World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:16, No:5, 2022

Managing an Acute Pain Unit Based on the Balanced Scorecard

Helena Costa Oliveira, Carmem Oliveira, Rita Moutinho

Open Science Index, Economics and Management Engineering Vol:16, No:5, 2022 publications.waset.org/10012549.pdf

Abstract**—**The Balanced Scorecard (BSC) is a continuous strategic monitoring model focused not only on financial issues but also on internal processes, patients/users, and learning and growth. Initially dedicated to business management, it currently serves organizations of other natures - such as hospitals. This paper presents a BSC designed for a Portuguese Acute Pain Unit (APU). This study is qualitative and based on the experience of collaborators at the APU. The management of APU is based on four perspectives – users, internal processes, learning and growth, and financial and legal. For each perspective, there were identified strategic objectives, critical factors, lead indicators and initiatives. The strategic map of the APU outlining sustained strategic relations among strategic objectives. This study contributes to the development of research in the health management area as it explores how organizational insufficiencies and inconsistencies in this particular case can be addressed, through the identification of critical factors, to clearly establish core outcomes and initiatives to set up.

Keywords**—**Acute pain unit, balanced scorecard, hospital management, organizational performance, Portugal.

I. Background

THE needs and circumstances of management in the hospital environment are very particular. The collection, processing and selection of information are always very important, but in hospitals, where information is dispersed under the most varied formats and with many competing relevant stakeholders, this is particularly difficult and susceptible. To better thrive in this ecosystem, hospital quality systems, centered in global and departmental indicators, were developed for public hospitals.

Health organizations in Portugal are very tight and rigid, averse to a change that seems inevitable; most employees do not understand the framework of their processes or the place and importance of their tasks in the good provision of health services to the population, feeling disconnected. There is a real need to explore new alternatives of management, such as the BSC, to address these hindrances.

The BSC, an organizational support tool that emerged in 1992 [1] aiming at organizations subject to the rules of the free market, can be adapted to hospital management. In Portugal, this adaptation is still incipient, with few studies on the subject. The BSC evolved from an organizational evaluation model that proposes evaluation criteria complementary to the usual financial perspective [1], into a strategic management tool. It refuses to center exclusively on financial issues blind to a long-term concern [2]. It also cares with data related to three other perspectives that inform about the organization's real capacity: customers/users, internal processes and the ability to learn and grow; not forgetting the financial perspective. All four perspectives must be considered interrelated, and this is a critical feature of the BSC. For each of them, strategic purposes and their critical success factors are identified; as are selected the parameters to be attended – lead indicators – related to the objectives pursued and their ways. When naming indicators, we choose measurement standards that allow an objective and verifiable evaluation. Processes and practices are also established to provide feedback routines related to the performances. Causal relationships between the indicators of each perspective are defined in a strategic map. Thus, the network of relationships is an assumption, not necessarily factual, we can say that it is a strategic hypothesis [3] about the consequences of internal and external actions on the organization's reasons for being. Through all this process, the BSC finishes proposing an overall view of the organization.

Initially implemented in business organizations, Baker and Pink considered the BSC tool and concepts relevant for hospitals [4]. The public health area consumes the most resources and has the most social repercussions, calling for management aware of what is at stake. An adapted BSC may better assess critical factors and lead organizations with a strategic plan, under a system design that provides, in a balanced way, information to taxpayers and users [5]. Hospitals have very dispersed information, in various non-integrated systems [6]. In an environment where indicators proliferate, the selection of the most important ones, those that enable the materialization of critical success factors, is essential. The BSC can be used as a platform to manage this information by streamlining complex changes [7], [8] while providing control of health practices [9]. The BSC promotes the integration of health care organizations, framing even the heterogenic day-to-day operations within a broader vision and core values [10]. This integration results in stronger leadership and potentiates its development.

