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Understanding customers' hotel revisiting behaviour: a sentiment analysis of online feedback reviews

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ABSTRACT

Customer retention has been one of the most recognized research issues in the service industry. The next on the list is predicting customer behaviour or understanding customer intent, which is particularly important for the hospitality and tourism industries. This study investigates the customers' hotel revisiting behaviour using a large-scale customer review data, which can shed light on the potentiality of (i) identifying the factors that are associated with the customer revisiting behaviour and attracting more customers to reuse their services and (ii) predicting future customer revisiting behaviour to a hotel. We analyse the data of 105,126 customers of an online hotel reservation service, and conduct a sentimental analysis on the user feedback reviews. By comparing one-time visitors and re-visitors, our analysis shows that the feedback reviews of re-visitors tend to (i) contain more words in a sentence and (ii) reveal more positive/negative sentiments than those of one-time visitors. On the other hand, the feedback reviews of one-time visitors tended to include more analytical and anxious words than those of re-visitors. The findings can serve as a foundation for the use of big data analysis in hospitality and tourism research.

1. Introduction

Because of the rapidly expanding the power of the digital world and the Internet, people worldwide can easily obtain various services across networks. This allows users to consult service reservations and/or directly interact with service providers. Especially, recent advances in online and mobile technologies have significantly expanded industries. For example, in the hotel industry, online and mobile services provide hotel information and reservation functions, so that customers can easily make a hotel reservation at anytime and from anywhere. Thus, theoretical investigations on online and mobile commercial services have been conducted from a psychological motivation perspective, including the theory of planned behaviour (Pavlou & Fygenson, 2006), the technology acceptance model (Wu & Wang, 2005), and the theory of motivation (Xiao & Xinyuan, 2010).

Service reuse is one of the most important determinants of the success of such industry. In the field of tourism, in particular, understanding and predicting the customer's intention of revisiting and reusing services is one of the most attentive issues. A customer in tourism can be generally categorized into a first-time visitor or re-visitor. In general, it has been known that a first-time visitor's intention of revisiting a specific destination can be mainly affected by the tour quality and/or satisfaction (Oppermann, 2000; Woodside & Lysonski, 1989). It has been also reported that, among the

many determinants of user intention, prior visits were among the most significant motivators for revisiting (Court & Lupton, 1997). Kozak (2001) revealed a significant connection between users' prior visits and their intentions of choosing the same service next. Bigne, Sanchez, and Sanchez (2001) found that customers' intentions of revisiting a specific region could be explained with a satisfaction and experience model. Raza, Siddiquei, Awan, and Bukhari (2012) argued that customers, who enjoyed a great feeling of perceived value and satisfaction about the symbolic and functional perspectives of a specific hotel, were most willing to revisit the hotel.

Hence, understanding and analysing customers' experience and satisfaction are important for service providers to attract customers' next revisits or provide better services. Such customers' experience and satisfaction can be captured in online reviews (Xiang, Schwartz, Gerdes, & Uysal, 2015). Since online reviews may often reveal valuable information about a hotel, it has been reported that online reviews play a substantial role that attracts customers to visit the hotel (Cantallops & Salvi, 2014; Mauri & Minazzi, 2013; Sparks & Browning, 2011). However, relatively little attention has been paid to whether the customers' revisiting intentions to a hotel can be captured in their feedback reviews. Such research can provide insights for service providers who want to identify the factors that are associated with the customer revisiting behaviour and attract more customers to reuse their services. In addition, extracting revealed intentions from online reviews can provide clues for predicting future customer revisiting behaviour to a hotel, which has implication on customer satisfaction, e.g., via targeted marketing, the improvement of service quality, etc. Thus, the current study attempts to answer the following research question.

- RQ: Do re-visitors reveal intentions of revisiting a hotel in their feedback reviews left on the online reservation service platforms?

