

Technology Strategies in Private Universities Based on Balanced Score Card

*Estrategias tecnológicas en universidades privadas basadas en **Balanced Score Card***

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ABSTRACT:

Universities need to have among its management and control tools, a system that allows them to measure and evaluate the results of the strategies applied in the exercise of its mission as an educational entity. The appropriate and effective usage of technological tools, increases the chances of achieving a higher academic, scientific, cultural quality and community outreach as well, to facilitate the process leading to competitiveness and leadership of a demanding market, where supply tends to exceed demand.

Keywords: BSC, Technological strategy, University

RESUMEN:

Las universidades deben tener entre sus herramientas de gestión y control, un sistema que les permita medir y evaluar los resultados de las estrategias aplicadas en el ejercicio de su misión como entidad educativa. El uso apropiado y efectivo de herramientas tecnológicas aumenta las posibilidades de lograr una mayor calidad académica, científica, cultural y de alcance comunitario, para facilitar el proceso que conduce a la competitividad y el liderazgo en un mercado exigente, donde la oferta tiende a exceder la demanda.

Palabras claves BSC, estrategia tecnológica, Universidad

1. Introduction

Although the application of methods and tools of management and control, both strategic and tactical, are well diffused at the enterprise level, in the case of academic management are rarely used by the institutions, not only higher education but different education levels prevailing in Colombia. In consequence, the diagnoses and outcomes in the current educational management show the urgent need for improvements in the various areas that make this

system up.

The role of strategic management in any organization, including the Higher Education Institutions (HEI), involves the formulation, implementation and monitoring of actions leading to the achievement of corporate goals. This process, known as "Strategic Planning" involves the definition of the mission and vision of the company, the strategic diagnosis, the setting of objectives, the means to achieve them and the design of indicators to facilitate the phases of monitoring and evaluation throughout the process.

Within this context is "The Technology Strategy", which is to assist in the process of strategic planning of higher education institutions as a fundamental element of it, given the importance of the introduction of technology and innovation in the development companies and their contribution to the generation of competitive advantages. In the case of higher education institutions, the scope of technology strategy goes to administrative and academic processes in three dimensions: teaching, research and extension.

In that order of ideas, the implementation of a practical tool that contributes in the stages of evaluation, measurement and control of each of the aspects of the strategy, it is important and indispensable to the process of academic and administrative management and strategic control. With this type of instrument, it is also easier to identify and capture relevant information from the environment related to the process of academic training, the regional context, the research and the different areas and regulations of the educational market. This to facilitate self-assessment processes, improvement plans of higher education institutions and external evaluation carried out by the Colombian State through its supervisory and control entities.

A modern methodology widely used by private companies and public organizations is the Balanced Scorecard (BSC), which has served as a model in the development of this study.

The purpose of the research is to analyze the Technological Strategy in the Higher Education Institutions (HEIs) of Valledupar, based on the Balanced Scorecard (BSC) model.

The foregoing includes the proposal of a Balanced Scorecard Model for Private Higher Education Institutions in which the Strategic Planning process integrated with the Technological Strategy is summarized, developed in the following phases:

Review of current technological strategies in relation to global strategies of higher education institutions.

Establishment of BSC perspectives in relation to the needs of higher education institutions.

Definition of measurable indicators and the determination of the corresponding causality relation of these.

Establishing roles of those responsible for indicators, objectives and perspectives.

Proposal and evaluation of strategic approaches to overcome or improve current situations that require it.

The research was conducted in the city of Valledupar and were included in the study the most representative private universities of the municipality: Santander University, Área Andina University, Antonio Nariño University, San Martín University and Santo Tomás University.

1.1. Background

The Balanced Scorecard (BSC) has applicability in any type of organization of a comprehensive, strategic and balanced manner, and involves a vision of the company from four perspectives: Financial Perspective or shareholders, Customer Perspective, Internal Processes Perspective, and Learning and Growth Perspective. The BSC model keeps related these horizons throughout the process of formulating and implementing strategy.

Recently it has also been included the user and community perspective, involving social variables in relation to communities, as is corporate social responsibility and care for the

environment. This concept was developed mainly to be used in the Public Sector by Bastidas and Feliu (2003). Researches in the field of higher education institutions based on the model of the Balanced Scorecard as the Palacio (2006), Chévez, Grimaldi and Acevedo (2007), Cifuentes and Perez (2010) conclude:

"The Balanced Scorecard helps effective planning, to understand and communicate the drawn strategy, and manage a global, long-term vision of the development plan of the institution, engaging all staff". "The BSC is an instrument that gives priority to the important matters, this being the key to the institution, and the aspect that should be taken into account to improve internal processes in order to obtain greater benefit and satisfaction of both the internal and external user". Meanwhile, research by the Chilean sociologist Jose Joaquin Brunner in 2005, realize the challenges that face today's institutions of higher education worldwide thanks to the effect of globalization. According to Brunner (2005), these challenges are:

Higher Education is an essential part of the system competitiveness countries. That is, competitiveness pillar system.

Higher Education should increase training opportunities, diversify its offer and platform providers, differentiate institutionally, be assessed externally, increasing its relevancy, expand and diversify its funding sources.

Likewise, higher education undergoes a series of transformations that can be grouped into seven major trends that have been identified by the same author:

Overcrowding systems, as a result of the growing range of access opportunities.

Horizontal and vertical differentiation of systems and institutions.

Quality assurance of services and products through procedures for public accountability of institutions.