The application of the BSC to non-profit organizations, as a hospital, emphasizes, not the financial perspective, but the perspective of customers/users. In health care organizations also, the perspective of learning and growth is crucial. Technological follow-up and research in the hospital field are a condition of survival. In an area where the qualification of employees is demanding, retaining the best is fundamental; so much that employee satisfaction and motivation are factors to be considered. The employees' experience, their knowledge, is critical intangible that the BSC will have to consider. Good

Helena Costa Oliveira is with Polytechnic of Porto, Portugal (e-mail: helena@iscap.ipp.pt).

clinical services demand teamwork, requiring the clarification of processes and outcome indicators - as encouraged by the BSC model.

The implementation of the BSC in hospitals may answer several needs. In a Danish hospital, the BSC was used to attain corporate strategic alignment goals with operational units in order to improve cost effectiveness [11]. In the Skåne Region, the BSC was used as a control system to sustain cooperation between a public purchaser and a private provider within health care [12]. The weak overall organizational performance of Kenyatta National Hospital motivated the adoption of the BSC and its perspectives, resulting in a better performance. The application of the BSC in two hospitals, one from China and another from Japan, proved capable of understanding the existing problems and identifying opportunities [13]. Therefore, the BSC can be used not only as a measurement tool but also as a strategic management tool in public facilities [14].

When applying the BSC to hospital management, it is important to consider how the public sector differs from the private. Boston et al. [15], one of the first proponents of New Public Management, alerted about many divergences to consider: the degree of exposure to the market's confidence in endowments; the legal and formal restrictions of courts, legislature, hierarchy; political influences; the amplitude of impact; public scrutiny; the complexity of objectives, evaluation and decision criteria; authority relationships and the role of managers; incentives and incentive structures; personal characteristics of employees; change in management and priorities following electoral cycles.

II. Method

This paper presents the design of the BSC in an APU active since September 2010 and aims to highlight the causal relationship among the several strategic objectives. The study is qualitative and is based on the experience of collaborators at the APU. The unit works with an Anesthesiologist or Intern within the Anesthesiology specialist, on duty every weekday. It performs pain assessment and treatment and side effects of analgesic therapy at 24, 48 and 72 hours in different surgical services: General Surgery, Urology, Vascular Surgery, Plastic Surgery, Neurosurgery, Cardio-Thorax Surgery, Orthopedics 1 and Otorhinolaryngology; and is included in the daily visit to the Intermediate Surgical Care ward (since April 2011).

This study is consequent to an APU's internal diagnosis that highlighted unattended problems and interests in its management: the need to comply with a binding norm of the General Directorate of Health – the existence of organizational guidelines; inefficiencies of the ongoing operating method - lack of a business plan, internal regulations, protocols, undefined priorities and goals; insufficiencies in internal communication; organizing and articulating training needs among the various professionals in the institution; difficulty in articulating with the other professionals and services. All the work was sustained in this prior diagnosis that encapsulates the unit working culture and its institutional context. This work resulted from the effort of the professionals of the unit with the guidance of an accounting expert.

In this paper, we seek to adopt the BSC to the APU putting forward an implementation hypothesis.

III. Results and Discussion

The work began to plainly state the vision (what the unit intends to be), the mission (the unit's reason for being) and the guiding values of the APU. This APU envisions to be a Unit of recognized excellence. This means to be capable of optimizing available resources, tangible and intangible, bolstering exemplary standards of technical-professional quality that provide confidence and satisfaction for patients and professionals. The mission is to promote adequate control of Acute Pain and the side effects of the therapy instituted for patients at the Hospital Center, in the hospital and emergency arrangements. The values are Accessibility, Responsibility, Knowledge, Quality and Humanity. Following these statements, and accordingly, the BSC work implied the definition of the main perspectives of analysis, its strategic objectives, respective critical factors, lead indicators and related initiatives. The chosen perspectives, selected to enable management to have an integral and articulated view on the functioning of the APU, were Users, Learning and growth, Internal processes, Financial and legal. Users' perspective regards at those to whom the services provided are directed. Internal processes are concerned with the organization of service provision. The learning and growth perspective attends at the ability to re-evaluate the services provided and continuously improve them. The financial and legal perspective relates to the budgetary of the APU and the regulatory requirements of the National Health Service.

