Data Mining Applications in the Hospitality Industry

Soo Kim
Montclair State University, USA

Li-Chun Lin
Montclair State University, USA

Yawei Wang
Montclair State University, USA

INTRODUCTION

Some people say that "success or failure often depends not only on how well you are able to collect data but also on how well you are able to convert them into knowledge that will help you better manage your business (Wilson, 2001, p. 26)." It is said the $391 billion restaurant industry generates a massive amount of data at each purchase (Wilson, 2001), and once collected, such collected data could be a gigantic tool for profits. In the hospitality industry, knowing your guests in terms of where they are from, how much they spend money, and when and what they spend it can help hospitality managers formulate marketing strategies, enhance guest experiences, increase retention and loyalty and ultimately, maximize profits. Data mining techniques are suitable for profiling hotel and restaurant customers due to their proven ability to create customer value (Magnini, Honeycutt, & Hodge, 2003; Min, Min & Emam, 2002). Furthermore, if the hospitality industry uses such data mining processes as collecting, storing, and processing data, the industry can get strategic competitive edge (Griffin, 1998). Unfortunately, however, the hospitality industry and managers are behind of using such data mining strategies, compared to the retail and grocery industries (Bogardus, 2001; Dev & Olsen, 2000). Therefore, there is a need for learning about such data mining systems for the hospitality industry. The purpose of this paper is to show the applications of data mining systems, to present some successes of the systems, and, in turn, to discuss some benefits from the systems in the hospitality industry.

BACKGROUND

Simply speaking, data mining is the use of the data from the warehouse to discover unpredictable patters, trends and threats through multidimensional analysis or on-line analytical processing, or OLAP (Peacock, 1998; Ross, 1997). The hospitality industry is known as a highly customer-centered business and accumulates large amounts of customer data from central reservation systems (CRS), property management system (PMS), point-of-sale (POS), and guest loyalty program databases. Therefore, data mining application can play a huge role in the hospitality industry (Monash, 2006). The volume of guest information collected via electronic transactions is greater than what humans can easily manage without the aid of technology (Magnini, Honeycutt, & Hodge, 2003). Data-warehousing and data-mining technologies can easily handle large and complex databases and assist hoteliers and restaurateurs in predicting future customers' behaviors, designing marketing campaigns, supporting market analysis, evaluating and refining loyalty programs, creating strategies, and conducting trends analysis (Buchthal, 2006; Singh & Kasavana, 2005; Magnini, Honeycutt, & Hodge, 2003; Min, Min & Emam, 2002; Rowe, 1999).

MAIN FOCUS

Success Story in the Restaurant Industry

As there has been a request for using the data information for hotels and restaurants to survive in a competitive world, Atlanta-based AFC Enterprises and Boston Market have achieved their goals through a data mining process. Using such data mining technique, they eventually try to cultivate more loyal customers, retain core customers, and maximize profits (Ross, 1997).

For instance, AFC first gathers customer-purchase data by item, day, and combination of them. Then, it stores the data in a data warehouse using AIX RISC 6000 hardware and a mix of software tools. While doing such process, the management clearly learns about what factors affect profits and promotions, and who loyal customers are. AFC also uses data mining techniques to manage cash management, inventory management, and customer relationship management (CRM). More successful exams are Red Robin International, a 135-unit casual-dining chain based in Englewood, Colorado and Pizzeria Uno. In additions, these two companies use data mining technique for changing menu or for giving instant and right information to the marketing department for promotions and for customer satisfaction.

Another case for successfully implementing data mining systems is a 13-unit Italian dinner-house, Louise's Trattoria. Luoise's Trattoria, which was bankruptcy in late 1997 and now successfully come back to the business, has been using analysis of credit-card transactions and customer-purchase data, part of data mining. President of this restaurant chain strongly believed that such credit-card transactions could give him more accurate information regarding his customers than traditional guest surveys did (Liddle, 2000; Magnini, Honeycutt, & Hodge, 2003).

Clever Ideas Inc. provides CLICK/Valued Member, the system that uses data collected from credit-card transactions and POS systems to better identify, track, reward, and communicate frequent diners. After having complete customers' information from credit-card transaction and POS systems, the company also sends direct-mail, a quarterly newsletter offering special events or menu changes, and a thank-you email to the frequent diners. Not only customers like such system, but employees like the system, because the employees can get tipped on the full amount (Waters, 2000).

Success Story in the Hotel Industry

Harrah's Entertainment (an official name of the company), a leading company in the hotel and gaming industry, has gained great success from a customer-service oriented strategy centered on data-mining techniques. In 1997, Harrah's hotels and casinos introduced a loyalty-card program "Total Rewards", which tracked customers' purchasing activities and provided incentives to visit Harrah's properties throughout the country (Loveman, 2003). Harrah's tracked customers' purchasing and gaming patterns and then provided its customers with most-effective incentives. Through data mining techniques, Harrah's developed quantitative models to predict lifetime value of its customer and used them to center marketing and service delivery programs in increasing customer loyalty (Bligh & Turk, 2004; Freedman, 2003).

Harrah's also discovered that 26 percent of its customers accounted for 82 percent of company revenue (Magnini, Honeycutt, & Hodge, 2003). Harrah's continues integrating data across properties, developing models, mining the data, and running marketing and service delivery programs and propels it to be the leading position within gaming industry (Bligh & Turk, 2004).

Web-Enabled Customer Relationship Management

Swift (2001, p. 12) defined customer relationship management (CRM) as "enterprise approach to understanding and influencing customer behavior through meaningful communications in order to improve customer acquisition, customer retention, customer loyalty, and customer profitability." CRM evolves from direct sales to mass marketing, target marketing and then to customer relationship marketing with an emphasis that marketing and CRM are inseparable (Ling & Yen, 2001). CRM is used to identify individual preferences, demographics, psychographic profiles and other measures to predict future behaviors and customize marketing efforts (Hendler & Hendler, 2004). In addition, CRM often identifies valued customers who repeatedly purchase a great deal of hotel and restaurant services (Min, Min & Emam, 2002).

It is clear that data mining plays a critical role in CRM systems and helps transform customer data into useful information and knowledge (Ngai, 2005). For

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