Growing demands directed towards institutions and systems to raise the relevancy of the functions of knowledge.

Diversification and rationalization of sources of financing higher education.

Adoption of organizational cultures focused on innovation and entrepreneurship and, as a result of these trends:

The displacement of the center of gravity of the coordination mechanisms of higher education from the sphere of state and corporate power into the sphere of the market and competition.

As evidenced by these trends, global institutions of higher education are suffering great pressure, both from external and internal agents. The methodologies used for self-assessment processes in higher education institutions are made up of different quantitative, qualitative and thresholds variables that generates heterogeneity in the assessment and in the process of establishing indicators. There is not a generic tool to track and control its measurements, and there is no methodological clarity to process all the information generated by the higher education institutions.

In the case of the Republic of Colombia, these processes are regulated by the Ministry of National Education (n. d.) under Law 30 of 1992; through its assessment entities: The National Commission for Quality Assurance (CONACES) created by Law 1188 of 2008 and decree 1295 of 2010 by which the qualified registration, the offer and development of academic programs of higher education are regulated. The other entity is the National Accreditation Council (CNA), created by Act 30 of 1992 by which the public service of higher education organizes when it comes to obtaining a High Quality Accreditation.

Given the need to comply with the conditions of quality required by regulatory and control authorities, aswell as being a highly competitive market, the development of current research based on the application of the Balanced Scorecard (BSC) involving the Diagnosis, the Design,

the Implementation, the Management and Control of Corporate Strategies, in convergence with the Technological Strategy.

1.2. Corporate Strategy

Strategy concept originated in the military field applied to the planning and conducting combat operations on a large scale, whose means and results were uncertain. In the business field, this concept is not so far from the foregoing: "it is nothing more than a combination of means or methods to be used to achieve the objectives -defeat the rival- in the middle of uncertainty" (Frances, 2006). For some authors, the objectives are part of the strategy, for others, the strategy refers only to the means used to achieve the objectives.

The "Strategic Planning" defines the strategic guidelines of an organization, which are translated into actions with resource allocation and finally condensed into documents called plans. The strategy should be flexible and adapt to new increasingly changing scenarios, it can also be designed on a planned manner or can arise suddenly facing a change of an unexpected situation.

A well-formulated strategy enables the organization to effectively conduct its efforts and efficiently manage resources to bring it to a privileged position, based on their internal capabilities (strengths and weaknesses), and being able to anticipate quickly to changes in the environment, movements market shares of its competitors (opportunities and threats).

According to Thompson, Jr. Arthur A., Strickland, A.J., Gamble, John (2008). "Any strategy must be disposed and prepared to be modified according to changes in the market, the advancement of technology, the recent actions of competitors, the changing needs and preferences of customers, the emerging opportunities in the market and the clear evidence that the strategy does not work well. Thus, the strategy of a company is always in process."

To date there have been many authors who have given their contributions to the issue of strategy and strategic planning. Between the decades of 1960s and 1990s there are some like Chandler (1962), for whom the strategy was to determine the long-term goals and the choice of actions and allocation of resources needed to achieve them.

There are also the contributions from Andrews (1971) and Ansoff (1965), the latter who is a classic in the topic; who focused on the binomial Product-Market. For him the essence of the strategy focused on the products to be manufactured for the markets who were to be allocated; these were purely financial and marketing decisions. At this stage, companies devoted time to determine market segments, distribution channels and required investments. Until then, the technologies were not very important. Other concepts of strategy were developed by the same time by authors such Drucker (1971), Hofer and Schendel (1978), Wack (1985), Steiner and Miner (1977), Hax and Majluf (1984), among others.

Also contributed to the construction of the strategic approach, models and tools of that time, such as the concepts of mission, vision; strategy by levels: corporate, business and functional; external and internal analysis and scenarios. Some of these matrixes were: The Ansoff matrix, developed in (1967); the BCG matrix (1970); the GE McKinsey matrix developed in the early 70's and the ADL matrix in the mid-70's, among others. All this has guided the companies' managers and strategists in their attempts to find the magic formula to define the perfect strategy and control mechanisms to manage it.

Other of the most commonly used tools for identification of four major variables, is the Matrix SWOT, Weihrich (1982). By means of confrontation of the opportunities, threats, weaknesses and strengths, allows the formulation of strategies of Offensive, Adaptive, Reactive and Defensive types.

- Offensive Strategies Type: Those that are confronting the opportunities with strengths. These seek to gain a competitive advantage through aggressive actions against rivals in order to take advantage of an opportunity before they can establish defensive actions. (Navas and Guerras,

1.996). According to Thompson and Strickland (1,994) competitive advantage is gained with the use of a creative offensive strategy, which cannot be counteracted by rivals.

- Type Adaptive Strategies: They are those that are confronting the weaknesses with the opportunities. These are intended to improve internal weaknesses, taking advantage of external opportunities. The organization to which the environment provides some opportunities, but cannot exploit them because of its weaknesses, can decide to invest resources to develop poor areas so it can seize the opportunity.

- Reactive Strategies: They are those that are confronting the threats with strengths. Usually managers proactively modify some aspect of their strategy as long as they appreciate which aspects work and which do not, and when new ideas to improve it appear. However, managers must always be willing to supplement or amend all proactive strategy elements with appropriate reactions to unexpected events. Sometimes the market and competitive conditions will have an unexpected twist that requires some kind of reaction or strategic fit. These adaptive strategic adjustments are reactive strategic elements.

