

Balanced Scorecard Applied to the Brazilian Public Sector in the Scope of Civil Construction

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Abstract-- The concepts of the *Balanced Scorecard* (BSC) go far beyond simple performance measurement tools, as they allow organizations to establish the strategy and the ways to achieve organizational goals. The BSC has been used with great success by private organizations. Notwithstanding, its use in the public sector is still below the demand of society for greater transparency in resource management and improvement in the delivery of public services. This article aims, through a case study, to analyze and present a BSC proposal, a strategic map and performance indicators in two Strategic Business Units (SBUs) of different Brazilian federal autarchies, whose core business is the same: realization and supervision of civil construction projects at Federal University of Rio de Janeiro (UFRJ) and Federal Fluminense University (UFF).

Index Term-- *Balanced Scorecard*; public sector; strategic maps, indicators, civil construction, basic design.

I. INTRODUCTION

Technology has always been important for organizations related to civil construction. The successful companies were always those which incorporated new technologies to the physical assets, thereby allowing for more efficient mass production, with standardized products.

Historically, companies had the financial indicators system. Accounting has been titled “language of business”. After World War II, the need for reports and performance measures of the business unit was generated by the trend of diversification, a practice much employed by diversified companies, such as General Electric, which became famous – or even notorious - for the hard reports and financial controls of Harold Geneen, at AT&T [9].

“However, the advent of the information age in the last decades of the XX century has rendered obsolete many of the fundamental premises of industrial competition. Companies can no longer obtain sustainable competitive advantages only with the rapid allocation of new technologies to physical assets and with the excellence of the effective management of financial assets and liabilities” [9].

In competitive environments, the financial measures were the basic indicators of occurrences (lagging indicators), which were unable to capture much of the value created or lost by the actions of the executives in the last accounting period. Until the end of the XX century, the financial measures used to count part of, but not all, the history of past actions and did not provide adequate guidance on the actions that should be taken to create financial value in the future [9].

The organizational structure of the companies has changed dramatically over the second half of the XX century, becoming a competitive strategy to create new indicators that would enable a competitive advantage to keep every

organization in the market. Thus, new management tools that led to business success arose, such as the corporate *Balanced Scorecard* and strategic guidelines defining the mission, vision and organizational values. Large companies started to be segmented into distinct strategic business units, each applying its own BSC. These and other management tools have become essential to meet the business development and give support to the financial success of the companies.

Nonetheless, in the public sector, and in nonprofit organizations, the ultimate criterion of success is not the profit or the financial results, but rather a good performance in fulfilling the mission, meeting the needs and desires of the target customers: society.

In this work, it was developed an approach to the application of the BSC techniques into two organizational units (ORGUs), adapted into SBUs, each belonging to different public institutions of higher education. A more specific approach was considered, analyzing two SBUs operating in the civil construction segment, each meeting the needs of the academic community. The two institutions studied were the UFF, and the UFRJ.

The objective was to establish a relationship of efficiency through the analysis of the structures of both SBUs that may serve as a model for other public institutions of higher education in Brazil. This study aims to contribute to the implementation of the BSC focused on the ORGUs of the ETU (TOU - Technical Office of the University) of the UFRJ and on the SAEN (ENAS - Engineering and Architecture Superintendence) of the UFF.

II. THE *BALANCED SCORECARD*

Robert Kaplan and David Norton, targeting private sector institutions, propose the BSC as a structure model of strategic management that must be understood. Thus, it is suggested the implementation of a cyclical and virtuous process of analysis, diagnosis and strategic decision making, guided by a set of indicators that express financially the organizational performance, and important perspectives to the success and growth of the organization [2].

Therefore, the financial accounting model should incorporate the assessment of the intangible and intellectual assets of a company, such as quality products and services, motivated employees, efficient and consistent internal processes, and satisfied customers. [12]

The *Balanced Scorecard* is a complete tool, which translates the vision and strategy of the company to a coherent set of performance measures. Many companies have adopted mission statements to convey fundamental values and beliefs to all employees, pointing the essential beliefs and identifying target markets and core products [9].

The *Balanced Scorecard* retains financial indicators as the ultimate synthesis of the managerial and organizational performance, but incorporates a more general and integrated set of measures linking the performance from the perspective of customers, internal processes, employees and systems to the financial success in the long term by creating a structure, a language to communicate the mission and the strategy, and uses indicators to inform employees about the vectors of the current and future success [11].

In this sense, figure 1 shows a chain of cause and effect relationships, representing the connections between the four BSC perspectives: learning and growth, business processes, customer and financial.

