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An untapped gold mine? Exploring the potential of market basket analysis to grow hotel revenue

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ABSTRACT

Market Basket Analysis identifies and predicts the purchasing behavior of customers based on the expenditure patterns of all previous customers. While widely applied in retail contexts, its use in hospitality is limited. This paper argues that Market Basket Analysis could increase revenue by enabling hotels to determine the most attractive additional products and services (beyond the room type) to offer new and repeat hotel guests. The method's potential is illustrated using five years of internal guest sales records from a luxury hotel group in Australia. Findings point to significant opportunities for hotel operators to use existing stored data to better understand purchasing decision patterns that can significantly increase revenue per transaction. Challenges to adoption and future research suggestions are offered.

1. Introduction

One of the great challenges for hotel companies, and more broadly for any tourism or hospitality business, is maximizing revenue. There are many revenue lines on a typical hotel profit and loss statement. Depending on the type of hotel and level of service, typical purchase options available to a customer include type of room (King, Queen, Suite), upgrades to a room with a view, bed and pillow types, parking (valet or self-service), room service, rate with breakfast included, dining in a food service outlet (restaurant, café, pool bar), internet/wifi access, mini bar, laundry, ironing, arranged tours, access to rental cars, and many others. Despite the many revenue options at a typical hotel, the ever-increasing availability of information technology, and the large number of transactions that could potentially be analyzed, many hotels fail to capitalize on data mining techniques that could identify purchase patterns and provide insights into ways to increase revenue.

The development of techniques to understand customer purchasing patterns is important for the hotel industry, which globally generates over half a trillion US dollars per year in revenue (Statista Statistics Portal, 2015). At any level, revenue growth and profitability are invariably top of mind issues. Indeed, a random review of any hotel sector print or web-based trade publication (e.g., Hotel News Now, Hotel Business News, Lodging Management and many others) offers countless examples of how hotel companies aim to maximize revenue, profitability and efficiency. At a recent panel discussion with industry leaders and deans of some of the world's leading hotel schools (Withiam, 2012), revenue growth and the utilization of existing technology to enhance hotel efficiencies was identified as vital to the future of the hotel sector. The panel highlighted many of the challenges facing the hotel sector, including the importance of identifying new sources of revenue to help combat increases in costs and competition. It was agreed that hotels have not only failed to fully capitalize on using technology to assist with strategic pricing decisions, but that they have also underused technology to identify additional revenue growth opportunities beyond the current focus on room rates and yield. These concerns have been echoed by others (e.g., Butscher et al., 2009), as rising costs, increased competition and economic ebbs and flows put pressure on hoteliers to identify means and ways to maximize customer expenditures across all hotel revenue areas.

A common approach used in the hotel sector to increase revenue efficiency is yield or revenue management. Revenue management is a process aimed at maximizing revenue and ultimately profit through increased sales and effective control of price, inventory and customer mix (Wang, 2012). It was originally developed to help the US airline industry following deregulation in the 1970s

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and has since been adopted in many service sectors where there are supply-demand-capacity constraints (Anderson and Xie, 2010), such as rental cars, cinemas, restaurants and even at retailers like IKEA who offer lower prices on quieter days in order to increase demand (Edvardsson and Enquist, 2008).

From a broader service industry perspective, businesses have long realized that adding services (Vandermerwe and Rada, 1988) and finding ways to enhance customers' experiences through service and customization are important aspirations and drivers of performance (Ostrom et al., 2010). In the service management and marketing literature there is growing interest in customer perceived value as an important antecedent to satisfaction, loyalty and 'word of mouth' marketing behaviors (Gronroos, 1997; Kumar et al., 2006; Yee et al., 2011). One way service organizations build customer loyalty is by developing integrated, data-driven revenue management approaches that help customer make purchasing choices based on their preferences and past behaviors (Anderson and Xie, 2010). So while revenue management can be viewed from a firm perspective – raising revenues – it can also be seen as a customer-centric strategy because it improves customer experiences. Suggesting that revenue management processes aligns with a service and customer relationship perspective is not without its detractors. Wang (2012) argues that there are conflicting priorities in hotel organizations between shorter term financial goals (such as revenue increases) and long term customer value and customer relationship management and calls for further research examining potential management conflicts that occur due to the incompatibility between customer relationship management and revenue management practices. Similarly, in a study on the implementation of revenue management in a budget hotel context, El Haddad (2015) found that for revenue management systems to work effectively in the long term, more consideration of customer outcomes must be taken.