- Defensive Strategies: Those that are confronting the threats and weaknesses. "The defensive strategy consists in lowering the probability of attack of challenging companies, or divert them to other less important areas of business and decrease their intensity." Porter (1,988). "The defensive strategy decreases the risk of an attack, weakens the impact of any attack that is present, and influences challengers to direct their efforts towards other rivals," Thompson and Strickland (1,994). The defensive strategy does not increase the competitive advantage of the company, but strengthens and preserves it through various forms of protection.

In the 1980s it also outstands Michael Porter who dabbled in the field of corporate strategy, with its model of the Five Forces acting on businesses, such as: negotiating power of customers, negotiating power of suppliers, the threat of new entrants, the threat of substitute products and rivalry among competitors. (Porter, How competitive forces shape strategy, 1979).

More recently, new paradigms have been developed such as the Strategic plan of Hamel and Prahalad (1989), Co-opetition of Brandenburger and Nalebuff (1996), Hypercompetition D'Aveni (2010), Blue Ocean Strategy of Kim and Mauborgne (2005), seeking to respond to the new challenges of the accelerated competition of globalized markets. With regard to computer-based models is the Business Process Reengineering developed by Hammer late last century, Hammer and Champy (1994), with new proposals for the companies' organization.

1.3. The Technology Strategy

In the beginning, the business strategy was inspired by the financial Affairs and marketing, regardless technological factors. Technology and Strategy acted separately. Today this has changed, and in a long-term business vision, technology should be considered a key aspect.

In 1965, Ansoff established concepts such as competitiveness profile, synergy, strengths, weaknesses, opportunities and threats. It also included business strategies such as:

- Being the first on the market based on a powerful I&D department
- Being a follower company with a rapid reaction capacity to imitate the leader.
- Being cost efficient achieving significant economies of scale.

Based on this context, in the seventies matrices growth-share market of the consulting firm Boston Consulting Group, industry attractiveness and competitive position of McKinsey, Artur de Little maturity of the industry sector-competitive position of the company, are based on the same fundamental principles and break down business activities in various businesses or significant products.

However, although all these matrices provide useful indicators suitable for each product or business strategies; none of them considered technology explicitly. In the early eighties, Michael Porter, highlights the importance of determining the competitive advantage of the company, and identifies technology as an essential ingredient of the overall strategy, which vary

depending on the generic strategy being developing, and can only focus as follows:

- Cost leadership, which requires a large production capacity to produce huge series efficiently.
- The differentiation, which involves creating unique products on the market, and
- Segmentation, or specialization in a specific group of buyers, whether in a segment of the product line or in a geographic market. In turn, this segmentation may be leading or differentiating product costs.

Porter adds that the planned I&D must be consonant with the general strategy. (Porter, *Competitive Strategy*, 1980)

A few years later Porter introduces the concept of the value chain and in his book *Competitive Advantage*, in 1985, despite focus its analysis on the business strategy in the value chain, introduced at the end of a series of steps to carry out the technology strategy, recognizing its importance in the development of the overall strategy of the company, as a source of competitive advantage. (Valls and Escorsa, 2003).

1.4. Technology as a strategic variable

It is from the eighties when technology began to gain importance within the business strategy and to be considered as a survival tool for companies, determining the quality and cost of their products or services; and it also constitutes a major source of competitive advantage to achieve large market share and high profitability in companies.

At that time studies highlighting the importance of technology as a business strategy, such as the work of Roberts, Kantrow (1980) and Arthur D. Little consulting firm (1981) begin to appear. Other important works and which constituted a starting point, were Edward Roberts of the Massachusetts Institute of Technology (MIT), who proposed the analysis and evaluation of the competitiveness of each enterprise technologies and introduces the concept Elasticity of Technological Demand, defined as the influence on the demand of a product of improvement in some of its elements: cost, consumption, durability, reliability.

The Technology Strategy is therefore the direct result of technological planning, is a strategic nodal point of technology management, aligned with corporate strategy and business of the company. More specifically it is the way a company deals with the development and use of technology, and becomes an essential ingredient of its overall competitive strategy (Porter, 2005: 133).

Nowadays these concepts have been fully accepted, to the extent considered technology as a variable main strategic that integrated into the overall strategy of the company, it constitutes a key success factor for achieving and maintaining sustainable competitive advantages and positions market leadership.

1.5. The Balanced Scorecard

Beyond simple control management was introduced in the mid-nineties by those who have been considered precursors of the "Organizational Cybernetics" Kaplan and Norton (1996), a novel model that allowed further systematization of the strategic control, which it has been accepted widely. This is the Balanced Score Card (BSC), which constitutes a powerful and effective tool in identifying, analyzing, implementing and monitoring a system of variables that define and guide the corporate strategy of a company from the mission and vision of it, expressed in strategic maps, whose corporate objectives are translated into indicators that can be measured and controlled.

The balanced scorecard (BSC), involves a vision of the company from four perspectives: Financial Perspective or Shareholders, Customers Perspective, Internal Processes and Learning and Growth Perspective. User and Community Perspective, introduced by Bastidas and Feliu (2003) is mainly considered for implementation in the Public Sector.