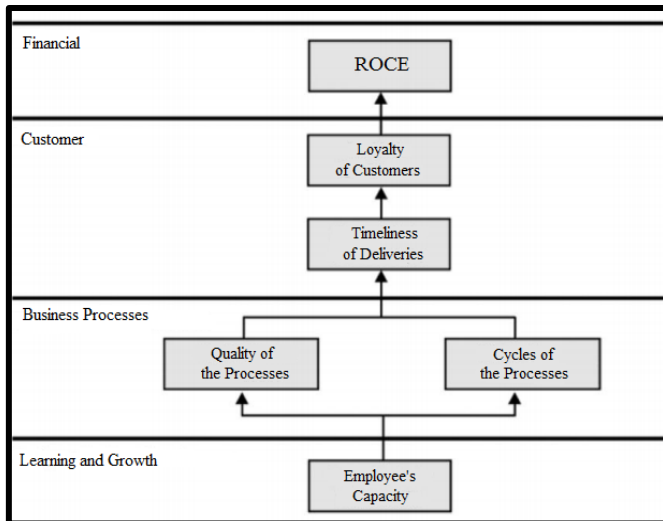


Fig. 1. Cause and effect relationships between the different perspectives [9]

Throughout the industrial age, in order to create value for shareholders, the return on capital employed (ROCE) was used to drive the internal capital, as well as to monitor the efficiency with which the physical and financial resources of companies were used [9].

The BSC should be used as a system of communication, information and learning, not as a mere control system [9].

Every measure selected for a *Balanced Scorecard* should be an element in the chain of cause and effect relationships, which conveys the meaning of the business unit's strategy to the organization [9]. That is:

“A good *Balanced Scorecard* should contain an appropriate combination of results (facts indicators) and performance drivers (indicators of trends) of the business unit's strategy” [9].

The history of the business unit's strategy is told by a well formulated *Balanced Scorecard*, identifying and making explicit the sequence of hypotheses on the cause and effect relationships between the outcome measures and the performance drivers of these results [9].

To achieve long-term goals, executives hope to channel the skills, energies and specific knowledge of employees in the entire company, by articulating the results desired by the organization with the vectors thereof [9].

An ideal SBU for the BSC runs activities throughout the value chain: innovation, operations, marketing, distribution, sales and service. The SBU must have its own products and

customers, marketing and distribution channels and production facilities, and especially a well-defined strategy [9].

As the BSC is a tool designed for private organizations, it is perfectly adaptable to the scenario of public, nonprofit organizations. In this case, the main perspective in the private sector, the financial perspective, becomes fiduciary and takes on a secondary role, as for the public sector the main focus is on customers.

A. The *Balanced Scorecard* in the public sector

For a public institution to fulfill the mission for which it was created, a Strategic Plan is necessary, representing the definition of a set of objectives, targets, indicators in time, prioritization criteria and initiatives to be taken in the medium and long term, raising into account the external environment and the internal conditions [1]. Hence, it is necessary to clarify and contextualize the BSC with respect to public sector organizations.

Kaplan and Norton [10, 11, 12] suggest that a nonprofit organization gives equal importance to the financial and customer perspectives, these being subordinate to the mission of the organization. Figure 2 shows this model of perspectives of the BSC.

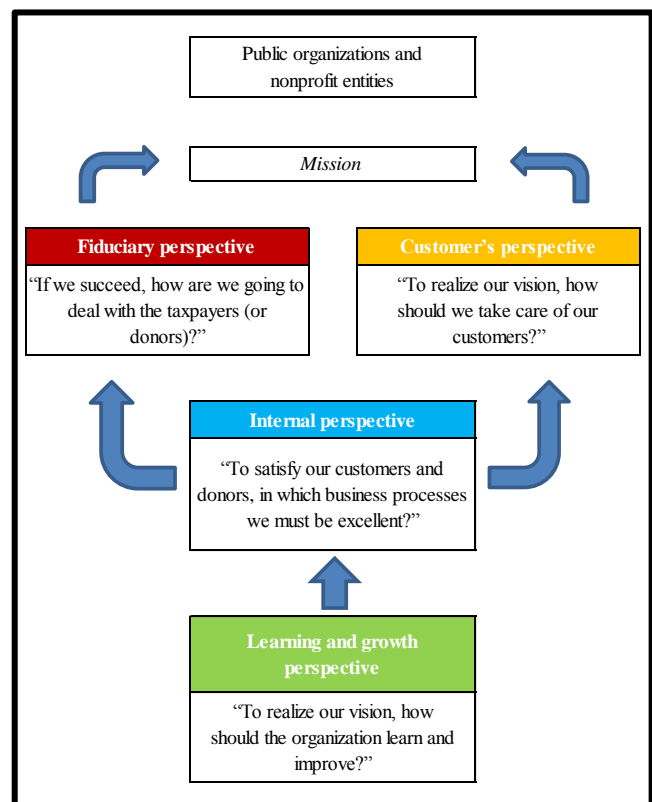


Fig. 2. Cause and effect relationship of public sector organizations and nonprofit entities [12]

There are also other kinds of approaches cited by Kaplan and Norton [12], as the case of the Municipal Council of the city of Charlotte, in which a BSC model was developed to deal with strategic issues of the city, where the customers' (citizens) perspective was placed on top of the BSC and the financial perspective has become the enabler of the citizens' perspective.

