Chapter 12
Understanding Shopping Behaviors With Category- and Brand-Level Market Basket Analysis

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ABSTRACT

In a digital transformation environment, most businesses shift towards e-business and encounter businesses and customer interaction on digital channels. Information Technology renders data access and processing more efficient, and use of customer data in decision making has become a focal interest area that attracts researchers. Customer data is a relevant subject for numerous studies in Data Mining. In this chapter, Association Rule Mining has been utilized to extract purchase behavior patterns with a multilevel approach. Basket data obtained from an online retailer was analyzed to discover purchase behaviors with a focus on category and brand attributes of products. Brands and categories purchased together frequently were discovered. Brand and category-wise association rules were also presented in the results. The analysis differs from the majority of prior analyses, by referring to the category and brand attributes in basket data. It could be noted that generalized rules obtained with this approach might prove useful in recommending new items of existing brands or categories.

INTRODUCTION

Information Technology is a crucial driver of radical transformation in various industries. Over the last decades, the businesses have put substantial effort to adapt to an inevitable wave of digitalization. Moreover, the emergence of electronic trade stresses the game-changing nature of digitalization for businesses. Such transformation has introduced customer data as an enormous resource. Especially in a

global market that turns out as a compelling environment for businesses, the utilization of digital assets is a vital requirement for business management.

The Internet had a game-changing role over the competition as well. The introduction of e-commerce had quickly pushed businesses to extend to the global market. The decline in transportation costs has been one of the most critical factors that increased global trade over the last five decades (Hummels, 2007). It might be noted that the progress in global trade, the prevalence of e-commerce and Internet technologies have also created various opportunities for businesses. For instance, businesses have the opportunity to reach out to more distant markets and connect to a higher number of customers around the globe. In this context, it could also be argued that the significant role of Information Technology in the rise of an integrated global market is worth emphasis. Such developments offer global opportunities for both individuals and small businesses with electronic commerce. A customer has the opportunity to search a particular product from numerous rivals in the global market, explore various alternatives, evaluate corresponding transportation costs and arrival options, and pick a product for purchase among various options by many competitors.

For businesses, the global market powered by electronic commerce has a specific challenge of anonymity. A local dealer might easily get acquainted with hundreds of citizens over time. Such acquaintance then enables a more detailed and individually developing conversation with customers. Moreover, customer response can be captured unconsciously. In contrast, electronic commerce is far from offering such personal contact. For instance, an online visitor who has not performed a login becomes anonymous. Technically, such a visitor is hiding his or her personal identity from the owner of the website. Moreover, the interaction established with the customer involves actions limited to mouse clicks, gestures, and some text entered over search forms. Far from a regular encounter with a personal conversation, it might be reasonable to mention the challenge of understanding an online customer. For salespeople or practitioners, scarceness of behavioral patterns might constitute a troublesome endeavor in an online setting.

Fuciu and Dumitrescu (2015) underlined the ever-changing nature of the marketing discipline and argued that there is a shift of focus on customer behavior and social media in marketing. In particular, customer data can be highlighted as an important asset that has been a focus of interest with the prevalence of digitalization in marketing. Besides, it can be argued that a customer-focused approach had become prevalent in marketing researchers and practitioners, especially since the introduction of Customer Relations Management (CRM). Within this context, Payne and Frow (2005) identified the role of customer data in CRM; and emphasized the importance of collection and utilization of customer data to enhance customer experience and endure the existing relationships with customers.

In their book published recently, namely 'Marketing 4.0', Kotler et al. (2017) have mentioned the importance of capturing customer data for marketers regarding various decisions in tactical level; including layout selection, promotion launching, customer purchase prediction, and fixing real-time offerings online. Likewise, Saarijärvi et al. (2013) explored the role of customer data in customer-business interaction; and has come up with a notion of shared customer data that emphasizes the social connections among customers.

In order to create value from data, quantitative models are employed to reach out to useful conclusions. Concerning the high volume of customer data in a typical e-business, analyses without the utilization of proper techniques might lead to information overload. Eppler and Mengis (2004) provided an overview of prior research on information overload problem and addressed its consequences in decision-making. The authors noted that the problem decreases decision quality and effectiveness, and argued that Management Information Systems (MIS) studies have the advantage to provide solutions concerning its

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