The authors Montoya, Castaño and Lanzas (2005), in their article entitled "Balanced Scorecard in Higher Education Institutions" present a proposal on how to implement the BSC in Higher Education Institutions expressed in a model in which raises four perspectives: society, customers, processes, and training and growth. If an improvement is achieved in the formation and growth of the university community, you can get an adjustment in the internal processes (teaching, research and extension) of the institution, allowing effectively address applicants, students, graduates and employers, and provide well society better development opportunities. In this model, the financial perspective is replaced by a "social approach" but is expressed as in the original model, in the fact that if you have a good training and development, organizations can improve their processes, allowing a better customer service, which could generate greater profitability for the company. With the above, the interrelation of the four perspectives reflected: training and development, internal, customer and financial processes:

In adaptation to the previous model proposed, this study adopted Perspective Society, replacing the Financial variable, taking into account the impact of the academy in the socioeconomic development of the communities in which it exercises influence. Similarly, their contribution to business development and its link with the productive sector is so important, that the control entities include the variant "Relationship with the External Sector" in the assessment process conditions quality of HEI's. Likewise, the elements to be considered in this perspective are: community, public and private companies.

1.6. The Strategy Perspectives:

Following the four perspectives define BSC defined by Frances, A. (2006), in which the objectives that lead to strategies are located:

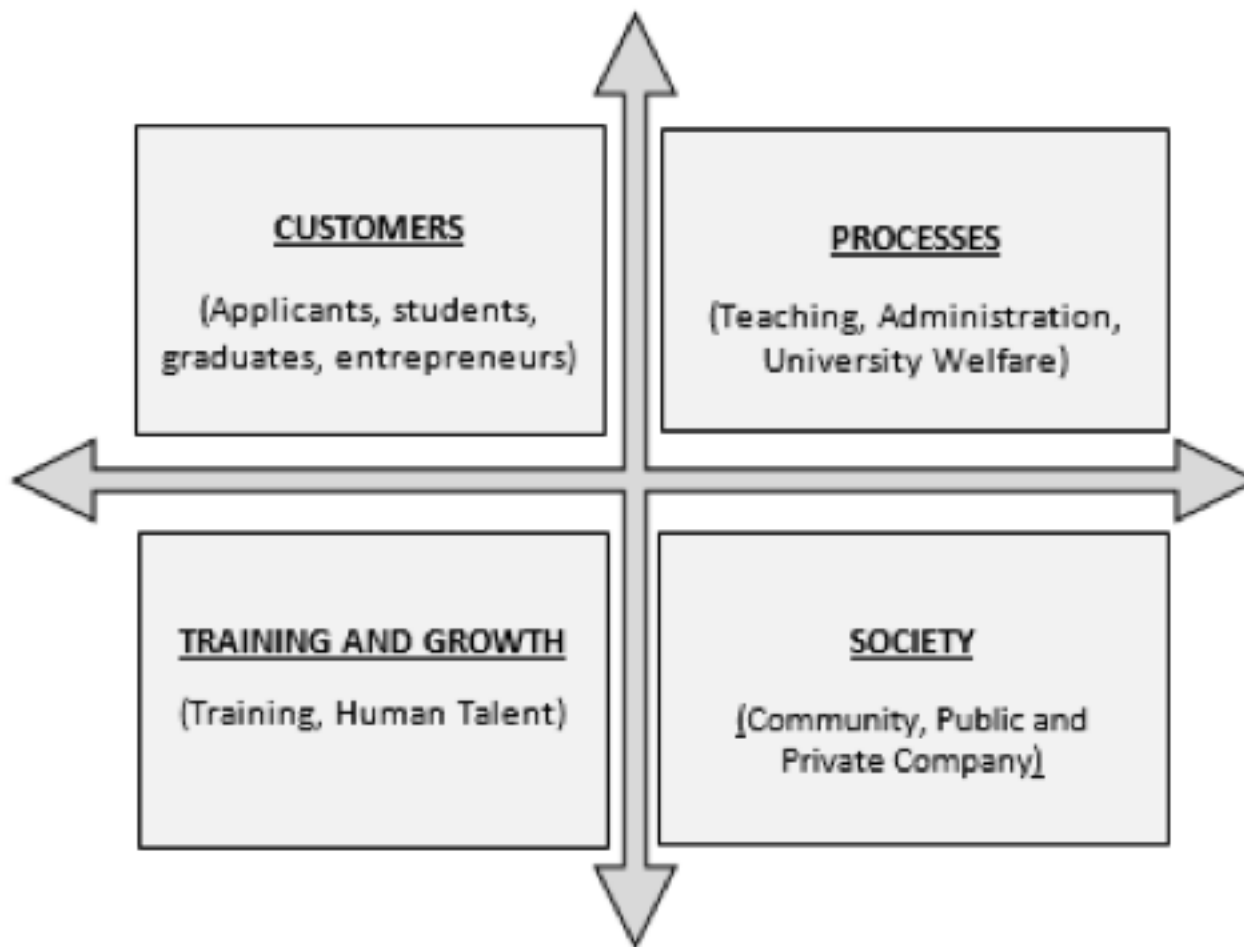
- The Perspective of Shareholders or Financial: represents the point of view of those who exercise rights of ownership over the company. Ex .: shareholder in a company, the sponsors on some non-governmental organizations, voters in an elected government.
- Customer Perspective or Market: represents the point of view of the recipients of goods and services. Government regulators with decision-making on products and services are located around this perspective.
- Process Perspective: represents the point of view necessary to produce the goods and services activities. It corresponds to the activities of the organization and other organizations that contribute to it, as outsourcers and suppliers. Regulatory processes are located around this perspective.
- The Learning and Growth Perspective: represents the point of view of the capabilities required for productive activities. These capabilities are of three types: human capital, organizational capital and information capital.