Strategic objectives were the next fundamental decision, as they guide the management of APU in its options. Accordingly, were outlined the critical factors to attend, the respective lead indicators to measure and the initiatives related to the intended outcomes. We present a table articulating this information for each of the perspectives of analysis. From the Users perspective (Table I), the important is to ensure user satisfaction, so that the unit is valued and gains importance - it implies providing the appropriate treatments, at the proper time.

In the Internal Processes perspective (Table II), the concern is the efficiency of processes, which implies caring for the current organizational model and the creation of information systems and networks that enable credible records of audit processes.

In the perspective of Learning and Growth (Table III), considered essential to the continuity of this medical unit, attention is given to certified training, internal research and modernization of equipment and available therapies.

In the financial and legal perspective (Table IV), the hierarchical and political constraints are recognized, arising the need to produce own revenues to rationalize costs, while gaining political leverage.

Open Science Index, Economics and Management Engineering Vol:16, No:5, 2022 publications.waset.org/10012549.pdf

TABLE I
USERS PERSPECTIVE

Strategic Objectives	Critical Factors	Lead Indicators	Initiatives
•Timely access to analgesic treatment.	•Implement and make available analgesic and complication treatment protocols.	•Number of protocols per possible treatments.	•Implement and availability of analgesic and complication treatment protocols. •Creation of analgesic protocols for the pediatric population. •Creation of protocols for the treatment of differentiated analgesia complications.
•Therapeutic adjustment.	•Implement special analgesic techniques (Patient Controlled Analgesia). •User satisfaction.	•Quantity of consumables purchased. •Degree of satisfaction of users.	•Acquisition of consumables for patient-controlled analgesia systems - epidural, perfusion in peripheral blocks. •Introduction to Unit 1 and Unit 2 of celecoxib. •Preparation of user surveys.

TABLE II
INTERNAL PROCESSES PERSPECTIVE

Strategic Objectives	Critical Factors	Lead Indicators	Initiatives
•Improve organizational and functional model.	•Specify functioning goals. •Promote communication between different professionals in the service. •Create tools that encourage multidisciplinary and cooperation with other hospital services.	•Service response times. •Number of meetings. •Degree of cooperation. •Response time in the relationship between different services.	•Calculate average response times. •Semi-annual multidisciplinary meetings. •Assignment of a mobile phone allocated to the APU, facilitating a communication channel. •Inquiry. •Creation of performance and cooperation organizational chart. •Annual audit.
•Creation of information systems and networks that allow correct records and auditing processes.	•Promote articulation with the Information Technology (IT) service. •Adjust availability and improve the efficiency and quality of existing systems.	•Hours of monthly meetings with information technology services. •Record creation, information evaluation.	•Monthly meetings with the IT. •Service Identification of needs in information systems. •Code creation in the computer application "SONHO" base for APU. •Insertion of APU protocols in the electronic prescription of hospital admission. •Availability of protocols on the Intranet. •Creation of records in the Patient Surgery Management Software. •Assessment of information for internal control and auditing purposes. •Include in the Nursing Practice Support System: pain intensity assessment - dynamic and at rest; response to analgesic therapy; side effects of analgesic therapy.

TABLE III
LEARNING AND GROWTH PERSPECTIVE

Strategic Objectives	Critical Factors	Lead Indicators	Initiatives
•Promote adequate and certified training.	•Training for Anesthesiologists. •Training for doctors from other specialties. •Training for Nurses. •Training for Patients and their Caregivers.	•Number of training hours.	•Service Meeting Training. •Specific training on Patient Controlled Analgesia. •Disclosure of analgesic protocols, of action. •Pain training and conventional treatment. •Training on pain assessment and recording as the 5th vital sign, evaluation and recording of side effects of analgesic therapy, institution of rescue drugs according to protocols and medical prescription and medical activation when indicated. •Creating an information pamphlet. •Addendum to anesthetic consent to include special analgesic techniques.
•Implement research into Acute Pain.	•Develop clinical study protocols in patients with Acute Pain. •Establish interconnection with different professionals and their awareness of these projects.	•Number of protocol-related studies. •Number of contacts established.	•Prospective study of Acute Pain related to additional analgesic protocols.
•Unit Modernization.	•Updating technical equipment and introducing new therapies. •Professional satisfaction.	•New equipment and drugs. •Degree of satisfaction.	•Market research. •Satisfaction surveys of physicians, nurses, administrative.