In addition to using data to improve customer purchasing choice, hotel owners are continually seeking innovative ways to gain competitive advantage and economic success (Nieves and Segarra-Ciprés, 2015). Such innovations include the generation or adoption of new management processes, structures or techniques that affect performance, productivity and competitiveness. Firms able to make fundamental changes to traditional processes – management innovation – are often able to gain competitive advantage (Volberda et al., 2013; Wernerfelt, 1995). Utilizing existing data and technology with new analytical techniques to enhance revenue and improve the customer experience is one such innovation.

The purpose of this paper is to describe Market Basket Analysis and highlight its potential to augment revenue management by not only increasing revenue, but also enhancing the customer experience. This in turn increases customer loyalty and satisfaction. The Market Basket approach is distinctly different from loyalty programs because it allows managers to make an informed judgment about what set of hotel services should be offered to a guest whose past behavior is not known by the hotel. These decisions are based on the service consumption patterns of similar guests who have visited the hotel before.

This paper has four aims. First, it will introduce Market Basket Analysis to hospitality researchers and practitioners and illustrate its usefulness by showing, 'even with the most basic internal hotel data, how it can identify guests' dominant patterns of hotel expenditure. Second, to determine whether expenditures for hotel rooms, sundry items, and food and beverages in the hotel are linked to each other or made independently. Third, to explore if there are differences in price sensitivity across expenditure types, and lastly to discuss benefits and challenges of practical application in industry.

2. Literature review

2.1. Revenue management

The practice of revenue management in the hotel industry has grown significantly in the past three decades, and is now considered an indispensable part of hotels' marketing and operating strategies (Koupriouchina et al., 2014). Hotel revenue management policies have been developed with the aim of profitably matching or managing fluctuating demand of a hotel's constrained and perishable capacity. This is achieved by employing a range of room pricing and allocation tools; addressing core revenue management concepts such as the reservation of a portion of the capacity for higher value customers at a later date; efficient price discrimination practices to extract as much of the consumer surplus as possible; overbooking policies to offset no shows; late cancelations; and early departures (Upchurch et al., 2002). A number of factors have been proposed as essential to success of any revenue management program, including the ability to track and segment the market by consumption characteristics, forecasting patterns, accuracy of historical usage information, accuracy and timeliness of updates on inventory, and management's ability to monitor consumption and patterns (Griffin, 1996; Upchurch et al., 2002).

At its core, revenue management is a profit maximization technique aimed to increase yield through predictions of available room allocations based on sets of criteria that are analyzed before setting a price. This price is set at the highest it can be without losing the business (Emeksiz et al., 2006). Revenue management aims to increase revenue per transaction through systematic and continuous manipulation of rates in response to forecasted patterns of demand, with the main goal being to maximize yield and achieve as close to maximum revenue as possible. This quest to maximize yield and the early usage of revenue management in a hotel context is said to have led to the creation of many common hotel financial terminologies, for example 'revenue per available room' (otherwise known as RevPAR) (Anderson and Xie, 2010).

Although there is conflicting evidence about the precise financial benefits of revenue management systems (Queenan et al., 2011), its use has become standard practice in the hotel sector. Many reasons are provided for this proliferation, including ever more powerful information technology (including faster and larger databases) and the amount of guest details collected and stored (Mei and Zhan, 2013) as well as continued pressure from owners and management companies to drive efficiencies and returns on investment (Turner and Guilding, 2013).

The importance of revenue management and other actions designed to maximize revenue streams is demonstrated by the manner in which this function is operationalized in the hotel sector. Initially, the revenue management function was typically managed by a committee consisting of the general manager, front office manager, marketing manager, reservations manager and hotel controller. However the growing importance of revenue management has led to the emergence of a new and high demand position in hotels, the revenue manager (Ferguson and Smith, 2014). Given their importance to organizational success, researchers are now studying the role of revenue managers more closely. Some argue the importance of the human aspects to revenue management, highlighting the central role that revenue managers play not only as data analysts and decision makers, but also as information brokers who enhance group decision making in hotel organizations (Aubke et al., 2014)

Despite revenue management being praised as providing significant increases in hotel revenues, there are many calls for the development of new ways of using customer information to maximize revenues (Gayar et al., 2011). In a study exploring the future of hotel revenue management (Kimes, 2010), the most common