



Predicting hotel review helpfulness: The impact of review visibility, and interaction between hotel stars and review ratings



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ABSTRACT

The tourism industry has been strongly influenced by electronic word-of-mouth (eWOM) in recent years. Currently, there are only limited studies available that look into hotel review helpfulness. This present study addresses three hidden assumptions prevalent in online review studies: (1) all reviews are visible equally to online users, (2) review rating (RR) and hotel star class (HSC) affect review helpfulness individually with no interaction, and (3) characteristics of reviews and reviewer status stay constant.

Four categories of input variables were considered in the present study: review content, sentiment, author, and visibility. Our findings confirmed the interaction effect between HSC and RR. The data set was sub-divided into eight subsets as a result. Three review visibility indicators (including days since a review was posted, days since a review has remained on the home page, and number of reviews with the same rating at the time a review was written) had a varying and strong effect on review helpfulness. The model performance was greatly improved after taking account of review visibility features, the interaction effect of HSC and RR, and a more accurate measurement of variables. Model tree (M5P) outperformed linear regression and support vector regression as it better modeled the interaction effect.

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1. Introduction

The advent of Web 2.0 technology brought about a new way of sharing personal knowledge, opinion and experience online. User-generated content (UGC) is now an increasingly useful resource for many on the Internet (Harrison-Walker, 2001; Yoon & Uysal, 2005). When UGC is made public on the Internet, its effect as an electronic form of word-of-mouth is of much business value. According to Litvin, Goldsmith, and Pan (2008, p. 461), the electronic word-of-mouth (eWOM) is defined as “all informal communications directed at consumers through Internet-based technology related to the usage or characteristics of particular goods and services, or their sellers.” Nowadays, different types of eWOM such as online reviews, opinions and recommendations, have been recognized as the most influential channel of communication between service providers and consumers as well as among consumers themselves (Cantallops & Salvi, 2014; Cheung & Lee, 2012; Ghose & Ipeirotis, 2011).

Previous studies have shown that the tourism industry is strongly influenced by online social media and eWOM (Arsal, Woosnam, Baldwin, & Backman, 2009; Lee, Law, & Murphy, 2011; Ong, 2012; Yacouel & Fleischer, 2012). According to the report by Skift.com, online reviews ranked among the top-three most important factors in travel booking. About 89% of global travelers and 64% of global hoteliers believe that online hotel reviews are influential to hotel reservations (O'Brien & Ali, 2014). The survey conducted by Ady, TrustYou, and Quadri-Felitti (2015) revealed that nearly 95% of travelers read online hotel reviews before making their booking decisions, and more than one third of travelers believed that online reviews was one of the most critical factors for their decisions on hotel selection.

As more and more travelers are willing to share their travel experience on travel websites, a large quantity of hotel reviews are generated daily. These online reviews have become the leading resource for prospective travelers (Chaves, Gomes, & Pedron, 2012; Serra Cantallops, & Salvi, 2014). It is, however, a daunting task to wade through the sheer amount of reviews in a reasonable amount of time. To address this problem, travel opinion websites have commonly used the “helpfulness” of a review (i.e., the number of votes on helpfulness of a review) as one key indicator to help users evaluate the quality of a review (Cao, Duan, & Gan, 2011;

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Ghose & Ipeirotis, 2007; Mudambi & Schuff, 2010; Ngo-Ye & Sinha, 2014). Review helpfulness is frequently measured by the number of votes received from readers finding the review to be helpful.

Opening helpfulness votes on a hotel review addresses the common difficulty of locating useful reviews, but it offers very limited guidance for review writers to compose quality reviews. A long review does not always win the helpfulness vote. Quality reviews are highly desirable for business owners as they provide a fairer assessment on their products. High quality reviews are also welcomed by review sites as they drive traffic and eventually profitability. Therefore, a study on the defining characteristics of helpful reviews will offer useful insights.

As of this writing, most review helpfulness studies concern primarily physical goods (e.g., books and products). Although this line of research is useful in the context where they were intended, hotel reviews are not exactly the same as physical product reviews (Dong, Schaal, O'Mahony, & Smyth, 2013; Forman, Ghose, & Wiesenfeld, 2008; Ghose & Ipeirotis, 2011; Kim, Pantel, Chklovski, & Pennacchiotti, 2006; Korfiatis, García-Bariocanal, & Sánchez-Alonso, 2012; Liu, Cao, Lin, Huang, & Zhou, 2007; Otterbacher, 2009). Generally hotels are in the service business and the perceived quality of hotel service is often intangible and subjective that cannot be easily measured by looking at promotional materials alone (Lu, Ye, & Law, 2014). This type of products is called experience goods defined by Mudambi and Schuff (2010) as "one in which it is relatively difficult and costly to obtain information on product quality prior to interaction with the product; key attributes are subjective or difficult to compare, and there is a need to use one's senses to evaluate quality." (p. 187). This is the reason that hotel reviews are not confined in reporting the physical facilities or services within the premise of the hotel. Convenience, location, nearby traffic, behavior of tenants in the next room, etc. have all entered in hotel reviews in the past. As a result, this makes hotel reviews a form of UGC that are richer and more dynamic than physical product reviews. Therefore, one should exercise care when generalizing findings from product review studies into hotel reviews. This is also supported in Mudambi & Schuff's work where experience goods and search goods differ in review rating, word count, helpfulness vote and helpfulness percentage.

