Chapter 29

Big Data Analytics and Visualization of Performance of Stock Exchange Companies Based on Balanced Scorecard Indicators

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ABSTRACT

One of the major concerns of managers at stock exchange companies is the maximum and efficient use of limited resources to meet the unlimited users' demands and in particular, investors and company owners. Achieving this goal gets more complex everyday due to the changing environment and multidimensional economic pressures. It is necessary that managers know the process of effective data oriented measurement in every single aspect of a successful business. One of the most accredited and useful methods for evaluating performance is the Balanced Scorecard (BSC). In this chapter, researchers have focused on providing a model that evaluates the performance of companies based on a combination of BSC indicators and big data analytics and algorithms. The chapter's purpose is to indicate which analytics algorithms are most appropriate for each BSC indicator based on a deep review of broad literature as a measurement guideline for future researchers and practitioners.

INTRODUCTION

Balanced Scorecard (BSC) and algorithms for Big Data analytics are key tools to the implementation of an effective organizational evaluation strategy. The main advantage of Balanced Scorecard (BSC) is that it not only focuses on short term financial goals but it also helps to achieve the non-financial objectives to better achieve the strategic goals. A comprehensive evaluation that is reliant on BSC has four main aspects:

1. **Financial**: Profitability and value created for shareholders.
2. **Customer**: Success in the market in which the company operates based on customer satisfaction.
3. **Internal Business Processes**: Operations within an organization that create value for customers.
4. **Learning and Growth**: The capabilities of people and systems that support internal operations.

The conceptual framework of this research is based on a literature review of BSC oriented papers and books as well as helpful Big Data analytics algorithms utilized for analyzing the BSC indicators measurement. As a result, a rich table is developed for connecting the BSC indicators to possible Big Data algorithms. A simple brief table has been provided here to create a preliminary perception on the final outcome that is a much more in-depth endeavor useful for scholars and practitioners in the field.

LITERATURE REVIEW

The concept of the Balanced Scorecard (BSC) was first presented in the early 1990s. By 2000, some surveys indicated that a majority of firms in the United States, the United Kingdom and Scandinavia used scorecards or at least intended to do so soon. Others, like Bain's management tools survey indicated a slight drop in usage to 36% but with a high average satisfaction with the tool. The number of software packages for scorecards on the market is growing and now exceeds 100. In only 10 years, the idea of the BSC has certainly made its mark. At the same time there are reports of high failure rates. We have seen firms abandon their scorecard efforts. Others are struggling against the perception of the BSC as 'just another three-letter fad' propagated by consultants such as Total Quality Management (TQM), Business Process Reengineering (BPR), and Activity-Based Costing (ABC).

Developing the scorecards usually makes people see their company and its business model in a new way. This often leads to new ideas about the company's vision and to a reconsideration of its strategy. Scorecards help to introduce strategic thinking into planning and control. The task of each business unit has to be agreed upon and related to the overall purpose of a corporation. To provide strategic direction and to monitor progress, corporations with a strong common identity will usually want to introduce scorecards from the top. Strategic guidance is possible also in other ways and other types of controls can be used. If the strategic role is sufficiently clear, then parts of a corporation may embark on scorecard projects for their internal benefit. There are also cases where *only* the corporate level uses scorecards. This may be because the firm is in an early stage of its scorecard project and will later extend its use to successive levels and units.

Performance measurement systems that translate an organization's strategic goals into a set of interlinked financial and non-financial objectives are commonly used in organizations. The focus on multidimensional, long term performance is consistent with the international emergence of "strategic management accounting" as a major contributor to strategy formation and achievement (Cadez & Guilding, 2008). An example of a multidimensional performance evaluation system is the Balanced Scorecard (Kaplan & Norton, 1996, 2000).

The Balanced Scorecard (BSC) assists top management in communicating strategic goals to lower level managers by explicitly linking these goals to congruent and actionable performance targets and in evaluating management performance in pursuit of those targets. Moreover, the BSC supports long term strategic performance by emphasizing the importance of meeting leading non-financial targets (e.g.,

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