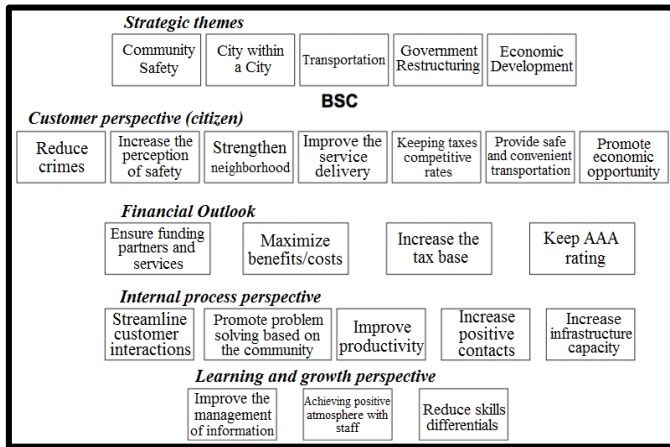


Fig. 3. Unfolding of the BSC model with the map of the city of Charlotte [11, 12]

It is noticed that the conceptual BSC model for government organizations should be different from the private organizations, with the financial perspective losing its top position, as can be seen in Figure 3, because what is at stake is the credibility of public institutions by meeting the expectations of citizens in relation to the public services promoted by these institutions.

B. The Balanced Scorecard in the Brazilian public sector

With the emergence of the Fiscal Responsibility Law (Law No. 101/2000), it was intensified the need for the use of management methodologies that not only enable the control of budget execution, but also encourage the estimation of revenues and expenses, aligned to strategic plans and purposes [15].

The actuation of those responsible for the management of others' resources, fully assuming the consequences of their acts and omissions, must obey the Principle of Accountability [1].

Through the art. 50, § 3 of the Complementary Law No. 101/2000, there is a need for management monitoring and evaluation, associated with the costs system. Likewise, the articles 48 and 49 of the same Law stimulate initiatives able to promote transparency both in the accountability and in the formulation of the budget forecast [5].

The article 2 of the Resolution No. 114/2010 [4] of the National Council of Justice (CNJ) provides that autarchies such as the lower courts prepare their plan of works of asset reform from a own program of needs and strategic planning. The priority indicator for each work shall be defined by the deployment of a technical evaluation system, based on the physical structure of the occupied property and including the scoring and weighting criteria grouped as follows:

- Of the roof and finishing of the work (floor, wall, roof, facade, miters, etc.);
- Of the installations of electricity, voice, data and congeners;
- Of the hydraulic installations;
- Of safety (railings, fence, alarm, fire fighting and prevention and congeners);
- Of the ergonomic, hygiene and health conditions;

- Of the potentiality of building problems (depending on the preservation and/or their age);
- Of the functionality (sectorization and articulation of spaces);
- Of the accessibility, location and interconnection with public transport means;
- Of other objective criteria deemed relevant.

Thus, one can infer that the strategic planning, regarding the work undertaken by public institutions, must be guided by parameters such as the setting of priorities and technical criteria. However, in practice, what happens sometimes are sudden changes in priority, not only impairing the planning as a whole, but also the basic engineering design.

It is not uncommon that several contracting authorities from different spheres of the government develop an incomplete document, called basic design. Sometimes the "basic design" boils down to the architectural design only; all other projects (details of architecture, structure, installations such as: electrical; hydrosanitary, air conditioning, fire, etc.) have the development task assigned to the winning bidders, impairing the original overall cost of the project. [13]

A complete basic design of engineering projects, as seen in Figure 4, must meet the overall planning of the project and its program of needs, having the necessary surveys (topography, geotechnique, insolation, rainfall) and the regulatory requirements (city hall, fire department, dealers of public services, institutes for preservation of historical heritage, etc.) [18].

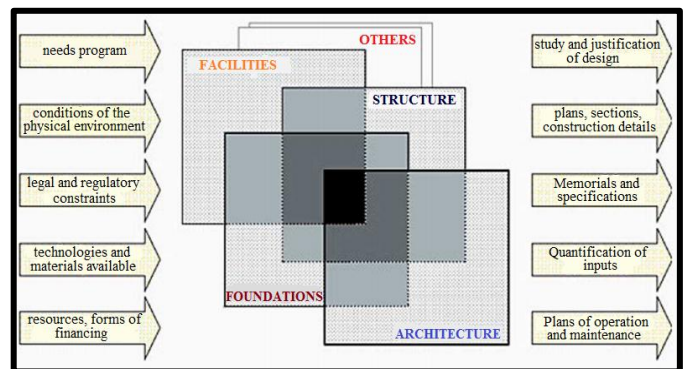


Fig. 4. Generation process of engineering projects: coordinated and simultaneous compliance [18]

Currently, in virtue of the Information Age and the speed with which it arises and spreads through the most varied and rapid means of communication, society has demanded of its representatives in governments increasingly transparent processes related to budget expenditures, as well as an improvement in the delivery of public services of all kinds: security, health, education, infrastructure, among others.