Currently, there are only a handful of studies that start to shed some light on hotel review helpfulness (O'Mahony & Smyth, 2010; Zhu, Yin, & He, 2014). Upon reviewing both product review and hotel review literatures, several issues seem to affect the accuracy of existing findings if not carefully taken care of. Details of these issues are outlined in the next section.

2. Current issues

In today's competitive environment, switch cost is very low online for a customer to switch to a competitor's offering. It is beneficial for travel websites to engage visitors longer on the site. One way to accomplish this is to offer a robust review filtering system that recommends quality reviews based on past proven characteristics of helpfulness votes. Once these key characteristics are identified, business value-add activities may be devised accordingly. For example, a travel website will be able to engage in predictive analytics to identify the reviews that could potentially win readers' votes and then advertise alongside these reviews accordingly. Additionally, these characteristics could be part of the quality guidelines for review writers.

There are only very limited studies available that look into helpfulness of hotel reviews (such as Hwang, Lai, Chang, & Jiang, 2014; O'Mahony & Smyth, 2010; Zhu et al., 2014). In these studies, content of a review, sentiment, and review author features are among the factors used to study the straight relationship with the response

variable – usually review helpfulness. Although these studies provide some initial insights into the complex relationship among these variables, there are implicit assumptions that could hamper the accuracy of the models. First, all reviews are assumed to be visible to viewers equally. Second, predictor variables are assumed to hold a constant effect on the response variable independent of other predictors. The following sub-sections detail thoughts on these assumptions.

2.1. Unequal opportunity of review visibility

In the online review literature, number of days since a review is posted (a.k.a., review elapsed days) has received much attention in predicting review helpfulness. In real life, the visibility of two reviews is likely to vary depending on how long they stay on the main page of travel web sites. This is because most web sites present reviews in "pages", where a handful of reviews are displayed on one page at a time. As new reviews are posted, older reviews are pushed to the back pages. If two reviews are not equally visible to the readers (e.g., one on the main page, and the other one on a back page), the influence of their content, sentiment, author's background, etc. should not be treated equally. The longer a review stays on the main page, the more likely it is viewed and voted on. In the end, the reviews that rated the same hotel with exactly the same rating may not receive an equal opportunity to be viewed by the viewers. As a result, the opportunity for receiving review helpfulness varies between the two.

In addition, most hotels have a skewed distribution on their review rating. For example, Bellagio hotel in Las Vegas has received nearly fifteen thousand reviews as of this writing; over 87% of reviews rated it as "Excellent" or "Good" and only 4.2% of reviews rated it as "Poor" and "Terrible". If a review rates the hotel as "Excellent", it could well be buried in so many reviews with the same rating and thus has lower probability to be viewed and voted on. In the end, the reviews that rated the same hotel with exactly the same rating may not receive an equal opportunity to be viewed by the viewers.

Based on the above assessment, it is useful to delve into review visibility by studying the effect of days of a review on the home page and number of reviews with the same review rating in addition to review elapsed days. To the best of our knowledge, these three types of review visibility have not received much attention in the literature.

2.2. Interaction among variables

One other assumption not yet explored in existing studies is that predictor variables are assumed to have no interaction with each other. This may not be true as some predictors are likely to have an interaction effect. For example, Hotel star class (HSC) and review rating (RR) are among the key variables that relate to review helpfulness (O'Mahony & Smyth, 2010; Zhu et al., 2014). HSC is a well-recognized international scheme that represents the quality of a hotel as number of stars, while RR reflects a reviewer's perception of hotel quality. Intuitively, the two may be considered to correlate positively. It is not necessarily the case. When a review rating does not match the hotel star class (i.e., a high-class hotel with low review rating or a low-class hotel with high review rating), it usually attracts attention and therefore increases the chance of the review being read. As a result, the likelihood of these reviews receiving a helpful vote may not be the same as those conformant reviews (high RR for high HSC or low RR for low HSC). The interaction effect of RR and HSC on review helpfulness seems highly likely, but the literature lacks an answer to it.

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