1.7. The model of the BSC in Higher Education Institutions

The BSC model has found wide application in companies of different nature or social, such as government agencies and non-profit object. For these are not always valid the four perspectives; in each case the perspectives that are most appropriate to represent the major stakeholders of the organization are chosen.

For the specific case of this study focused on the HEI's, and as mentioned previously, the implementation of the BSC model has proposed the following scheme Montoya, Castaño and Lanzas (2005), in which the financial perspective is ignored and "Society Perspective" is adapted, comprising those who receive direct or indirect impact of the activity of the organization: neighbors, communities, private or public companies and the environment.

The Society Perspective: it represents the point of view of the relationship with the external sectors, such as: community, public company, private enterprise and activities that derived from this link, benefit the society.



Source: Adaptation (Montoya Castaño y Lanzas, 2005)

1.8. Operationalization of the BSC Model

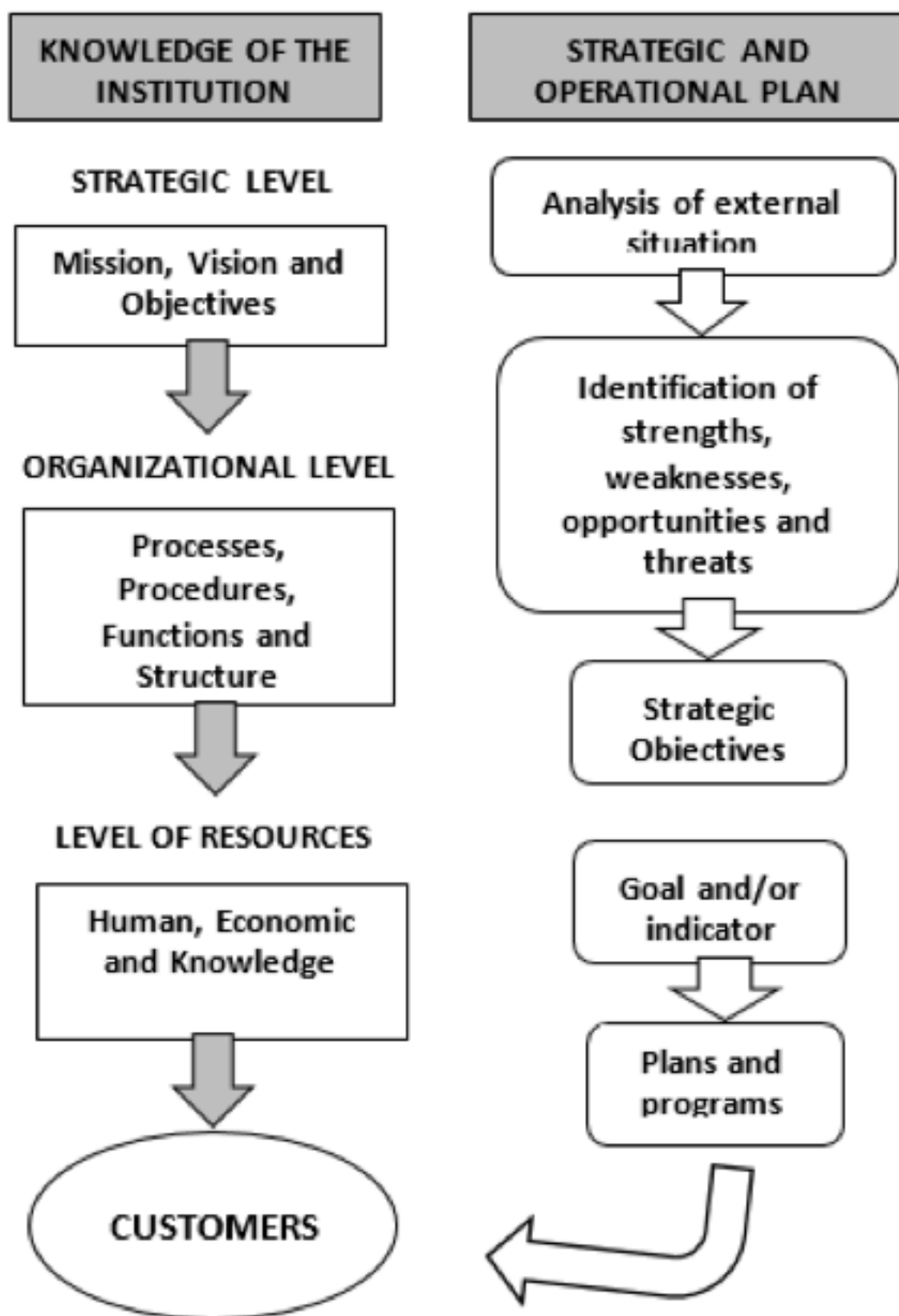
To implement the Balanced Scorecard in an Institution of Higher Education, it is proposed a scheme in which is defined an analysis model for the institution Montoya, Castaño and Lanzas (2005), as to include in its three dimensions. The proposed model breaks down the organization at three levels: strategic, organizational and of resources.

- Strategic level: Allows to know the purpose of the organization: mission, vision and goals to contrast with its internal needs and those of their clients.
- Organizational level: Determines how the mission is specified in some processes, procedures, functions and structures so it allows its compliance.
- Resource level: Once identified earlier levels, the human, economic and knowledge resources should be analyzed, and how the customer is focused.

The following figure shows the outline of the three hierarchical levels of the organization associated to each of the components of the strategic and operational plan, all with customer orientation.

Figure 2

Conceptual levels of the organization, strategic and operational plan.



