

# Chapter 10

## Data Mining for Health Care Professionals: MBA Course Projects Resulting in Hospital Improvements

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### ABSTRACT

*In this paper, the authors discuss a data mining course that was offered for a cohort of health care professionals employed by a hospital consortium as an elective in a synchronous online MBA program. The students learned to use data mining to analyze data on two platforms, Enterprise Miner, SAS (2008) and XLMiner (an EXCEL add-in). The final assignment for the semester was for the students to analyze a data set from their place of employment. This paper describes the projects and resulting benefits to the companies for which the students worked.*

### INTRODUCTION

This paper describes a data mining course which was offered as an elective for a cohort of health care professionals employed by a hospital consortium. The authors will provide a description of the program which was a traditional MBA degree program presented in a blended learning environment including a mixture of synchronous,

asynchronous and face to face sessions for all courses in the program. This paper will provide a detailed description of the course in which the students learned to use data mining to analyze data on two platforms, Enterprise Miner, SAS (2008) and XLMiner (an EXCEL add-in). This paper will focus on the final assignment for the semester which was a team project in which the students were asked to analyze a data set from their place of employment. There were four teams in the class and three of the teams had ac-

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cess to very interesting data sets from their place of employment. The fourth team had difficulty obtaining relevant data and decided to analyze published data from the most recent version of the General Social Survey. The other three projects were: (1) "Employment and Recruitment Diversity Assessment," an analysis of diversity hiring initiatives in an inner city hospital, (2) "Transcription Turn-Around-Time, a study of the time required to transcribe the initial interviews of patients admitted to one of the hospitals in the cohort, and (3) "CT Patient Safety," a study of the use of CT diagnostic testing in an emergency setting. This paper describes the projects in depth and resulting benefits to the companies for which the students worked.

## **BACKGROUND**

A synchronous online MBA program was offered to a cohort of health care professionals employed by several hospitals in neighboring towns, which are organized into a consortium with a common Board of Directors and officers. The students had diverse backgrounds and were employed in different departments in their organizations. There were several doctors and nurses, a physical therapist, human resources employees, business office employees, directors, administrators and staff. One member of the class was the Vice-President of Information Technology, who turned out to be an invaluable resource for any technology issues which arose in the program. The members of the class were assigned to groups of four or five which included diverse representation. These groups were to remain intact for all courses in the program and for extra required components of the program such as work camps and simulation week-ends. For the most part, the groups did remain intact, but some minor reassignments were made during the course of the program. The students developed strong allegiances in these groups which resulted

in some significant group projects produced in various courses in the program.

The program was a traditional MBA program in which the curriculum included required basic core courses in statistics, economics, management, marketing, and accounting, as well as advanced business requirements and several electives. The students had to agree on which elective courses they would take. They voted to select these electives from several offered by MBA faculty each semester. The class voted on the choice and all students then took the same elective. One of the core courses was a statistics course, which covered both basic and intermediate topics, including descriptive statistics, inference, linear and multiple regression and analysis of variance. This course was team-taught by the authors. The students were assigned real-data cases to analyze and found the material very useful in their work. A data mining elective was offered by one of the authors as one of several upper level electives from which the students could select. The students had enjoyed the statistics course and found it very useful to their work and so they chose the data mining course from among a group of electives offered.

## **DESCRIPTION OF THE DATA MINING COURSE**

The data mining elective was taught utilizing two software packages, XLMiner, an Excel add-in, and Enterprise Miner, a commercial product from SAS. SAS also provided a trainer's kit from their own course at a minimal cost to our students. This included power point slides, word files of each chapter, and data sets. The instructor felt that there should be some additional material and utilized a textbook, "Data Mining for Business Intelligence" by Galit Shmueli et al. (2008). This text has nice explanations of the data mining techniques with associated homework problems that utilized XLMiner. The XLMiner seemed to be a good addition to the course as it is fairly inexpensive

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