From such demands related to society, comes the motivation to evaluate the application of BSC in units of two distinct autarchies operating in the same segment of activity, which is the civil construction, in public institutions of higher education. The sectors concerned are the ETU-UFRJ and the SAEN-UFF.

It is noteworthy that the civil construction industry is the only one that needs to move to the location where the product will be run, differentiating itself from other types of industry

by presenting such a peculiarity. Therefore, deadlines, costs and quality need to be monitored not only by the interested entities, but by all stakeholders, so that high contractual amendments do not impede the progress of the project [1].

C. BSC implementation with emphasis on persons in a Brazilian public company

The BSC has been adapted to a SBU belonging to the Brazilian Agricultural Research Corporation - Embrapa, from a pilot project that gave rise to the Strategic Management Model (SMM), later extended to other SBUs of the organization, respecting their peculiar characteristics. Figure 5 describes the Corporative SMM, highlighting the strategic objectives common to the entire company. The Corporative SMM enabled the creation of the Strategic Action Plan (SAP) for each strategic objective and the results desired, aiming to reach the desired future state, having as guiding parameters the mission and vision of Embrapa [14].

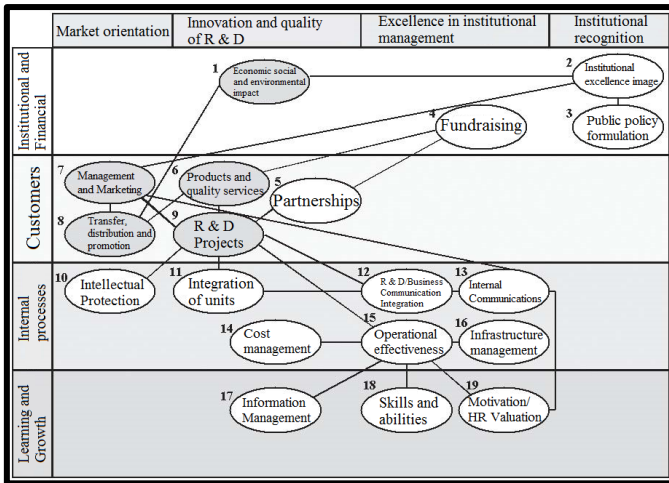


Fig. 5. Diagram of the Corporative SMM of Embrapa [14]

Despite the critical factors identified in the implementation of the SMM, such as Barriers: administrative/regulatory, making impossible to define priorities; issues related to inadequate levels of professionalism with regard to skills and abilities in people management; issues related to communication and learning; political and cultural issues, the following innovative factors were identified: new methodology for assessing the institutional performance considering the impact on society; integration of several employees from various SBUs, regardless of the hierarchical position occupied; use of performance indicators; horizontal organizational structure for decision making; greater communication, contributing to the reduction of cultural barriers among employees; development of three softwares to support the information management of the SMM project [14].

It notes that the use of information technology in the management of people is essential to the achievement of the results of the institution [12].

In contrast, few incentives to qualifying servers and non-existent or insufficient career plans leave the Brazilian public sector away from a learning and growth perspective.

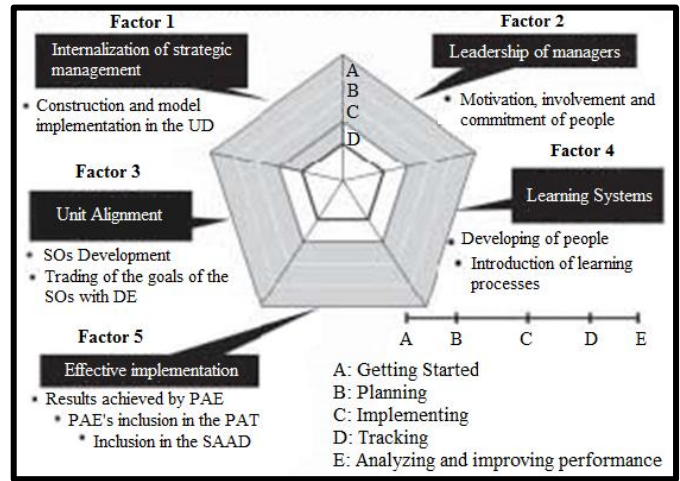


Fig. 6. Monitoring of the implementation of the SBU's SMM [14]

From the analysis of the diagram of figure 6, it appears that the factors 2, 3, 4 and 5 have greater difficulty of execution when compared to the factor 1. Thus, it can be inferred that the effective implementation of the BSC, in public sector organizations, requires large investment in mentality, culture and training of the employees, therefore it will impact on the prospects of the learning and growth and internal processes.