Source: (Montoya Castaño y Lanzas, 2005).

2. Methodology

The type of methodology used in research was descriptive with non-experimental transeccional design. The population consisted of twelve (12) key informants that are part of the essential processes of private universities investigated, such as: the Academy, Research, Extension and the Communication and Information Technologies. The technique selected data collection was the survey conducted by applying a Likert questionnaire to the twelve key informants, which was carefully drafted, including the issues and facts relevant to the investigation, which are the object of the study.

3. Results

The study was based on analysis of the variable technology strategy in the private higher education institutions of the city of Valledupar. Interpretation and discussion of results was performed by dimensions and indicators in contrast to the theories proposed by different

authors.

In relation to the first dimension Types of Technology Strategies, each of the indicators was analyzed: Offensive Strategy, Defensive Strategy, Strategy Reactive and adaptive strategy.

In the first instance, it is the defensive strategy; according to the author Christopher Freeman (1974), a type defensive strategy involves the fact of not wanting to take the great risk of being the first to innovate but does not want to be left behind. Hopes to take advantage of the mistakes of others and improve their designs. In terms of Valledupar Private HEI you can highlight these practices, because generally they are not pioneers in the market, compared to other parts of the country, but are not far behind.

In second place, the reactive strategy appears; according to Urban and Hauser (1980), reactive strategies: responding to market demands and the activities of competitors. These can be sensitive to customers, imitative of new products, followed by the leader but improving their products, or defensive, improving the products of competitors. These responses are very consistent with reality, as the case of the HEIS a conjugation reactive- defensive strategies is given.

As for the second dimension, measurement and control systems, we sought to identify systems or models of Measurement and Control using the HEI's in their management through surveys to staff working in them. Per surveys conducted with staff of higher education institutions in this dimension, it is found in first place the Matrix of Technological Attractiveness, followed by the Matrix of Technological Position and finally the Value Chain Analysis, with a neutral level of activity as the most used in measuring and control systems of strategic variables. These instruments may be useful in the process of reflection and analysis for making decisions.

According to Escorsa and Valls (2003), the Technological Attractiveness-Technological Position Matrix, developed from the Matrix Mc. Kinsey, allows to perform a reflection on technology representative variables external to the company, which are not controllable such as the potential for the generation of new products, market growth, cost reduction, quality improvement, among others; versus the domain or competitive position achieved by the company.

Next, is the Tecnological Position Matrix, which according to Escorsa and Vall (2003), involves the classification of technologies to further determine the technological position of the company as defined by the mastery of key technologies and emerging. The technological position can be: strong, medium or weak and is related in turn to the competitive position, allowing deduct six strategies: technological leadership, follower, acquisition of technology, technological niche, joint venture and conversion.

Finally, according Escorsa and Valls (2003) the Value Chain Analysis of Michael Porter, analyzes the various activities of the company as design, marketing, technology development, among others, to discover where and how you can gain competitive advantage. Porter acknowledges that technology is present in all links of the value chain and plays an important role in determining the competitive advantage.

In relation to other measurement and control systems evaluated, is the SWOT matrix and Ansoff matrix (1965) or product market or vector of growth, both with a neutral level of development of the activity. Also the the matrix Growth-Participation or BCG for a very low level of activity is found; and finally the Balanced Scorecard proposed by Kaplan and Norton in 1996 at a very low level of development of the activity, showing that it is little used as a tool for measurement and control by the HEI's, due to lack of knowledge and familiarity with this powerful tool, which has been recently introduced.

Regarding the third and final dimension, key performance factors, the prospect society had the greatest weight. Next is the learning and growth perspective and then the processes perspective. Per Kaplan and Norton (1996) perspectives containing the Balanced Scorecard (BSC) model emphasizes the conversion of vision and strategy of the company strategic objectives and indicators. For them, these four perspectives provide the company with

mechanisms to create future value through investment in customers, suppliers, employees, processes, technology and innovation.

3.1. Proposal based on the BSC for Higher Education Institutions

3.1.1. The Strategic and Technological Plan

Retaking the model (Montoya Castaño and Lanzas, 2005), it is proposed that for the construction of a model of BSC for HEI's , should:

a) Having a knowledge of the institution at levels:

Strategic: mission, vision, goals

Organizational: processes, procedures, functions and structure

Resource: human, economic, knowledge

b) Having a strategic and operational plan, which is strategic planning that includes:

Analysis of the external situation

Identification of the strengths, weaknesses, opportunities and threats (SWOT).

Define the strategic objectives

Set Goals / Indicators

Design plans and programs to meet these objectives.

Now this proposed model (Montoya Castaño and Lanzas, 2005), should be aligned with the Technology Strategy:

c) Have a Technology Strategy Corporate Strategy aligned, which includes the following phases:

Perform inventory and assessment of technological competitiveness of the company; this process it is also called technology Audit.

Perform a diagnosis of the current state of technology supported on some of the following tools: SWOT, Porter's Five Forces and Value Chain Model, Matrix Product - Process, Technological Position Matrix and Technological Attractiveness Matrix.

Strategy Development:

- Strategy definition: offensive, defensive, adaptive, imitative, reactive. (Leader, follower..)
- Technological Objectives aligned with Corporate Strategy
- Goal, measuring and monitoring indicators
- Technological Plan:

Increase of Technological Heritage: Alliances, acquisitions.

Research and Development: Project Management R & D.

Technological surveillance.

Protection of Technological Heritage.

