Chapter 23
Data Mining Models as a Tool for Churn Reduction and Custom Product Development in Telecommunication Industries

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ABSTRACT

This chapter represents the business case in the telecommunication company called Veza, in domain of churn prediction and churn mitigation. The churn project was divided into few stages. Due to limited budget and cost optimization, stage one was concentrated on prospective customer value calculation model based on fuzzy expert system. This helps Veza company to find most valuable telecom subscribers. It also helped company to better understand subscriber portfolio structure. Developed fuzzy expert system also helped Veza company in detection of soft churn. Stage two is profiling and customer segmentation based on time series analysis which provided potential predictors for predictive churn model. The central stage was concentrated on developing traditional predictive churn model based on logistic regression. This calculated probability that subscribers will make churn in next few months. The final stage was dedicated to SNA (Social Network Analysis) model development which found out the most valuable customers from the perspective of existing subscriber network. This model gave the answer that subscribers have the greatest influence on other subscribers in a way what is dangerous if they leave Veza company because they will motivate other subscribers to do the same thing. All three stages made complete churn detection/mitigation solution which take into consideration past behaviour of subscribers, their prospective value, and their strength of influence on other subscribers. This project helped Veza company to decrease churn rate and it gave directions for better understanding customer needs and behaviour which were the base for new product development.

1. INTRODUCTION

Churn detection and mitigation is often a topic in data mining literature (Berry, 1997; Berry, 2000; Giudici, 2003). Telecommunication companies are also interested in churn problem solving, especially in dynamic market environment (Klepac, 2006). Customer acquisition is important, but only as a starting point of each customer lifetime cycle. Companies attempt to extend customer lifetime period as long as possible in order to return initial costs and to make profit. "Production control, planning, and scheduling are forms of decision making, which play a crucial role in manufacturing industries. In the current competitive environment, effective decision-making has become a necessity for survival in the marketplace" (Elamvazuthi, 2012). Telecom companies are not the exceptions, and they also use advanced analytical models for better decision making in everyday business. "With the evolution of wireless technologies, mobile networks can provide much more interesting services and resources to users than before. Consequently storing, sharing and delivering resources efficiently have become popular topics in the field of mobile networks" (Feng, 2009). This is not the case only for wireless technologies, but for the telecom industry in general, and the other industries as well, which acts in competitive environment.bChurn modelling trend is present in technologies like IP TV, fixed phone line, and other services provided by telecom companies. There are many areas in telecom companies in which collected data could be useful for decision-making, and churn is one of them (Hemalatha, 2012). Churn prediction modelling is one of the major tasks in successful churn mitigation (Abbasimehr, 2011). Predictive data mining techniques plays major role in predictive churn model development (Kotsiantis, 2009). The reasons for the customer churn are diverse. They range from the unexpected moves of competition trying to gain a bigger piece of the market share by using swift campaigns (possibly directly endangering your company's market position) to the unsatisfied clients suddenly starting to churn (Berry, 2000). There are no available cookbooks methodologies regarding churn detection and churn prediction. In general, we can talk about some common approaches in churn detection, but it depends on situation and business area for which we try to build adequate model. For the purpose of churn mitigation and detection, it is not unusual to] chain several data mining methods and use analytical strategies, which fits in to the specific business problem. Traditional approach is mainly focused on using predictive models like logistic regression or neural networks, which calculates probability of churning. This could be sufficient in projects highly focused on client detection with highest evaluated probability of churn. Following case studies are much more complex, because Veza company, wants to understand existing client structure, their segments, their needs, product adequacy, customer values and motivators for service usage as a base for log term customer relationship management.

2. BACKGROUND

"The telecommunications industry was one of the first to adopt data mining technology. This is most likely because telecommunication companies routinely generate and store enormous amounts of high-quality data, have a very large customer base, and operate in a rapidly changing and highly competitive environment." (Weiss, 2009). Case studies based on churn detection are topic in several books (Berry, 2000; Berry, 2003; Giudici 2003). Common data mining approach for churn detection is using logistic regression (Larose, 2005; Larose, 2006), survival models (Berry, 2003), Neural networks (Alexander, 1995), Self-organizing maps (Kohonen, 2001). Mutual characteristic of denominated method is usage of historical data for future trends prediction. It is dominant approach in churn detection, but the fact

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