0 or 1 $\{0, 1\}$ for a model between 0 and 1 $[0, 1]$, between degrees of Truth and Falseness between each one of the relations studied in the strategic management of a travel agency as example form.

This type of system also was presented in application form for an agricultural import company in (Vanti et al., 2005).

Fuzzy logic

The fuzzy logic is seen as system concepts, principles and methods to deal with ways of reasoning that are more approached than accurate. It allows representing values of intermediate relevancy between the values of true and false of the classic logic and can be applied in different areas of the human activity. Fuzzy is based on “good”, “bad”, “capable”, “efficient”, etc. However, relating changeable linguistics it can be created a diffuse proposal in order to measure the level of truth or relevancy between different variables. (Espin & Vanti, 2005) have applied the methodology fuzzy logic and have developed a system applied to the strategic planning and the BSC, whose system references the practical application of the present work. This system was extended later in (Espin, Vanti & Becker, 2005).

The advantages of it using fuzzy methodology for the decision taking are that a developed system in this way considers possible answers of uncertain reasoning with the representation of possibilities in degrees of uncertainty (Klir et al., 1997). The advantages of the logic fuzzy or diffuse, according to (Mukaidono, 2001), is that in many cases, the mathematical model of the process can not exist or can very be "expensive" in terms data processing and memory and a system based on empirical rules can be more effective.

The recovery and analysis of information using the related technology occurs incorporating decision intervals that make possible the borrower of decisions to get a bigger flexibility in day-by-day. In this system, the facts can be represented by diffuse sets through inference mechanism of the human knowledge. The development of discipline and technologies as artificial intelligence, the automatic control, psychology, sociology, the business-oriented economy and the administration in general demands

constantly the necessity of formalization of the inexact, vacant or express knowledge exclusively in linguistic way. For this, the diffuse mathematics relates well (Dubois & Prade, 1980). In such a way the interviewed answered the questions that do not consider or reply to another one, but degrees of truth and falseness between different crossings or matrices. The picture below presents the values of truth with corresponding categories:

Truth values	Category
0	False
0.1	Almost false
0.2	Plenty false
0.3	Something false
0.4	More false than truth
0.5	So truth as false
0.6	More truth than false
0.7	Something truth
0.8	Plenty truth
0.9	Almost truth
1	Truth

PICTURE 2: Values of Truth

Following are presented the pictures with the collected verbalization as an interview result of strategic planning of a travel agency, but also presented in quantitative way, later to be processed and presented the results with its had analyses.

Practical application - Travel agency

Travel agencies are considered essentials for the tourism market, therefore they are they who intermediate offer and demand of the services of this sector. Due to the

great growth of the ways of transportation and lodgings, travel agencies expand with great easiness in the market, it's hard to accurate the amount around the world. Integrated in the infrastructure of the tourist services, the agencies are the points of planning, organization, sales and systematic diffusion and technique of the tourist products (Andrade, 1992). The travel agencies and tourism occupy a position of leadership in the industry of the tourism for stimulating the act to travel (Gelas & Milone, 2000).

Due to offer and demand and the great competition, the agencies do not work anymore as a segmented form; need to offer all the products that the competitors also have available for the commercialization, to do not lose market and money. The travel agency structure is usually is shared in: accounting department, planning department, advertising and marketing department and information department. The info department must be always updated with brochures of trips and publications of instruments and companies specialized in the branch, guides and scales of transporters of all the types, brochures and projections with classification and prices, manual with specific norms referring to the international wallet of qualification; visas; location of vehicles; passport, tourist notice and curious data, magazines and periodicals of national and international circulation.

To Gelas & Milone (2000) the branch of travel agencies is in great economic ascension, for dealing with services rendering companies, where its main characteristics are: intangible, inseparable, dissimilar and perishable. The services rendering of the travel agencies also consists in customers and suppliers fidelity work, therefore all this work is based on much confidence between the parts.

There are some facts in the tourism branch that we can observe this kind of

confidence entailment. For the same authors above cited, customer makes the acquisition and pay in advance for the service without having idea of service quality which is paying for. The suppliers work based on this confidence because almost all work through reserves, some keep the reserve until some hours before the installment of the service, others until the final moment.