Once the internal context of the institution has been reviewed in its three levels: strategic, organizational and resources, and the technological audit has been carried out, a SWOT diagnosis must be run both at a corporate and technological level, which can be supported by other tools, such as the product-process matrices and the technology-attractive technological position matrix; It is also important to consider Porter's Value Chain and the model of the five forces.

Finally, once the strategy is defined, strategic objectives and the key performance factors are established. This plan should be led by senior management and effective communication systems must be guaranteed throughout the organization so that it is known and assimilated by

each of the people who are part of it, so that all execute with commitment actions aimed the fulfillment of the objectives set.

3.1.2. Preparation of the Strategic Map

Defined strategies and Key Performance Factors, developing the strategic map is proposed. For which also the perspectives that will focus the plan must defined. In this case, HEIs have defined four perspectives, such as: Customers, Processes, Society and Education and Growth.

It is noted that to each of these factors, an indicator to observe the evolution and impact on strategic management to implement must be formulated. Also, assign a target to each indicator to measure the achievement of the objective, which involves the development of activities that contribute to meeting them. The success of the model proposed by (Kaplan and Norton, 1996) lies in the quantity and quality of the indicators and their interrelation.

3.1.3. Balanced Scorecard Control

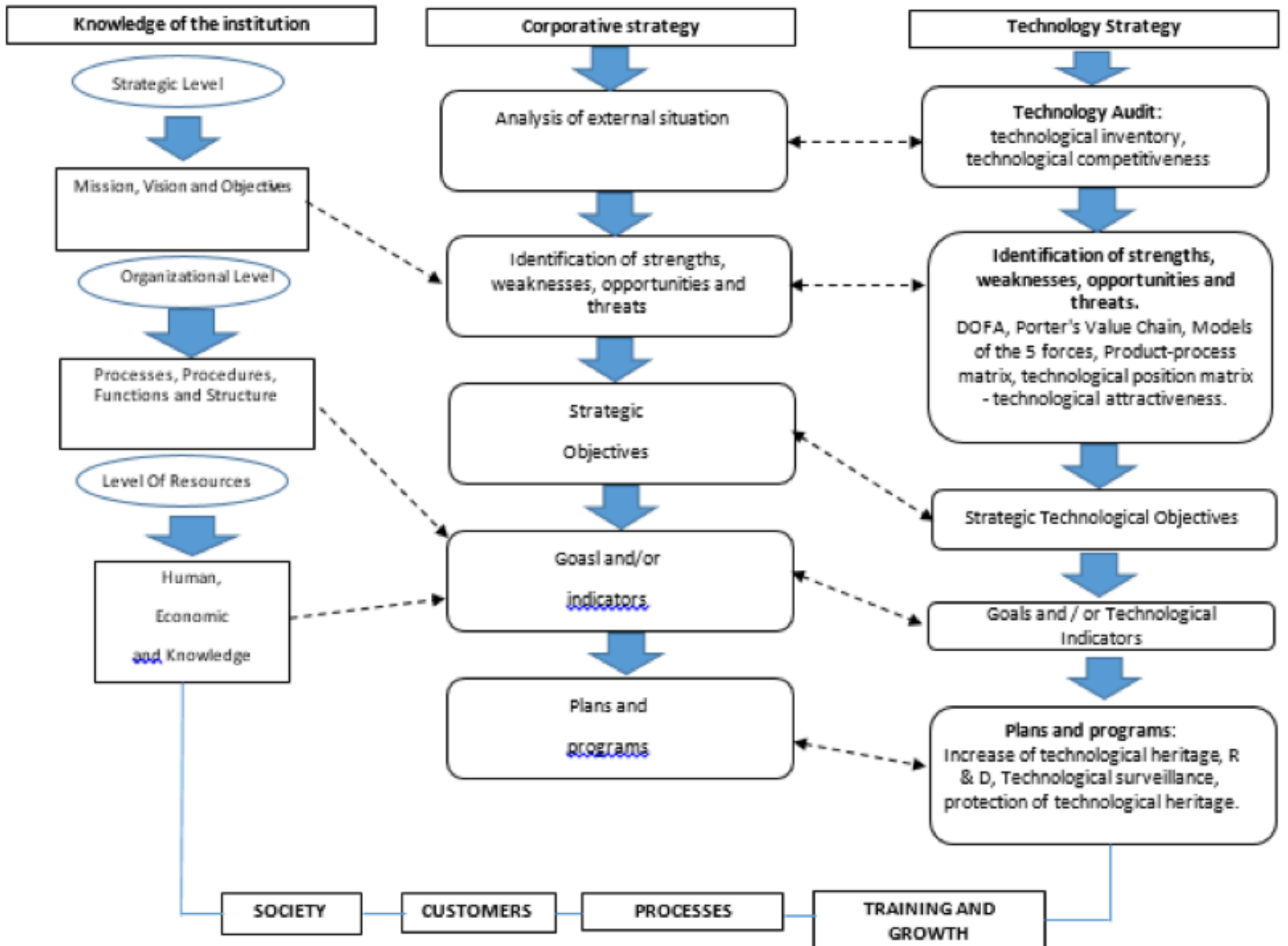
To monitor the BSC programs or applications can used, or just have a spreadsheet which relate each of the indicators.

To ensure the success of the system is relevant to implement an incentive system linked to targets associated with the indicator.

The following figures illustrate the strategic alignment model and technology plan and the strategic technological map of the Private Higher Education Institutions, drawn from the results and conclusions of the investigation.