The obligation with respect to the hiring of civil servants far shall be only through public tender, it is a contributing factor for not adopting the BSC in the Brazilian public sector. As it shows the inflexibility of personnel management, not to mention that nowadays it is common to the development of policies for reduction of public administration spending, this being directly related to the public server.

III. METHODOLOGY

A case study was conducted in two sectors of different autarchies that perform the same type of service: ETU-UFRJ and SAEN-UFF. In this case study, several issues were identified, from the organizational structure of each of these sectors of the universities to the internal administrative procedures, passing through the complexity of already met or ongoing demands and cases of successes and failures.

The survey of all this information aimed to draw up a BSC proposal, including Strategic Map, performance indicators and their goals for both SBUs, taking into account the performance of the same activity in distinct autarchies. The data of highest frequency (year 2011) were adopted as a defining parameter of the targets of performance indicators, taken from the historical series of public works contracts supervised only by the ETU-UFRJ, in the period between the years 2009 and 2014, since it was not possible to access the data on the works inspected by SAEN-UFF.

IV. CASE STUDY

The Federal University of Rio de Janeiro (UFRJ) and the Federal Fluminense University (UFF) are federal autarchies linked to the Ministry of Education, the main purpose of each is to offer to the society a quality education at undergraduate and postgraduate courses.

The functional structure of both autarchies is quite similar: they are run by rectors elected by the academic community of each institution. In addition, there is the University Council,

also composed of representatives of the universities, such as teachers, administrative staff and students, elected by the academic community. These councils are the highest offices of these institutions and their decisions directly influence the academic community and the entire infrastructure of these autarchies.

Viewed as Strategic Business Units of these institutions, the Technical Office of the University, UFRJ, and the Engineering and Architecture Superintendence, UFF, are presented for this case study. Despite the difference between the names, these SBUs, which are linked directly to the offices of their rectors, have similar activities covering the development, planning, budgeting, implementation and monitoring of projects, services and works of engineering aimed at improving the physical infrastructure of the universities and meeting the demands of their respective academic communities.

Each SBU has its own functional structure, consisting of servers approved in public tenders, whose training and occupied positions are mainly architects, civil engineers, electrical engineers, mechanical engineers, designers, building technicians and administrative staff that support professionals in the performance of the activities. It is presented next, in figures 7 and 8, the org charts of ETU-UFRJ and SAEN-UFF:

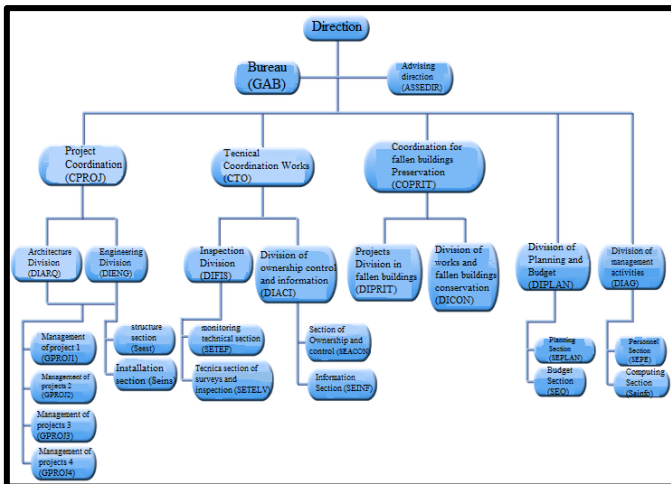


Fig. 7. Functional structure of ETU-UFRJ [6]

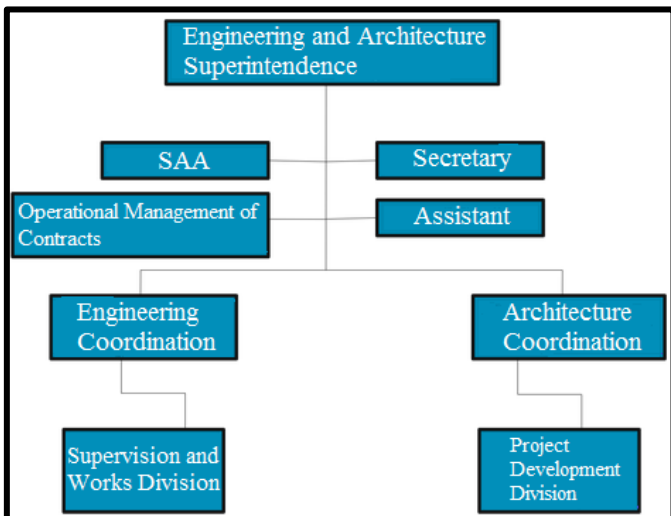


Fig. 8. Functional structure of SAEN-UFF [16]