TABLE IV
FINANCIAL AND LEGAL PERSPECTIVE

Strategic Objectives	Critical Factors	Lead Indicators	Initiatives
•Increase revenue.	•Create your own recipes. •Obtain research grants. •Sponsorships.	•Training actions. •Number of scholarship applications. •Value of financing by financing entity.	•Participation in international congresses. •Training actions to private entities. •Competition for research grants. •Association with research centers.
•Reduce costs.	•Increase service efficiency – time/patient costs.	•Cost per protocol.	•Sponsorship fundraising. •Calculate/evaluate costs.
•Influencing policy definition.	•Public disclosure of the activity	•Unit nomination in the media (public recognition).	•Increase public contacts. •Number of times the unit is named in the media.

Open Science Index, Economics and Management Engineering Vol:16, No:5, 2022 publications.waset.org/10012549.pdf

The relationship understood between perspectives and strategic objectives are illustrated in the strategic framework (Fig. 1), revealing how this management proposal works in the APU.

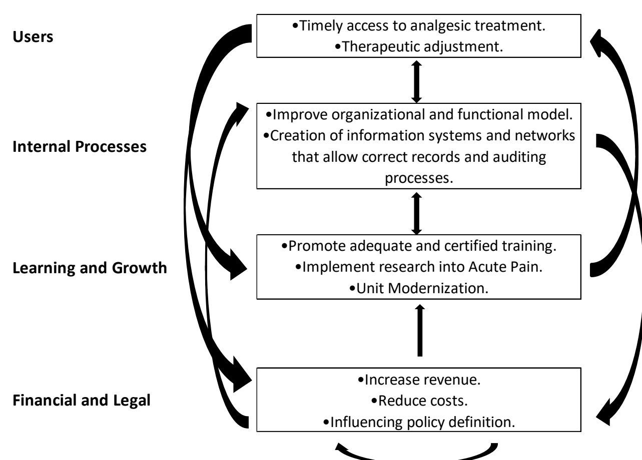

Fig. 1 Strategic Map

From the relationships, we can determine that a «Financial and Legal» perspective is directly related to «Learning and Growth» and the «Internal Processes». New revenues will generate more training, research and modernization of the unit («Learning and growth systems»), which will allow investments in information («Internal Processes»). There is also a reciprocal relationship in this perspective, as it relates to itself: the public perception of the service can influence budgetary issues.

The perspective of «Learning and Growth» is directly related to «Internal Processes» and «Users». Training and modernization provide organizational opportunities for the creation of improvements in information systems («Internal Processes») and allow the development of capacities that improve or extend services («Users»).

The «Internal Processes» perspective is directly related to «Users», «Learning and Growth» and «Financial and Legal». Improvements in the organizational and information system imply natural advantages in the provision of services and greater satisfaction among users; better internal processes identify training needs and make services more efficient with a reduction/adjustment treatment («Finance and Legal»).

The level of «Users» has direct consequences on all other perspectives. The lack of satisfaction due to the services provided can lead to procedural changes («Internal Processes») and promote new training needs («Learning and Growth»). Users' satisfaction can improve service perception, with a possible positive impact on value («Finance and Legal»).

IV. Conclusion

This work proposes a BSC designed according to the particular context of an APU, and developed in close relation with collaborators interested in its success. It corresponds to perceived needs and problems that urged an organizational reassessment by those responsible for the APU.

