



Business intelligence in online customer textual reviews: Understanding consumer perceptions and influential factors



Xun Xu^a, Xuequn Wang^{b,*}, Yibai Li^c, Mohammad Haghighi^d

^a Department of Management, Operations, and Marketing, College of Business Administration, California State University, Stanislaus, One University Circle, Turlock, CA, 95382, United States

^b School of Engineering and Information Technology, Murdoch University, 90 South Street, Perth, WA, 6150, Australia

^c Operations & Information Management Department, Kania School of Management, The University of Scranton, Brennan Hall 322, Scranton, PA, 18510, United States

^d Faculty of Management, University of Tehran, Tehran, Iran

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ABSTRACT

With the rapid development of information technology, customers not only shop online—they also post reviews on social media. This user-generated content (UGC) can be useful to understand customers' shopping experiences and influence future customers' purchase intentions. Therefore, business intelligence and analytics are increasingly being advocated as a way to analyze customers' UGC in social media and support firms' marketing activities. However, because of its open structure, UGC such as customer reviews can be difficult to analyze, and firms find it challenging to harness UGC. To fill this gap, this study aims to examine customer satisfaction and dissatisfaction toward attributes of hotel products and services based on online customer textual reviews. Using a text mining approach, latent semantic analysis (LSA), we identify the key attributes driving customer satisfaction and dissatisfaction toward hotel products and service attributes. Additionally, using a regression approach, we examine the effects of travel purposes, hotel types, star level, and editor recommendations on customers' perceptions of attributes of hotel products and services. This study bridges customer online textual reviews with customers' perceptions to help business managers better understand customers' needs through UGC.

1. Introduction

With the rapid development of information technology, customers not only shop online—they also post reviews on social media. This information created based on social media platforms is often referred to as user-generated content (UGC). UGC can help reduce the perceived risk of online shopping before customers make purchasing decisions (Ladhari & Michaud, 2015). UGC also provides opportunities for firms to receive customer feedback and improve corresponding attributes of products and services, generating critical business value (Habibi, Laroche, & Richard, 2014; Suo, Sun, Hajli, & Love, 2015; Wang, Hsiao, Yang, & Hajli, 2016; Xie, Zhang, & Zhang, 2014). Therefore, business intelligence and analytics (BI & A) is increasingly advocated to analyze UGC and support firms' marketing activities.

BI & A has become increasingly important for firms' profit and operations. Using effective BI & A, firms can reduce their marketing costs by better understanding customer preferences and implementing market segmentation (Wixom & Watson, 2010). It is predicted that, in the United States alone, there will be a shortage of 140,000 to 190,000 professionals with deep analytical skills by 2018 (Manyika et al., 2011).

However, UGC such as online customer textual reviews is often in open form and has no structural restrictions. Therefore, although UGC includes richer information regarding customer purchasing experiences and perceptions (Berezina, Bilgihan, Cobanoglu, & Okumus, 2016) than customer ratings, it is quite challenging for firms to apply BI & A and harness UGC. As a result, the value of UGC is insufficiently discovered and analyzed, and firms find it challenging to generate marketing insights regarding what aspects of products or services make customers feel satisfied or dissatisfied based on UGC.

The numerous customer online reviews posted on social media and online shopping websites have sped up the demand for big data analytics and corresponding techniques. Dealing with unstructured texts is among one of the biggest challenges of big data analytics (Gandomi & Haider, 2015). Sentiment analysis is often used to mine customers' sentiments from their online reviews (Schumaker, Jarmoszko, & Labedz, 2016). Sentiment analysis can detect the implicit expressions of customers' emotions in their texts (Balahur, Hermida, & Montoyo, 2012). To further examine customer online reviews, our study focuses on examining customer satisfaction and dissatisfaction.

* Corresponding author.

E-mail addresses: xxu@csustan.edu (X. Xu), xuequnwang1600@gmail.com (X. Wang), yibai.li@scranton.edu (Y. Li), mhaghighi@ut.ac.ir (M. Haghighi).

Although customer satisfaction and dissatisfaction have been well examined in previous literature, few studies have discussed customer satisfaction and dissatisfaction using customers' online textual reviews (Xiang, Schwartz, Gerdes, & Uysal, 2015). In these few studies, descriptive methods such as frequency analysis and content analysis are most often used (e.g., Li, Ye, & Law, 2013). Therefore, more studies are needed to explore how to better utilize UGC to capture customers' insights and bridge the gap between customer satisfaction/dissatisfaction and UGC.

With the hospitality industry as its context, the objective of this study is to analyze UGC to identify key attributes driving customer satisfaction and dissatisfaction toward hotel products and service attributes and to examine the effect of travel purposes, hotels types, star level, and editor recommendations on customers' perceptions of attributes of hotel products and services offered by hotels with different types. This study has two research questions. First, *what are the key attributes driving customer satisfaction and dissatisfaction, which are reflected in customer reviews posted on online booking websites (booking.com in this study), toward hotel products and service attributes?* To answer this question, our study conducts latent semantic analysis (LSA), a text mining approach, to analyze online customer textual reviews from booking.com. We selected LSA because this technique is helpful in extracting and representing human nature words (Kulkarni, Apte, & Evangelopoulos, 2014). We consider positive online reviews to indicate customer satisfaction and negative online reviews to indicate customer dissatisfaction. Thus, the attributes driving customer satisfaction are mined from positive reviews, and the attributes driving customer dissatisfaction are mined from negative reviews. Second, *what are the effects of travel purposes, hotels types, star level, and editor recommendation on customers' perceptions of attributes of hotel products and services?* To answer this question, our study conducts regression based on textual reviews.