In addition to the functional structure, these units feature professionals, cultures, administrative procedures, flow of internal processes, modes of operation, project development and project supervision methodologies and distinct works therebetween, each with its peculiarities. A macro view of the processes for both teams, showing the context in which they are inserted, is presented in figure 9, as follows:

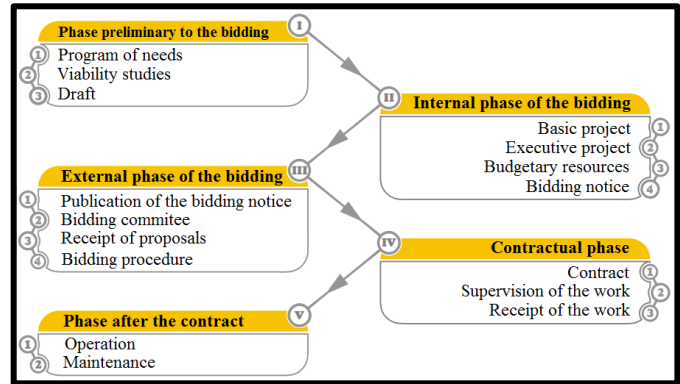


Fig. 9. Macro view of the processes common to both SBUs [3]

As shown in Figure 9, the servers of ETU-UFRJ and SAEN-UFF have an effective participation in the bidding process for public works of civil construction in the following phases: preliminary to bidding (draft); internal (basic and executive projects); and contractual (inspection and receipt of the work).

A. Mission, Vision and Values of ETU-UFRJ and SAEN-UFF

As part of the analysis proposed by this case study, it was surveyed and analyzed, for each SBU, the Mission, Vision and Values. This analysis aims to better understand the strategy, as well as the culture of both the ETU-UFRJ and the SAEN-UFF.

TABLE I
Comparison of the Mission, Vision and Values (ETU-UFRJ and SAEN-UFF) [7, 17]

	ETU-UFRJ	SAEN-UFF
MISSION	To be a support office at the UFRJ dean's office on issues related to the development, approval and management of Architecture and Engineering projects.	To think and execute innovative solutions within the scope of Architecture and Engineering, using resources optimally and sustainably, in order to plan and manage the development of the physical structure of the University.
VISION	To be a reference among the Federal Universities, as a model office in the development and management of Engineering and Architecture for public agencies.	To be a link of excellence, trained and qualified to design, monitor and manage activities related to Architecture and Engineering in order to meet the demands of the University.
VALUES	Acting ethically, using teamwork construction, committing to the user and his/her results.	Ethics, Transparency, Planning, Excellence and Sustainability.

When comparing the strategy described for the Mission, Vision and Values of each sector, in Table 1, it appears that the information present convergence, despite their different approaches to the development of activities. This convergence

is relevant in the elaboration of the proposal of a joint BSC, object of this case study.

B. Proposed Balanced Scorecard and Strategic Map

The BSC proposal presented below was drawn from the analysis of the best practices that each SBU features, as well as from the improvement of the weaknesses common to both, besides the very convergence with the strategies set out in the comparison between the Mission, Vision and Values of each unit. Thus, Figure 10, below, should be highlighted to the prospect of customers, which comes down to the academic community, located at the top of the hierarchy, and, not least, the learning and growth perspective serves as a foundation for the structure of the proposed BSC, as this perspective is directly linked to the work of public servers acting in ETU-UFRJ and UFF-SAEN, highlighting the importance of investing in their skills and in work infrastructure.

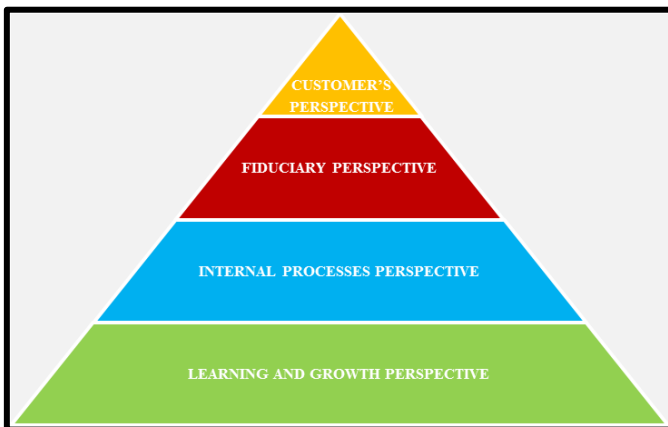


Fig. 10. Hierarchical pyramid of the BSC perspectives to public institutions.

