Designing a dashboard for evaluating the performance of urban transport: Case of Balanced Scorecard

Imane MOUFAD, Fouad JAWAB

Abstract — The problems of performance are increasingly critical, particularly in the urban transport sector. The involvement of several complex dimensions by multiple actors, and the need continues to provide quality transportation makes it difficult for the authorities. This article aims to develop an integrated frame for the assessment of the strategic performance of urban transport by using the Balanced Scorecard (BSC). The latter provides an integrated mechanism of a set of performance indicators that meet the diverse needs of actors in this sector. In this work, we present, at first an art status of the Balanced Scorecard, its architecture and pillars. We develop subsequently design methodology of BSC for urban transport. These include the identification of performance attributes, development of the strategic map and identification of performance indicators at each axis of the BSC. Finally, we present a demonstration of the BSC for urban transport in the city of Fez.

Index Terms — Urban transport; performance; indicator; Balanced Scorecard.

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1 INTRODUCTION

The problems of performance are more and more crucial, especially in the sector of urban transport. The existence of several dimensions (social, human, economic, environmental, institutional, etc.) by considering multiple objectives and multiple actors, and the need continues to provide quality transportation makes it difficult for governments. This article aims to develop a Balanced Scorecard (BSC) as an integrated evaluation mechanism of a set of strategic performance indicators in the urban transport sector. The sequential methodological steps of the development of BSC include three parts. In a first part, a state of art of Balanced Scorecard. Its architecture and its pillars. We develop later, the methodology of conception of BSC for the urban transport. These include the identification of performance attributes, development of the strategic map and identification of performance indicators at each axis of the BSC.

2 THEORETICAL APPROACH OF BALANCED SCORECARD

2.1 Definition

The Balanced Scorecard (BSC) is a method thrown in 1992 by Robert Kaplan and David Norton who gives to the leaders a framework to translate their strategy into consistent group of indicators of performance according to four main perspectives: learning, processes, clients and finances [1]. The originality of BSC is fond of two major principles: the multidimen-

sional character of performance and existence of a subjacent model linking up these different indicators between them [8]. It is seen as a means of performance evaluation. It is a suitable tool to improve the change in companies through the introduction «of physical indicators, of indicators not produced by the firm, of indicators on environment, or else transverse indicators». As a result, it has as purpose a synoptic representation of the present and future, passed performances of the organization [2].

2.2 Architecture of the Balanced Scorecard

The important word in Balanced Scorecard is "Balanced" since it focuses on the concept of balance. The Balanced Scorecard is primarily a measure of system performance balanced between the financial and non-financial indicators, short and medium / long-term objectives, and the external indicators for partners and customers and the internal indicators on essential processes and innovation, the development of competences and growth (see Figure 1).

Fig.1. Equilibrium of BSC.

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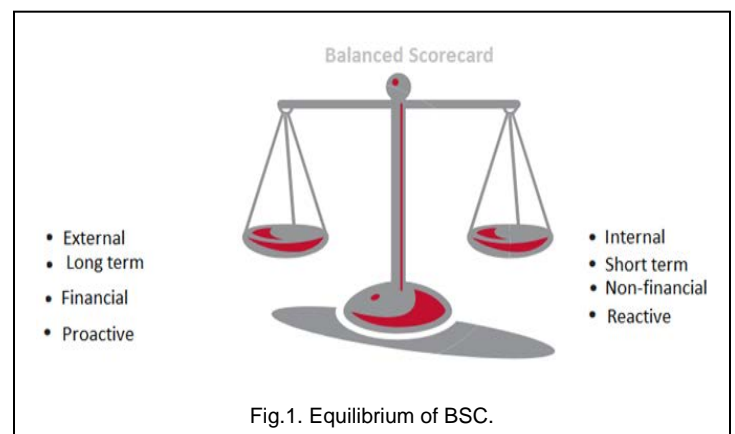
The basic assumption is that the BSC has a strategic map. It must highlight the relations between objectives and indicators in different coherent domains, so that these objectives are validated and so that they serve for guiding actions [13]. The Strategy Map is thus the keystone of the BSC project framework. It allows to "materializing" the passage of the expression of the strategy for the creation of proper values.