The travel agencies had its origin in the market as mainly as intermediate between the customers and the companies who supply directed services to the tourism as: air companies, hotels, car rentals, etc. According to Gelas & Milone (2000) the professionals of the agencies, known as trip's agents, besides selling tourism services give to its customer's important information like: visas, exchange, ways of transport, climatic situation, among others. They give a consultant service regarding to the option of trips for the customers who many times do not know the cities for where they intend to travel. The travel agencies also give to services of events for legal people and community. Generally are services like: excursions, congresses, seminaries and community periodic parties. Then, the potentiality of increasing the competitiveness of this type of company is very significant when the performance of the professionals is carried through the awareness of the strategic management and its current implications.

Strategic analysis for a travel agency for the construction of the BSC

The analysis is inserted in a bigger research of structure and validation of strategic maps for the sector of the tourism. The research refers to a travel agency of a group that had the survey of strategic information carried through in the year of 2004 with the participation of student of the course of Administration of the Universidade do Vale do Rio dos Sinos (Unisinos). The collected data are represented in the pictures below:

FO1 = Well remunerated employees
FO2 = Subsidiary's company rename
FO3 = More than two decades on the market
FO4 = Service's differential
FO5 = Vouchers and lodging delivery
FO6 = Attending
FO7 = Personalize tourist services
FO8 = Price and payment terms
FO9 = Tourist station in large customers
FO10 = Agent's service on international trips

PICTURE 3: Forces

FR1 = Low professionals with experience on tourist administrative sector
FR2 = Lack of information on internal procedures
FR3 = Financial dept concentrated on the matrix
FR4 = Excess of bureaucracy
FR5 = Tasks accumulation
FR6 = Demand higher than serving capacity
FR7 = Lateness on invoice's delivery
FR8 = Failure on accounting
FR9 = Restriction regarding suppliers incentive do employees

PICTURE 4: Weaknesses

OP1 = Good use of Shortage on competitor's serving
OP2 = Inland alternative destiny's and ambient tourism
OP3 = growth of Small and medium companies
OP4 = Long term payments

PICTURE 5: Chances

AM1 = Increase of publish on mass communication
AM2 = Direct competition with large international companies
AM3 = Bureaucracy adjustment to the customer needs
AM4 = Sale's Limit to international trips

PICTURE 6: Threats

To amplify the importance or ranking analysis of that the company should priority at the moment of the interview in its strategic process, had also been defined the strategic objectives and action so then it can quantify all the crossings and thus to execute the due processing of the developed system.

OBJ1 = Modify the packages distribution by specialize agencies
OBJ2 = Increase the products offer to small and medium business
OBJ3 = Publish the long term payment thru a bank
OBJ4 = Consider the real customers' need

PICTURE 7: Strategic Objectives

AC1 = Work in group for late tasks
AC2 = Pending items resolution
AC3 = Visit the customers
AC4 = Cashflow
AC5 = Daily meetings

PICTURE 8: Action

From the executive verbalization was constructed then the matrices that quantify the strategic relationships of strategic matrix, objective SWOT and action. To break of this relation everything it is processed in joint way:

- First SWOT between itself and relative Presences;
- First SWOT before each objective;
- Action before each objective;
- Objective before each objective, or either, what each objective impact the others.

After all these crossings the processing generates a table of degrees of truth for each one of items involved in the strategic management for the construction of the BSC, as picture 9.

