Chapter XXVI
Automated Interpretation of Key Performance Indicators by Using Rules

Bojan Tomic
University of Belgrade, Serbia

ABSTRACT

Business reporting is an essential task for every enterprise. In order to make appropriate decisions, decision makers need quality reports. Some recent articles suggest that reports generated by BI (Business Intelligence) systems contain mostly data (key performance indicator values) and little or no information. Data has no meaning and must be interpreted in order to become information. Information is, naturally, much more useful because it directly contributes to recipients' knowledge and can be acted upon. The consequence is that it is left to the decision maker to manually analyze large quantities of data presented in individual reports in order to derive information. A potential solution for automated business data interpretation is presented in this chapter. It proposes using rules to capture and formalize business knowledge and then utilizing these rules to infer information from data automatically.

INTRODUCTION

Decision makers need accurate and relevant data and information in order to react to various business situations appropriately. Business goals, strategies and policies reflect current state of business, and the only way to get informed is through reports. Therefore, it can be said that one of the key elements of any business information system is the reporting system.

Reporting systems have evolved through time from paper-based, spreadsheet manual reporting to modern, computerized systems where reports concerning any aspect of business can be generated automatically at the touch of a button. Nowadays, users can specify themselves what kind of report they want and how it should look and then get it in a few seconds. This is a big improvement because the whole process is more efficient and users are not constrained to a small set of predefined reports.

But, what about effectiveness? Are these reports useful? Some recent magazine articles and interviews with professionals in this area reveal

that there might be a problem of "too much data and too little information" (Gnatovich, 2005; Whiting, 2002; Wise, 2008). Furthermore, they suggest that in order for a decision maker to acquire information and gain an insight into business performance, he/she must manually sift through large amounts of data, and that customized reports are just not enough. Although these claims have not yet been scientifically proven, they could be seen as an indicator of what is wrong. In order to better explain a view of this problem, it is important to distinguish data from information.

Most scientists agree that *data* becomes *information* when *meaning* is added to it (Floridi, 2005, pp. 353). Also, it must be pointed out that information contributes to the knowledge of the recipient.

Business reports contain key performance indicator values presented in a suitable form. *Key performance indicator* (KPI onward) is "a significant measure used on its own, or in combination with other key performance indicators, to monitor how well a business is achieving its quantifiable objectives" (Georgetown University, 2008). Examples are: profit (by product, by market etc.), expenses, market share etc. KPI values can be presented using a spreadsheet, graph etc. But, no matter how it is presented, KPI consists mostly of data and has little or no meaning. Therefore, KPIs themselves contain very little or no information. This can be demonstrated by using a very simple example.

Let's say that a product manager wishes to see how well some product is doing on the market. The first KPI that needs to be analyzed is profit. The manager must look at the value of overall profit for the current year, the past year, for each individual market and segments within, and then deduct the real status of the product. Each of these profit aspects can be presented by a graph or table, so he/she needs to analyze them individually in order to gain an insight and see whether profit is on the rise, stagnant or declining, whether product sales concerning some market segment are declining etc. This applies to all other KPIs as well: product expenses, product market share, etc. So, it becomes obvious that KPIs, no matter how they are presented, contain mostly data and little or no information. **The user is the one who manually analyzes data, adding meaning to it and transforming it into information.** So, is there another approach to creating information from KPIs that can substitute the current one?

It seems that an ideal solution would be to automate this "data-to-information" transformation process. **It would then be up to the reporting system to create reports that contain information as well as data.** This implies that information would be derived without human involvement, making it accessible anytime, anywhere and at a touch of a button. On the other hand, decision makers would be greatly relieved of the data analysis burden. The key to understanding how this can be achieved is by realizing what is necessary to create information from data.

This chapter summarizes the results of our ongoing research activities in this area. The main objective is to introduce readers with a **potential solution for improving the quality of reports generated by reporting systems by raising the quantity of information they contain**. Individual objectives include:

- Providing a short "state-of-the-art" in the area of reporting systems
- Presenting a new approach for automated transformation of business data (KPI values) into information.
- Presenting appropriate system architecture for integrating the proposed solution into a reporting system.
- Presenting some implementation notes concerning development of a prototype.
- Providing discussion about the proposed solution, it's viability and potential future research