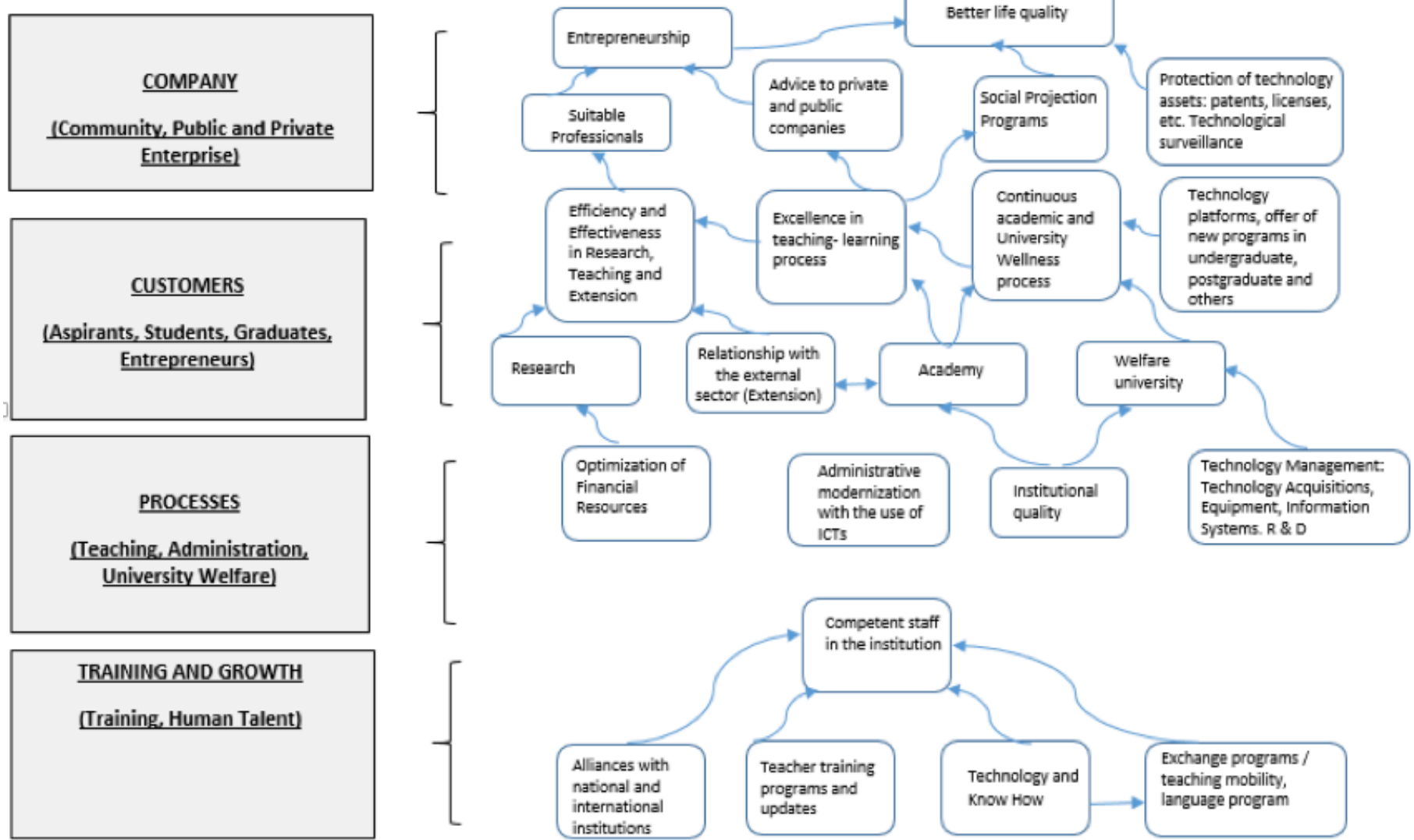
Figure 3

Alignment of the Strategic and Technological Plan



Source: Reseacher (2017). Adapted from Montoya Castaño y Lanzas (2005).

Figure 4
Strategic-technological map of Higher Education Institutions



Source: Reseacher (2017). Adapted from Montoya Castaño y Lanzas (2005).

4. Conclusions

It was determined that among Offensive, Defensive, Reactive and Adaptive strategies, the most predominant strategy is Defensive, followed by Reactive. This indicates that there is no aggressive position of leadership in the market, if not instead they act as followers, reacting to any eventual movement of the competition; Are not very innovative and their technological strategy is not based on R & D.

It was determined that the Technological Attractiveness Matrix-Technological Position (GE-McKinsey) and the Technological Position Matrix (Arthur D. Little or ADL), are the most used, in contrast to the Balanced Scorecard, whose utility is the least known and the least implemented tool.

With regard to the characterization of Key Performance Factors, according to the perspectives of the BSC for HEIs, those related to Prospects, Processes, Clients, Society, Training and Growth were defined, obtaining as a result, those that have to do with the perspective Society and Training and Growth are the most relevant for the population under study, meaning that the training of human resources of HEIs has much to do with the quality of product (graduates) that is being delivered to society. Client and Process factors are very close, both of significant importance, since they are the processes, which must be improved through the implementation of technologies, so that they become added values in front of the Client. These key performance factors must be highly interrelated with each other in order to achieve the synergies that achieve the objectives set.

Finally, the research proposes a BSC model, through which key performance factors can be built, as applicable to each institution and according to its corporate strategy designed, which will consequently guide the technological strategy.

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