2.3 The perspectives of the BSC

As we have seen, the BSC aims to assess the performance in four complementary perspectives:

1) Financial Perspective

The financial indicators of a dashboard of supply chain are classic and generic A supply chain which works well should be translated for all actors by stronger margins, reduced unit costs, improvement of the finance, increase of the turnover and better return on investment for all actors of the chain [3].

2) Customer Perspective

This axis reflects the concern to satisfy customers. Improvements for all of these customers must include better quality products and services, shorter time execution, greater availability, more flexibility and therefore greater value for the end consumer [7].

3) Internal Processes Perspective

The quality of services delivered to customers is directly dependent on the performance of the process. It is important to identify the key processes that can improve the Offer and consequently the profitability served to shareholders. The objective of this axis is to take into account all the internal processes, particularly innovation, customer management and operational excellence.

4) Organizational Learning Perspective

This axis involves three parties: the staff, systems and procedures. The Progress to be measured focuses on staff training to access new skills, improving the information system and the matching procedures and practices

3 DEVELOPMENT OF THE BSC FOR URBAN TRANSPORT

In this section we describe the methodology used in developing the BSC in the urban transport sector. In this sector, the majority of studies was carried [5] considered the following steps, namely: identification of performance attributes, development perspectives and themes, development of the strategic map, the identification of set of indicators and analysis.

3.1 Identification of attributes of performance

Traditionally, BSCS of the public sector considered three important attributes of performance: "training and innovation" (or contribution), "internal process", "financial and "customers" (or result) in the measure of performance [5]. Urban transport is a big industry, striving continuously for performance goals, as well as facing challenges in meeting the needs of multi face and interests of multiple stakeholders. It is therefore important to adopt the four attributes in the development of BSC for urban transport.

3.2 Development of perspectives and of themes

On the basis of what is discussed before, and to respect the complex character of the urban transport sector, we customize "customer perspective" by "social perspective" and "financial perspective" is replaced with "economic perspective". Since the urban transport is a sector in big ladder, there was the significant participation of the process of this sector and of activities in those of other sectors. Therefore, we customize "internal process perspective" by the "Process perspective". Kaplan and Norton [3] argue that the choice of themes for the internal process perspective is more specific to the sector / organization, however, it should always be guided by the concept of the question: so to satisfy the citizen, the government and other stakeholders, which processes must we excel? In addition, we customize the "learning and innovation perspective" by the "organization and innovation perspective". Since this is not a mere institution, but multiple institutions with complex aspects. The proposed framework for the BSC urban transport is shown in Figure 2:
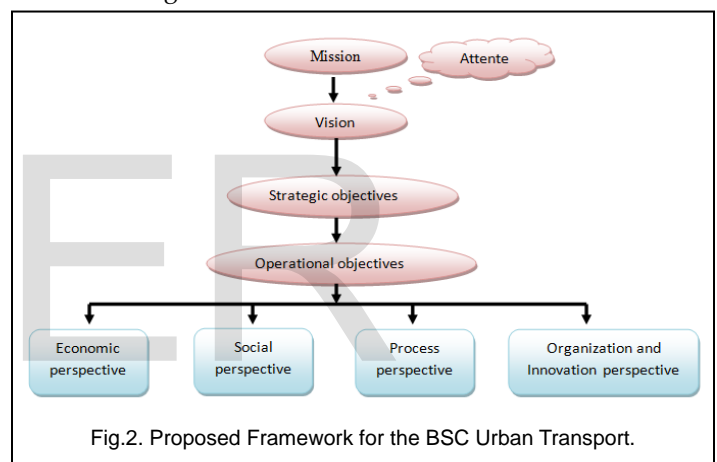

Fig.2. Proposed Framework for the BSC Urban Transport.