Table 2, below, outlines the objectives for each of the four perspectives of the proposed BSC, confirming the importance of the relevant objectives for the learning and growth perspective, placed in the foundation of the pyramid, respecting the hierarchy, as shown in Figure 10.

TABLE II
BSC proposal for the SBUs

Customer's Perspective	Academic Community Satisfaction		
Fiduciary Perspective	Efficient Management of the Risk of Waste of Resources	Meeting of Deadlines	
Internal Processes Perspective	Interaction in the Bidding Procedure	Effective Performance	Optimizing the Use of Public Resources
Learning and Growth Perspective	Update of Knowledge	Teamwork	Greater Organizational Flexibility

For the preparation of the strategic map proposal, it was assumed that success, for public sector and nonprofit organizations, is the fulfillment of the mission. Figure 11, below, highlights the objectives and their connections, following a cause and effect relationship for each of the four perspectives of the proposed BSC, confirming once again that one of the keys to the achievement of the academic community satisfaction, and later to the fulfillment of the

mission, is to reach the objectives proposed for the learning and growth perspective.

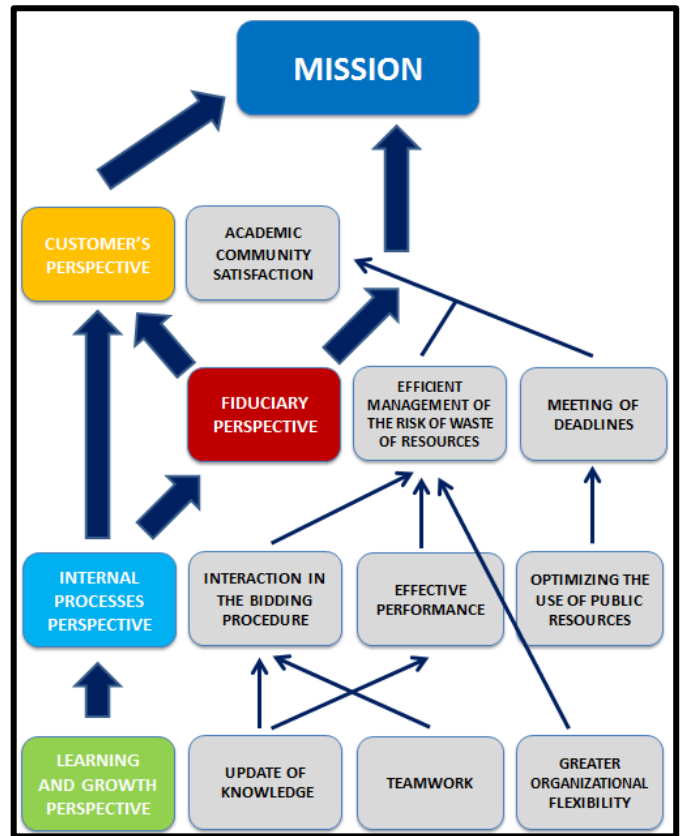


Fig. 11. Strategic Map proposal (SAEN-UFF and ETU-UFRJ)

C. Performance indicators

The year 2011 data (Figure 12) correspond to the highest frequency, and thus are the most important, for representing the largest number of contracts signed.

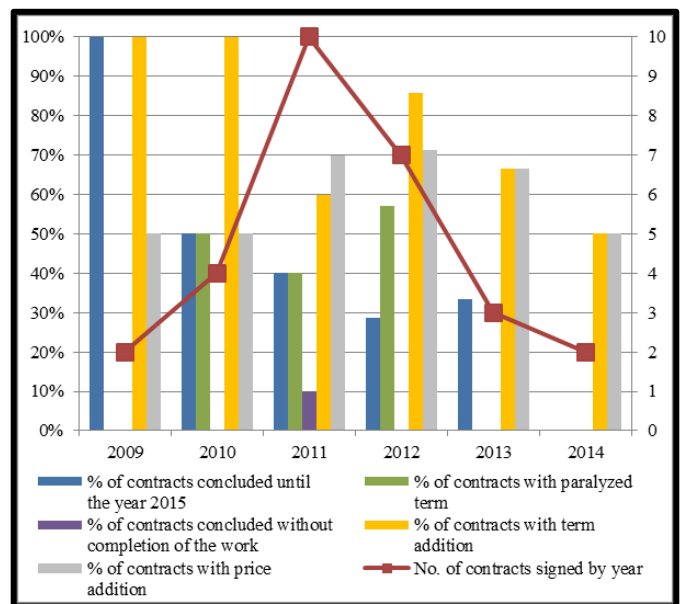


Fig. 12. Historical series with data of works monitored by ETU-UFRJ [8]

A favorable situation was the parameter of definition of the goal, which is contrary to the data in the graph

(unfavorable) for the following purposes: number of works completed with final acceptance; number of works without price addition; number of works completed within the time originally agreed.