1.1. Antecedents of customers' revisit intentions

Most prior studies on customer revisiting behaviour have focused on understanding factors that may be associated with the customers' revisit intentions. Generally, they analysed customers' evaluations that may link to revisiting, using traditional statistical approaches, because of the limited number of samples or respondents. Table 1 shows a summary of several prior studies that explored customers' intentions of revisiting.

Table 1. Summary of previous studies on customers' revisit intentions.

Year	Model & data	Contributing factors	Target
2006	Structural equation modelling method (SEM) with 2115 tourists (Um, Chon, & Ro, 2006)	Perceived attractiveness, and satisfaction	Travel destination
2013	Regression analysis with 586 tourists (Chou, 2017)	Perceived satisfaction	Markets for tourists
2010	SEM with 469 responses (Han & Kim, 2010)	Overall image, subjective norm, attitude, frequency of past behaviour, satisfaction, perceived behavioural control	Green hotel
2016	SEM with 484 responses (Liu & Lee, 2016)	Price perception, word-of-mouth	Low-cost airline service
2009	SEM with 401 responses (Han, Back, & Barrett, 2009)	Customer satisfaction	Restaurant
2015	SEM with 795 responses (Hallmann, Zehrer, & Müller, 2015)	Perceived image	Winter sports destination
2009	SEM with 501 responses (Huang & Hsu, 2009)	Prior visitation, perceived satisfaction	Travel destination
2014	SEM with 268 responses (Pratminingsih, Rudatin, & Rimenta, 2014)	Destination image, satisfaction	Travel destination
2013	SEM with 317 samples (Phillips, Wolfe, Hodur, & Leistritz, 2013)	Destination image	Travel destination
2015	Regression analysis with 10,136 online reviews (Yan, Wang, & Chau, 2015)	Food quality, price and value concept, service quality, atmosphere	Restaurant

On the other hand, the current study attempts to reveal possible customers' intentions of revisiting a hotel using a large-scale dataset collected from an online hotel reservation service. Using this large-scale dataset, our work addresses the limitations of prior studies, such as a small number of samples or biased results, etc.

2. Method

2.1. Data collection

The current study first collected the data of 105,126 customers from an online hotel reservation service. The collected data represents the customer behaviour of booking hotels in Seoul, South Korea, in 2012. After finishing the trips, the customers left review feedback on the reservation site. Later, they revisited Seoul between 2013 and 2016. We checked whether they reserved the same hotel or not. Other visitors, who did not book the same hotel, tended to reserve other hotels located within a 3 km radius of the first visited hotel. We collected the online feedback reviews of the first visited hotel which were written in English. Figure 1 presents two examples of customer feedback reviews shown in the hotel reservation service. Figure 2 shows a summary of the respondents in the collected data.

2.2. Sentiment analysis

This study conducts a sentiment analysis on the customer feedback comment using the linguistic inquiry and word count (LIWC). LIWC is a text mining software that counts words belonging to cognitively and psychologically meaningful categories (Choi et al., 2015; Pennebaker, Mehl, & Niederhoffer, 2003). LIWC computes and presents diverse sentiment scores for a given text, such as positive, negative, or social scores. Each sentiment score is calculated as the relative frequency of words belong to the specific emotional category (eg social, negative, political, positive) out of all the words shown in the given text. Using the LIWC tool, many previous work investigated revealed sentiments, e.g., in online communication (Choi et al., 2015), medical education (Lin, Lin, Wen, & Shao-Yin, 2016), predicting image propagation in social media (Han, Choi, Joo, & Chuah, 2017), or customer reviews in Yelp (Kamerer, 2014). Table 2 summarizes the categories of the sentiments provided by LIWC.