3.3 Identification of performance indicators

According to Fernandez, an indicator is information or a compilation of information contributing to the appreciation of a situation by the decision maker [6]. The indicator is not limited to the finding and allows dynamic real-time management. The Balanced Scorecard indicators are called performance indicators. At our level, this is to define, for each strategic axis, a set of indicators to measure the achievement of its objectives.

1) The criteria for selection of indicators

In the indicator set for developing the BSC urban transport sector, researchers and practitioners often provide and use a simple set of indicators that is based on the strategic objectives of the sector, easily understood to the public as well as all levels of employees, easily applicable and does not require complex information that is often unavailable [5]. So in developing the BSC, the indicator must: Be usable in real time; Measuring one or more goals; Inducing action; Being relevant; not to designate one and the same reality; and easy to use, attractive and presented uniformly.

2) Determination of indicators

1. Social perspective

In studies of BSC of public sector, indicators for social perspective include: accessibility [5]; quality service; security [5]; and comfort. In the urban transport, social perspective has the intention of guaranteeing social satisfaction and development by means of the service disposition of competitive transport. Unlike many other public sectors, a social indicator mattering from urban transport is the growth of job, because the accessibility of transport, services and network have a significant role on the creation of possibilities of job [5].

2. Economic perspective

In urban transport, the objective of the economic perspective is to ensure dynamic economic growth with improved income in order to maintain the financial viability of urban transport. From the point of view of stakeholders, the main parts of the economic outlook are, first, users and citizens / local community, looking for an effective transport system that helps them to grow economically in the context of national development; secondly, the government / urban authority or political parties who were concerned about the economic growth of urban transport to maintain the national or local development; and thirdly, funding agencies, which seeks financial returns and economic growth through investment. Indicators of the economic perspective should reflect the interests of these stakeholders.

3. Process Perspective:

Strategically, the aim of the process perspective is to ensure effective internal operations that will lead to the achievement of strategic goals of the sector by meeting internal and external stakeholders involved in the process. In urban transport, the process perspective has four major themes: "built environment and land development", "the steering means of transport ", "user behavior management and "operational efficiency".

4. Organization and Innovation Perspective :

The goal of this perspective is to ensure effective institutionalization with improved knowledge and ability and lifelong learning by the reaction, research and innovation activities that will support the urban transport system to accomplish its strategic objectives. In this sector, the organizational perspective and innovation has three major topics: "Institution and Leadership", "capacity and well-being" and "Learning and Innovation".

Table 1 illustrates the set of indicators for each perspective.

TABLE 1
THE PERFORMANCE INDICATORS OF BSC FOR URBAN TRANSPORT

Perspectives	Indicators	
Economic	• Operating ratio: total product divided by the cost (operating + capital depreciation) • Volume of Passengers: daily service users by means of transport • Investment expenditures: Investment Volume • Average age of the vehicle fleet	
Social	• Physical Access: commercial Kilometers per capita urban perimeter; Number of stops accessible • Access time: Amplitude Service • The level of service and comfort (Development of a questionnaire) • The safety improvement: Number of complaints to the travel pattern of incidents • The employment growth: Number of jobs created	
Process	Built Environment and Spatial Planning	• Land development and integration of transport • Management of transport infrastructure • Management of parking facilities
	Management of transport	• The vehicle control • Traffic • Roads Management
	User behavior Management	• Citizen awareness rate • Respect for road safety
	The operating efficiency	• Operator Capacity • Collection of price • The ability to control • The traffic management and incident
Organisation & Innovation	Institution and Leadership	• Coverage and institutional integration • Leadership and political dynamics
	Capacity and wellness	• Skill Development and Training • Social assistance of employees
	Learning and Innovation	• Innovations and Best Practices • Research and Development

4 CONCLUSION

This study has developed an integrated mechanism for strategic performance evaluation for urban transport is crucial to the progress and competitiveness cities. The BSC for urban transport provides a built considering all the dimensions in urban transport with their performance drivers. The BSC for urban transport transferred the vision and strategy of the leaders in a balanced set of performance indicators that meet the diverse needs of stakeholders in the sector.

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