Chapter 32

Widely Applicable Multi–Variate Decision Support Model for Market Trend Analysis and Prediction with Case Study in Retail

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ABSTRACT

Chapter explains efficient ways of dealing with business problems of analyzing market environment and market trends under complex circumstances using heterogeneous data source. Under the assumption that used data can be expressed as time series, widely applicable multi variate model is explained together with case study in textile retail. This Chapter includes an overview of research conducted with a brief explanation of approaches and models available today. A widely applicable multi-variate decision support model is presented with advantages, limitations, and several variations for development. The explanation is based on textile retail case study with model wide range of possible applications in perspective. Complex business environment issues are simulated with explanation of several important global trends in textile retail in past seasons. Non-traditional approaches are revised as tools for a better understanding of modern market trends as well as references in relevant literature. A widely applicable multi-variate decision support model and its usage is presented through built stages and simulated. Model concept is based on specific time series transformation method in combination with Bayesian logic and Bayesian network as final business logic layer with front end interface built with open source Bayesian network tool. Explained case study provides one of the most challenging issue in textile retail: market trends seasonal/weather dependence. Separate outcomes for different scenario analysis approaches are presented on real life data from a textile retail chain located in Zagreb, Croatia. Chapter ends with a discussion about similar research's, wide applicability of presented model with references for future research.

INTRODUCTION

In past several years modern society is witnessing very strong increasing trend of technology availability and technology appliance in all aspects of life, influencing society in general. Following that trend, global market participants become more and more connected while at the same time markets became more and more global and therefore harder to analyze and understand. Although globalization implies faster communication and exchange of knowledge, large number of different influences and speed of changes are constantly increasing. Following changing environment and mentioned characteristics, to create efficient analysis and forecast system for market analysis is becoming more and more important, for some market participant crucial in order to survive. It is known that market trend estimation is always certain kind of guessing. That theory is part of many researches including some of the world's greatest economists (Rodrik, 2011).

Modern approach simply takes one-size-fits-all approach as obsolete while it explores modern analytic methods and combination of methods powered with technology to create market simulation models. In this chapter widely applicable decision support model for market environment and trend analysis will be explained together with methodology how to use model concepts as base for different influence and correlation analysis between market factors. Complexity of modern market environments, number and nature of different influencers including global changes and trends, implies strong and raising need for robust and widely applicable models. Those model's goals is to open perspective for defining and simulating complex markets, to provide ability to acquire certain criteria and to focus only on important points in order to provide crucial information for decision making managers. This chapter explains innovative, applicable, robust and very efficient approach (Mršić, 2012) and corresponding model.

Although there is strong need for robust methodologies of this kind, researchers were so far limited in wide number of factors needed for model to be applicable in real market environment. Traditional approaches were mostly focused on either analyzing attributes one by one and then combining results of those analysis in separate projects (Ramya & Pradeep, 1999) or focused in creating very simplified data samples not adequate for describing complex market circumstances (Frank et al, 2001). Although there were several inspirative researches, their perspective in business use is limited. Furthermore, for some specific business questions, like how to analyze weather forecast influence on market trends in textile retail, those researches only points out that efficient methodology should be defined in years to come (Frank, Garg, Sztandera, & Raheja, 2003). As major limitations, those researches pointed out complex environment (hard to simulate and analyze) and heterogeneous data (sales of different merchandize groups, weather data, etc.). Therefore models could only be built by extracting small samples from data source (for example two attributes) and analyze it in group making very hard to conduct complex environment analysis or on-line data processing.

Presented model was formed combining author's strong retail background and understanding importance of robust methodology together with specific issues in textile retail. Because of number of influences on consumer behavior in textile retail, area is known as one of most complex to analyze and predict what makes this model more important for further researchers.

BACKGROUND

Markets are moving force of modern economy. Almost all market activities could be explained like "buying" or "selling" different merchandize and/or service. Those facts imply strong motivation of all market participants to understand,

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