SWOT	OP1	OP2	OP3	OP4	AM1	AM2	AM3	AM4	Presença
FO1	0,8	0,3	0,5	0	0	0	1	0,9	0,7
FO2	0,9	0,5	0,8	0,9	0,9	0,9	0,6	0,6	0,8
FO3	0,8	0,5	0,7	0,8	0	0,9	0,1	0,6	0,7
FO4	0,7	0,6	0,7	0	0	0,7	0,7	0,6	0,8

FO5	0,7	0,3	0,9	0	0	0,6	0	0,2	0,8
FO6	1	0,5	0,9	0	0	0,9	0,6	0,7	1
FO7	0,9	0,5	0,8	0,7	0,2	0,7	0,2	0,6	0,7
FO8	1	0,7	1	1	0,2	1	0,8	0,7	0,8
FO9	1	0,6	0,8	0	0	0,8	0,8	0,4	0,7
FO10	0,9	0,1	0,8	0	0	0,8	0,2	0,8	0,8
FR1	0	0	0,1	0	0	0,7	0,6	0	0,4
FR2	0	0	0,1	0,6	0	0,6	0,8	0	0,2
FR3	0,8	0	0,7	0	0	0,9	0,9	0	0,1
FR4	0,8	0	0,7	0	0	0,8	1	0,1	0,7
FR5	0,7	0	0,8	0	0	0	0	0,1	0,6
FR6	0,9	0,5	0,9	0,6	0	0,9	0	0,6	0,6
FR7	0	0	0	0	0	0,8	0,7	0	0,5
FR8	0	0	0	0	0	0	0,5	0	0
FR9	0	0,6	0	0	0	0	0	0	0,6
Presença	0,7	0,6	0,7	0,6	0,1	0,3	0,6	0,8	xxxxxxx

PICTURE 9: Matrix SWOT

	Strategic objectives			
	OBJ1	OBJ2	OBJ3	OBJ4

Comp. char				
Strength				
FO1	0	0,7	0,7	0,7
FO2	0,6	0,1	0,1	0,8
FO3	0	0	0	0,6
FO4	0,7	0,1	0,7	0,6
FO5	0,8	0	0,5	0,9
FO6	0,6	0,6	0,1	0,7
FO7	0,6	0	0,6	0,6
FO8	1	0	0,6	0,7
FO9	0,8	0	0,1	0,9
FO10	0	0	0,6	0,9
FR1	0	0	0	0,6
FR2	0,7	0	0	0,6
FR3	1	1	0,8	0,6
FR4	0	0	0,6	0,7
FR5	0,8	0,8	0,6	0,6
FR6	0,8	0,8	0,6	0,8
FR7	0,8	0,6	0	0,8
FR8	0	0	0	0
FR9	0	0	0	0

PICTURE 10: Strategic objectives x characteristics of the Organization

	Envr Charac.							
Strat. objectives	OP1	OP2	OP3	OP4	AM1	AM2	AM3	AM4
OBJ1	0	0	0	0,8	0	0,6	0,6	0
OBJ2	0	0	0	0	0	0	0	0
OBJ3	0,8	0	0,8	0	0	0,7	0,6	0
OBJ4	0,8	0	0,8	0	0	0,85	0,8	0

PICTURE 11: Strategic objectives x characteristics of environment

	Strat. objectives			
	OBJ1	OBJ2	OBJ3	OBJ4
Strat. objectives				
OBJ1	1	0,4	0,6	1
OBJ2	0,4	1	0,7	0,6
OBJ3	0,6	0,7	1	1

OBJ4	1	0,6	1	1
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PICTURE 12: Strategic Objective x Strategic objectives

	Strat. objectives			
	OBJ1	OBJ2	OBJ3	OBJ4
Actions				
AC1	0,80	0,8	0,7	0,83
AC2	0,95	0,78	0,8	0,85
AC3	0,78	0,92	0,85	0,93
AC4	0,67	0,9	0,79	0,9

PICTURE 13: Strategic objectives x Actions

Processing the system fuzzy logic based in (Espin & Vanti, 2005), got then the following results for the definition of the Importance of strategic subjects to the construction of the BSC:

Description	
FO1 = Employees well paid	0,5359
FO2 = Subsidiary's company reputation	0,6441
FO3 = More than two decades in the market	0,5700
FO4 = Service specialization	0,5370