Our study makes important contributions that benefit both researchers and business practitioners. Academically, our study bridges customer satisfaction and dissatisfaction with online customer textual reviews by reflecting customers' perceptions of attributes of products and services. To process the textual data, our study combines text mining and regression methods to extract and represent customer consumption experiences and perceptions. Our study thus contributes to previous BI & A literature by proposing a new approach to capture consumer perceptions. Previous studies mainly used customer ratings to examine their satisfaction with preset questions reflecting certain attributes of products and services (e.g., Schuckert, Liu, & Law, 2015). By using LSA and regression based on customer textual reviews, our study can thoroughly examine customer perceptions of attributes of products and services through detailed consumption experiences. In this way, firms can practically identify relevant product and services attributes leading to customer satisfaction and dissatisfaction as well as how customers' perceptions of those attributes are influenced by firms' market positioning and strategies. Those results can thus provide these firms with a roadmap for improving service quality and firm performance and for better targeting the market by implementing appropriate market positioning and strategies.

The rest of our study is structured as follows. Section 2 reviews the relevant literature; Section 3 discusses the theoretical background and develops the hypotheses; Section 4 describes the research method; Section 5 analyzes the data and presents the results; Section 6 discusses the results; Section 7 provides implications, limitations, and opportunities for future studies; and Section 8 concludes the study.

2. Literature review

2.1. Business intelligence and analytics

BI & A is referred to as “the techniques, technologies, systems, practices, methodologies, and applications that analyze critical business

data to help an enterprise better understand its business and market and make timely business decisions” (Chen, Chiang, & Storey, 2012). BI & A was initially used to focus on structured data stored in commercial relational database management systems. Since the 2000s, Web 2.0-based systems such as social media have generated a large amount of unstructured UGC, resulting in great opportunities and challenges for BI & A.

Recent BI & A literature has begun to understand how to better analyze and harness UGC on social media. For example, Chau and Xu (2012) developed a framework to automatically collect and analyze blog content. Park, Huh, Oh, and Han (2012) proposed a social-network-driven inference framework to determine the accuracy and reliability of customer profiles. He, Zha, and Li (2013) applied text mining to analyze text content on the Facebook and Twitter sites of the pizza chains. More recently, Wang et al. (in press) conducted a content analysis of 26 big data implementation cases in health care and identified five major big data analytics capabilities and potential benefits. Those studies made important progress regarding to how to analyze and harness data on social media.

However, conducting BI & A is still challenging because of the lack of widely adopted methods for effectively analyzing and harnessing data on social media. The value of social media data has thus been insufficiently explored to support marketing activities. Therefore, more BI & A studies are needed to examine how to analyze social media data and capture consumer perception of UGC, as well as understand how BI & A can help create business value. Our study tries to fill this gap by using text mining to analyze social media data. With LSA and regression, our method can bridge customers' online textual reviews and customer perceptions and generate important marketing insights for business practitioners. Our study particularly focuses on customer satisfaction and dissatisfaction toward particular attributes of products and services.

2.2. Customer satisfaction and dissatisfaction

Although customer satisfaction and dissatisfaction have been widely examined in previous hospitality literature (e.g., Gu & Ye, 2014; Matzler & Sauerwein, 2002; Sim, Mak, & Jones, 2006), few studies treat them separately (Zhou, Ye, Pearce, & Wu, 2014), despite the fact that customer satisfaction and dissatisfaction are different constructs (Chowdhary & Prakash, 2005). Specifically, most studies use the overall satisfaction score to measure customer satisfaction and do not differentiate low satisfaction from dissatisfaction. Indeed, according to the two-factor theory (Matzler & Sauerwein, 2002), customer satisfaction and dissatisfaction can coexist. Some factors, such as excitement factors, can generate customer satisfaction at a high level but do not result in customer dissatisfaction at a low level. Other factors, such as basic factors, can generate customer dissatisfaction at a low level but may not result in customer satisfaction at a high level. To better illustrate the different formation mechanisms of customer satisfaction and dissatisfaction, our study views customer satisfaction and dissatisfaction separately and identifies their corresponding influential factors.

In terms of methodologies, most previous studies use surveys to examine customer satisfaction and dissatisfaction. Although surveys can obtain first-hand data, they may not allow researchers to identify all of the product and service attributes that affect customer satisfaction and dissatisfaction. To avoid the limitations of the survey method, our study uses customer online textual reviews, a specific type of UGC, to examine customer satisfaction and dissatisfaction, which have received little attention in previous literature (Xiang et al., 2015; Berezina et al., 2016). Online textual reviews reflect customer satisfaction and dissatisfaction in a more inclusive and comprehensive way because of their open structure, the availability of big data samples, and the anonymity of respondents. Therefore, our study can complement previous literature by examining customer satisfaction and dissatisfaction toward attributes of products and services with online customer textual reviews.

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