Chapter 12
Proposal of Analytical Model for Business Problems Solving in Big Data Environment

Goran Klepac
Raiffeisenbank Austria d.d., Croatia

Kristi L. Berg
Minot State University, USA

ABSTRACT

This chapter proposes a new analytical approach that consolidates the traditional analytical approach for solving problems such as churn detection, fraud detection, building predictive models, segmentation modeling with data sources, and analytical techniques from the big data area. Presented are solutions offering a structured approach for the integration of different concepts into one, which helps analysts as well as managers to use potentials from different areas in a systematic way. By using this concept, companies have the opportunity to introduce big data potential in everyday data mining projects. As is visible from the chapter, neglecting big data potentials results often with incomplete analytical results, which imply incomplete information for business decisions and can imply bad business decisions. The chapter also provides suggestions on how to recognize useful data sources from the big data area and how to analyze them along with traditional data sources for achieving more qualitative information for business decisions.

INTRODUCTION[1]

Data mining as a discipline brings a completely new direction on business planning from the last decades. Developing churn models, fraud detection models and customer segmentation have become an important element for successful business in conditions where market competition exists. Data mining has become a tool for reducing uncertainty and tool for business planning. It also has a role as a decision support instrument. Even mentioned techniques rely on huge amounts of data, in the very beginning, sources for analysis were mostly local transactional databases and local data warehouses. When a company needs to develop strategy against running churn rate,

it mostly relies upon existing local transactional data or data warehouse for the modeling purposes. Similar situations for other types of problems like fraud detection or segmentation are also common. Mentioned strategies have leaned on huge amounts of data usage for finding useful patterns, mostly on local data sources.

The big data era brings new challenges, not only relative to bigger quantities of data from external and internal data sources. But also, the big data era brings with it a whole new way of strategic, analytical thinking which connects the traditional approach by using data mining techniques within internal databases, along with data sources as forums, blogs and social networks in finding the right answers for solving business problems. All of which demands a different approach in designing analytical solutions and demands new ways for analytical models to be integrated.

This chapter will offer solutions to make efficient analytical strategies from the perspective of the big data era, when companies are faced with problems like churn, fraud or segmentation. Solutions will be illustrated through a retail case study to illustrate presented methods and techniques.

Key factors of success in big data era analytics include using internal database sources as well as external sources reachable online, like blogs, social networks, forums and other data sources along with appropriate data mining or analytical method.

Traditional data mining approach, which is commonly used, offers well known methods typically used on internal data sources. External data sources along with traditional data mining methods offer solutions for the use of text mining methods, social network analysis and expert systems which can be centrally placed for the integration of differing aspects of analysis depending upon the strategic business or/and analytical aims. Looking in that direction, answers for churn detection and mitigation of contract breaking by clients could be extracted in combination from predictive models, developed on local data sources

and text patterns from forums or blogs, as well as from social networks like Facebook, twitter or other, by using appropriate analytical techniques.

Appropriate analytic strategy, which consolidates internal and external data sources, can show a holistic picture of an actual company's problems such as:

- Segmentation.
- Fraud detection.
- Churn detection and mitigation.
- Prospective customer value calculation.
- New product planning.
- Customer satisfaction survey.
- Best next offer prediction.

Such problems could be solved much more efficiently with a better understanding of causalities which have caused the problems. Thus providing a much more realistic and complete picture, which should be better for business decisions and/or strategic business thinking.

The chapter will also present one real business case from the domain of churn detection/ understanding in a retail company which was ultimately solved, using the proposed analytical strategy. Within that case study traditional predictive data mining methods and attribute relevance analysis were used on local databases, together with social network analysis and text mining on external data sources the result were consolidated. As a result of consolidation, new facts important for making efficient business strategy were revealed. This chapter will demonstrate the importance and influence of business needs, and a reflection on the analytical strategies from the perspective of big data problems.

BACKGROUND

Big data phenomena, which manifested on exponential growth of data size, demands new approaches on data analytics and innovative methods

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