FO5 = Home service	0,4228
FO6 = Serving	0,5940
FO7 = Personalized services	0,5991
FO8 = Price and payment terms	0,7012
FO9 = Tourist station in large customers	0,5723
FO10 = Agent's service on international trips	0,5244
FR1 = Low professionals with experience on tourist administrative sector	0,2051
FR2 = Lack of information on internal procedures	0,3089
FR3 = Financial dept concentrated on the matrix	0,4403
FR4 = Excess of bureaucracy	0,4700
FR5 = Tasks accumulation	0,3054
FR6 = Demand higher than serving capacity	0,5715
FR7 = Lateness on invoice's delivery	0,1932
FR8 = Failure on accounting	0,0944
FR9 = Restriction regarding suppliers incentive do employees	0,1082
OP1 = Good use of Shortage on competitor's serving	1
OP2 = Inland alternative destiny's and ambient tourism	0,4381
OP3 = growth of Small and medium companies	0,6681
OP4 = Long term payments	0,3457
AM1 = Increase of publish on mass communication	0,1400

AM2 = Direct competition with large international companies	0,6632
AM3 = Bureaucracy adjustment to the customer needs	0,5300
AM4 = Sale's Limit to international trips	0,5111
OBJ1 = Modify the packages distribution by specialize agencies	0,5178
OBJ2 = Increase the products offer to small and medium business	0,4429
OBJ3 = Publish the long term payment thru a bank	0,5170
OBJ4 = Consider the real customers' need	0,5424
AC1 = Work in group for late tasks	0,6292
AC2 = Pending items resolution	0,6554
AC3 = Visit the customers	0,6602
AC4 = Cashflow	0,6631
AC5 = Daily meetings	0,6417

PICTURE 14: System for Definition of Strategic Subjects to the BSC results

Conclusions

As conclusions of the present work it is possible to visualize with prominence processing with higher degree of veracity is of opportunity 1 (OP1). The same was equal to one, or either, the main point to direct the forces is in function of the deficiency in the attendance of the competitors. The weakness number 1 (FR1) referring to few professionals with experience in the tourism administrative sector demonstrated not to be

important, therefore is fit in value of truth 0.2051 - sufficiently false category. The same occurs for the delay in the invoices delivery (FR7), Incentives restrictions of suppliers for employees (FR9) and Imperfection in the accounting system (FR8). The presented values of truth in Picture 5 define the Importance of the strategic subjects and prioritize the construction of the BSC.

The objective of the work was to define the importance of strategic subjects for the construction of Balanced Scorecard (BSC) in scientific way without losing the complexity of the context of the strategic management and with applied practical demonstration in a travel agency, branch of a Brazilian company. For this, an intelligent or complex system of information based on fuzzy logic was developed, due to the fact that the strategic management is a continuous process, interactive and cybernetic that wants to keep the organization as a set appropriately integrated to its environment.

The work contemplated the quantitative interaction, after-verbalization between the elements, not only of SWOT technique, but these related with the strategic objectives and actions, defined for the responsible groups of quarrel for the strategic planning and prioritizing the strategic subjects to be represented differentiation in the construction of Balanced Scorecard (BSC). With this, the tourist management could be converted into more feasible subject, thus better decisions could be accomplished by companies of this sector and consequently assist in the sustainable development with setting of communities in its regions of origin.

References

Andrade, J.V. (1992). *Turismo: Fundamentos e Dimensões*. São Paulo, Brazil: Editora Ática.