In this specific case, the BSC model directly addressed problems identified in the unit. Some of these are problems of organizational indiscipline with a lack of definition of objectives and goals, the weak integration of the APU with the other services of the hospital unit, the imprecision of internal processes and the absence of protocols and the absence of a training program.

The entire model of the BSC helps to formalize an articulated and integral view of the APU that disciplines its management – as desired by those responsible. The continual process of designing the BSC coherently guides the management into a thriving path, raising an awareness that disposes to responsible actions addressing the unit´s shortcomings. It shows the BSC as a credible hypothesis for the management discipline of health units, through adaptations that do not question its fundamentals. Regarding the application of the standard model, there is a minor relative preponderance of financial issues, but the defining concern to attend at all the constituents of the organization and its influences are strongly present.

This paper contributes to the studies of the design of the BSC in the hospital context. It highlights the effort in aligning strategic goals with a clear vision of the organization and the need to define plausible and rewarding initiatives and aims.

References

[1] R. Kaplan and D. Norton, "The balanced scorecard measures that drive performance," *Harv. Bus. Rev.*, vol. 70, no. 1, pp. 71–79, 1992.
[2] J. Luft and M. D. Shields, "Mapping management accounting: graphics and guidelines for theory-consistent empirical research," *Accounting, Organ. Soc.*, vol. 28, no. 2–3, pp. 169–249, Feb. 2003.
[3] R. Kaplan and D. Norton, "The Office of Strategy Management," *Strateg. Manag.*, no. October, 2005.
[4] G. R. Baker and G. H. Pink, "A Balanced Scorecard for Canadian Hospitals," *Healthc. Manag. Forum*, vol. 8, no. 4, pp. 7–21, 1995.
[5] J. M. Santiago, "Use os the Balanced Scorecard to Improve the Quality of Behavioral Health Care," *Psychiatr. Serv.*, vol. 50, no. 12, pp. 1,571-1,576, 1999.
[6] D. Dziuk, "So Many Systems, So Little Communication," *Health Manag. Technol.*, vol. 22, no. February, pp. 50–51, 2001.
[7] V. K. Sahney, "Balanced Scorecard as a Framework for Driving Performance in Managed Care Organizations," *Manag. Care Q.*, vol. 6, no. 2, pp. 1–8, 1998.
[8] D. Weber, "Performance Management-the Balanced Scorecard: A Framework for Managing Complex and Rapid Change," *Strateg. Healthc. Excell.*, vol. 12, no. 11, pp. 1–7, 1999.
[9] G. R. Beauchamp, "The five ´S´ Levels of Enterprise Health," *Physician Exec.*, vol. 25, no. 3, pp. 25–29, 1999.
[10] J. R. Griffith, "Championship Management for Health Care Organizations," *J. Helthcare Manag.*, vol. 45, no. 1, pp. 17–30, 2000.
[11] M. Souissi and K. Ito, "Implementing and Cascading the Balanced Scorecard: The Case of a Danish Hospital," *J. Accounting, Ethics Public Policy*, vol. 19, no. 2, 2018.
[12] L. G. Aidemark, "Cooperation and competition: Balanced scorecard and hospital privatization," *Int. J. Health Care Qual. Assur.*, vol. 23, no. 8, pp. 730–748, 2010.
[13] X. Y. Chen, K. Yamauchi, K. Kato, A. Nishimura, and K. Ito, "Using the balanced scorecard to measure Chinese and Japanese hospital performance," *Int. J. Health Care Qual. Assur.*, vol. 19, no. 4, pp. 339–350, 2006.
[14] J. Y. Karisa and L. Wainaina, "Balanced Scorecard Perspectives and Organizational Performance: Case of Kenyatta National Hospital, Kenya," *Int. J. Bus. Manag. Entrep. Innov.*, vol. 2, no. 3, pp. 102–113, 2020.
[15] J. Boston, J. Martin, J. Pallot, and P. Walsh, *Public Management: The New Zealand Model*. 1996.

Open Science Index, Economics and Management Engineering Vol:16, No:5, 2022 publications.waset.org/10012549.pdf