Measuring Performance in a City Water Company through a Dynamic Balanced Scorecard

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ABSTRACT

In order to promote public utilities' competitiveness and continuous improvement, in some countries there are public bodies (so called 'regulators') that periodically publish rating reports, including performance measures aiming to set benchmarks, in order to compare results achieved by different companies. Likewise, several public utilities have been running on the way of continuous monitoring qualitative key-measures. Those performance measures are not only referred to the financial dimension, but also to 'soft' parameters such as quality, service, company image, internal process efficiency. At least in the long run, such parameters tend to dramatically impact on financial results.

Furthermore, monitoring the dynamics of non-monetary performance indicators is a necessary step to understand the company's attitude to satisfy those needs it exists for. Such an attitude is a pre-requisite for achieving financial targets and long term survival and growth.

Classical management accounting models seem to have limitations in performance measurement, particularly when referring to the evaluation of soft variables. Many companies, for instance, apply the Balanced Scorecard (BSC), following the classical approach suggested by Kaplan R. S., and Norton D. P.. Anyway, it has been argued, that the classic BSC presents some limitations to support the strategy formulation process. According to Linard, its original frame, the BSC lacks a proper consideration of some dynamic aspects such as:

- A proper consideration of delays between actions (causes) and results (effects) indicated by the dynamic of key performance variables;
- A feedback loop framework of the different perspectives.

In this paper, we present an SD-based BSC, developed upon an analysis of a municipal water company, **AMAP SPA**, located in Palermo (Italy). In the model, we describe some key sectors of the company managing system, related in particular with the following performance indicators:

- Supply quality (e.g., water cleanness);
- Availability (e.g., infrastructure capacity to meet demand, also relating to maintenance, water pressure);
- Reliability (e.g., repairing time after a service breakdown);
- Customer satisfaction (e.g., referring to company's attitude to constantly inform customers about potential accidents which might cause a service breakdown).
- Efficiency & Profitability

Concerning the measurement of the above key-issues, three important aspects have been considered:

- A proper parameter selection, aiming to pursue a trade-off between analysis and synthesis;
- A simple and reliable data gathering to avoid manipulation;
- A suitable understanding of managerial processes (including technical, organisational and financial implications) and feedback relationships between key-variables, in order to sketch a model that could explain the dynamics of the relevant system, as a result of the direct involvement of the management from different business units.

Main performance indicators embodied in the balanced scorecard implemented in such a firm refer to the following perspectives: learning and growth, internal processes, customer, and financial. A set of five policy levers has been identified:

1. Desired time to replace pipelines, influencing the internal process perspective;
2. Desired number of auxiliary workers, influencing the learning and growth perspective;
3. Desired number of suspension workers, influencing the internal process perspective;
4. Desired dividend percentage, influencing the financial perspective;
5. Desired recycling ratio, influencing the internal process perspective.

The open loop approach – in the identification of causal relationships between the four perspectives – is here replaced by the SD approach that takes into a proper consideration some potential sources of complexity. This synthetic application of system dynamics and balance scorecard does more than just measure performance. Through illuminating the links between strategies, measures, and expected outcomes at different levels in the company, it could motivate staffs to make the company's vision happen; by analysis and modelling of the structure underlying the phenomena and behaviours, it supplies a decision-making tool based on simulations both in short term and in long

term which also helps the managers get advance understanding about the relation of the decisions and the performance.

In a public utility company, such as **AMAP S.P.A.**, the systemic view of strategic objectives and of the related performance indicators – provided by the SD-based BSC – could allow the managers to:

- Assess managerial efficiency and effectiveness;
- Detect and set policy-levers to improve performance;
- Outline targets referred to different business areas and link them to compensation and career systems;
- Discern about causes related to unexpected results, and distinguish the controllable from non- controllable ones;
- Provide an important tool to communicate company's social strategy to several stakeholders (e.g., citizens/customers, political counterparts) in order to clarify undertaken policies, and to promote company's commitment towards efficiency and effectiveness;
- Benefit by a tool to support the negotiation and allocation process of resources needed. A system dynamics simulation model enables decision-makers to analyse, both expected and actual results, thereby supporting communication with political counterparts.

The paper also discusses about some difficulties encountered mainly in the data acquisition process. Particularly, the acquisition of numeric data turned out to be extremely difficult because of the poor information system of the company. Furthermore, managers showed unexpected resistances in the mental model elicitation process. Potential further developments of the project and the possibility to transfer the gathered knowledge into other domains are finally discussed in the paper.

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