- Andrews, K.R. (1971). *The concept of corporate strategy*. Homewood, IL: Irwin.
- Beni, M. C. (2001). *Análise estrutural do turismo*. São Paulo, Brazil: Editora Senac.
- Bissoli, M. A. (2000). *Planejamento turístico municipal com suporte em sistemas de informação*. São Paulo, Brazil: Futura.
- Bonabeau, E. (2002). Predicting the unpredictable. *Harvard Business Review*, 80 (2), 109.
- Castells, M. (1999). *A sociedade em rede*. São Paulo: Paz e Terra.
- Chadwick, G. (1971). *A systems view of planning*. Oxford: Pergamon Press.
- De Masi, D. (1999). *O futuro do trabalho – Fadiga e Ócio na Sociedade Pós Industrial*. Brasília, Brazil: Editora UNB.
- Dror, Y. (1973). *The planning process: A Facet Design*. Oxford: Pergamon Press.
- Dubois, D. & Prade H. (1980). *Fuzzy Sets and Systems: Theory and Applications*. EUA: Academic Press Inc.
- Espin, R. & Vanti, A.A. (2005). Administración Lógica: Um estudio de caso en empresa de comercio exterior. *Revista BASE*, 1 (3), 4-22.
- Espin, R., Vanti, A.A. & Becker, J.L. (2005). Sistemas Inteligentes de Información para la planificación Estratégica: Un Estudio de Caso en Empresa de Comercio Internacional. *CLADEA*. Santiago do Chile, July.
- Friedmann, J. (1967). A Conceptual Model for the Analysis of Planning Behavior. *Administrative Science Quarterly*, 12 (2), 225-252.
- Gelas, B. H. & Milone, P. C. (2000). *Turismo: Teoria e Prática*. Brasília, Brazil: Editora Atlas.
- Ghewawat, P. & Rivkin, J.W. (2000). In Ghemawat, P. A., *Estratégia e o Cenário dos Negócios: Criando Vantagem Competitiva* (PP. 59-82). Porto Alegre, Brazil: Bookman.
- Giddens, A. (1991). *Structuration theory: Past, Present and Future*. London, England: Routledge.
- Goffman, E. (1979). *Relaciones en público*. Madrid, Spain: Alianza.
- Hall, M. & McArthur, S. (1998). *Integrated Heritage Management*. London: Statonay Office.
- Hall, M. (1992). *Urban and Regional Planning*. London: Belhaven.
- Hall, M. (2001). *Planejamento turístico*. São Paulo, Brazil: Campus.
- Kaplan, R.S. & Norton, D. P. (1997). *A Estratégia em Ação*. Brasília, Brazil: Editora Campus.
- Klir, G. J., Clair, U.H.S., & Yuan, B. (1997). *Fuzzy Set Theory: Foundations and Applications*. London: Prentice-Hall.
- Middleton, V.T.C. & Clarke, J. (2002). *Marketing de Turismo*. Rio de Janeiro: Editora Campus.
- Mintzberg, H. (1994). *The Rise and Fall of Strategic Planning*. USA: The Free Press (Division of Macmillan, Inc).
- Montejano, J. M. (1999). *Estructura del mercado turístico*. Madrid, Spain: Síntesis.
- Mukaidono, M. (2001). *Fuzzy Logic for Beginners*. Singapore: World Scientific.
- Oliveira, H.A. (1999). *Lógica Difusa: Aspectos Práticos e Aplicações*. Rio de Janeiro, Brazil: Interciência.
- Porter, M. E. (1990). *Competição: Estratégias Competitivas Essenciais*. Brasília, Brazil:

- Campus.
- Porter, M. E. (1986). *Estratégia Competitiva: Técnicas para Análise de Indústrias e da Concorrência*. Rio de Janeiro: Campus.
- Rose, A. (2002). *Turismo: Planejamento e Marketing*. Barueri: Manole.
- Shapiro, C. & Varian, H. (1999). *A Economia da Informação*. Rio de Janeiro, Brazil: Campus.
- Tapscott, D. & Caston, A. (1993). *Paradigm Shift: The New Promise of Information Technology*. New York, USA: MacGraw- Hill.
- Turban, E., Rainer, J.R., Rainer, K. & Potter R. E. (2005). *Administração da Tecnologia da Informação*. Rio de Janeiro, Brazil: Campus.
- Vanti, A.A., Espin, R., Goyer, D. & Schripsema, A. (2005). The importance of objectives and strategic lagging and leading indicators definition in the chain import and export process in the light of strategic planning through the use of Fuzzy Logic System. *ACM SIGMIS Conference Personnel Resource (CPR)*, Claremont. April.
- Vaz, G.N. (1999). *Marketing Turístico*. Sao Paulo, Brazil: Pioneira.
- Veal, A.J. (1992). *Research Methodos for leisure and tourism*. Harlow: Longman.
- Wright, P.L., Kroll, M. J. & Parnell, J. (2000). *Administração Estratégica: Conceitos*. São Paulo, Brazil: Atlas.