Table 3, below, describes, from the main objectives presented in Figure 11, which are the performance indicators and their goals, authoritative in the data of Figure 12, as well as the initiatives that should contribute to achieving these goals.

TABLE III
Performance Indicators Proposal (ETU-UFRJ e SAEN-UFF)

Customer's Perspective			
Objectives	Indicators	Goals	Initiatives
Academic Community Satisfaction	No. of Projects/ Works that met the Expectations	Meeting 100% of the Needs and Expectations of the Academic Community	To perform ongoing dialogue with the Units during the Basic Project Preparation/Work Execution, and to establish priorities
Fiduciary Perspective			
Objectives	Indicators	Goals	Initiatives
Efficient Management of the Risk of Waste of Resources	No. of completed works (with Acceptance)	At least 90% of works, per Year , without extrapolating the percentage limits of Law No. 8.666 of 1993 for price additives	Proactive risk management, and development of more precise basic projects
	No. of Projects/ Works without price addition	At least 30% of Projects/Works, per Year , without price addition	Assessment of the Justifications Presented by the Hired Company, and development of more precise basic projects
Internal Processes Perspective			
Objectives	Indicators	Goals	Initiatives
Optimizing the Use of Public Resources	No. of Projects/Works completed within the stipulated deadline	At least 40% of Projects/Works, per Year , without term addition	Evaluation of the critical path of the project with the aid of a Software
Effective Performance	No. of Works Classified according to the Complexity	To Classify 100% of the Works According to the Level of Complexity	Evaluation considering location, deadline, type of work, square footage and purpose
Interaction in the Bidding Procedure	No. of Bidding Notices and their Revised Attachments	100% of the Bidding Notices and their Revised Attachments	Review performed by Servers Able to Compose the Supervisory Committee, aiming to detect possible errors
Learning and Growth Perspective			
Objectives	Indicators	Goals	Initiatives
Update of Knowledge	No. and Type of Training Courses per Server	100% of the servers doing the courses according to the planning of the managers	Program for subsidies, encouragement and dissemination of the courses available

The analysis of Table 3 in conjunction with Figure 11 shows an interconnection between the BSC perspectives for the SBUs of the present case study. The main perspective of the BSC to be met, for these entities, is the Customer, in this case the academic community. Notwithstanding, there is need to establish strategies that primarily meet the other perspectives, such as:

- To encourage professional training in the SBUs, either in new systems and computational tools, in the learning or in the improvement of procedures that address the areas of planning, supervision, bidding and projects, or in the constant changes in legislation and technical standards;
- With better trained servers, managers should perform, in conjunction with these professionals, the review of internal processes to ensure, among others, both for the works and the projects, the achievement of targets and deadlines, as well as greater efficiency and quality of services provided by the servers themselves or by third parties, which reduces, for example, delays in delivery or the need to rework;
- With better trained servers and internal processes reviewed and met, the fiduciary perspective can be easily met, since with quality services, carried out in accordance with the specifications and especially within the proposed deadlines and budgets, the management of public resources becomes more efficient, minimizing the need for contractual price and term additives from third parties, as well as the loss to the exchequer in carrying out projects under these academic units;
- In this way, with better prepared professionals, reviewed internal processes and more efficient management of public resources, the ETU and the SAEN can meet effectively the needs and desires of the entire academic community of UFRJ and UFF, respectively. It is noteworthy that such demands of the academic communities should be analyzed from the perspective of technical criteria, and not political; they should also be in line with all current legislation and the availability of public resources of both universities budgets. In addition, these SBUs should expand the communication with the academic community as a whole, avoiding wear with projects that meet only one of the parties.

V. CONCLUSION

The implementation of the BSC in the private sector is something already established, given the success of several organizations that have adopted this concept in developing their strategies. Nonetheless, the use of BSC in the public sector is still below the expectations of the Brazilian society that, as a customer, demands improvements in the service delivery and the efficient use of public resources.

Because of all legislation dealing with contracts and biddings in the public service, as well as the guidelines regarding budgets, processes, designs and supervision of works and even the very verticalized and immobilized functional structure of the public service, it is reasonable that

the implementation of the BSC for developing strategies becomes even more difficult and less accepted by servers.

The case study presented in this article allowed to evaluate some factors related to the efficiency of two SBUs from federal autharchies with the same business core, as well as to use the concepts of BSC, Strategic Map and Performance Indicators that allowed achieving the goals outlined in the Mission, Vision and Values of each of the organizations.

It is worth noting the difficulties in implementing the BSC in the public service, because of the need for profound changes, mainly cultural and political. However, it is verified that the same procedure proposed in this paper, applying the BSC, may be used by IFES - Federal Institutions of Higher Education that have different SBUs with similar goals.

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FOOTNOTES

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