3. Results

A series of one-way analyses of variance is used to detect differences of the sentiment analyses among user groups. Results from the analyses and subsequent *post-hoc* tests find that the words per sentence of the reviews written by re-visitors ($M = 81.20$, SD $= 29.74$) are higher than those
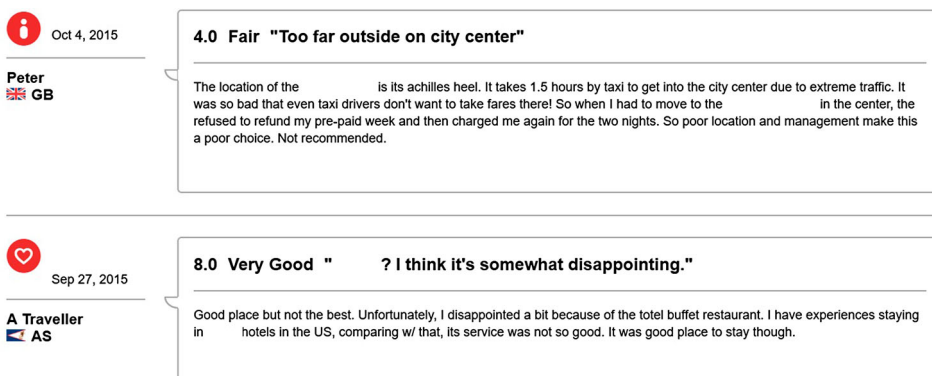

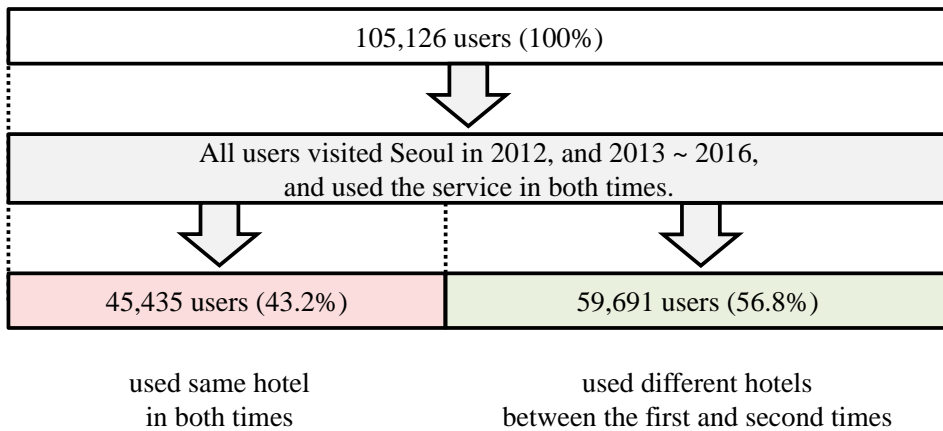**Figure 1.** Two examples of customer feedback reviews in the service site.

Figure 2. A summary of the respondents in the service site.

Table 2. The dimensions and categories of LIWC results.

Dimension	Category
Functional	Pronouns
Grammar	Regular verbs, adjectives, comparatives, interrogatives, numbers, and quantifiers
Biological processes	Body, health/illness, sexuality, and ingesting
Time orientation	Past focus, present focus, and future focus
All punctuation periods	Commas, colons, semicolons, question marks, dashes, quotation marks, apostrophes, parentheses, and other punctuation
Analytic	Analytical thinking
Affect words	Positive emotion, negative emotion – overall, negative emotion – anger, anxiety and sad
Cognitive processes	Insight, cause, discrepancies, tentativeness, and differentiation
Relativity	Motion, space, and time
Personal concerns	Work, leisure, home, money, and death
Social words	Family, friends, female referents, and male referents
Perpetual processes	Seeing, hearing, and feeling
Core drives and needs	Affiliation, achievement, power, reward focus, and risk/prevention focus
Informal speech	Swear words, netspeak, assent, non-fluencies, and fillers

of one-time visitors ($M = 66.79$, SD $= 37.13$), $F(1,105,124) = 4,597.66$, $p<.001$. Additionally, the one-time visitors ($M = 49.15$, SD $= 43.70$) tend to be more analytic than re-visitors ($M = 43.86$, SD $= 37.44$), $F(1,105,124) = 426.38$, $p<.001$ (Figure 3).
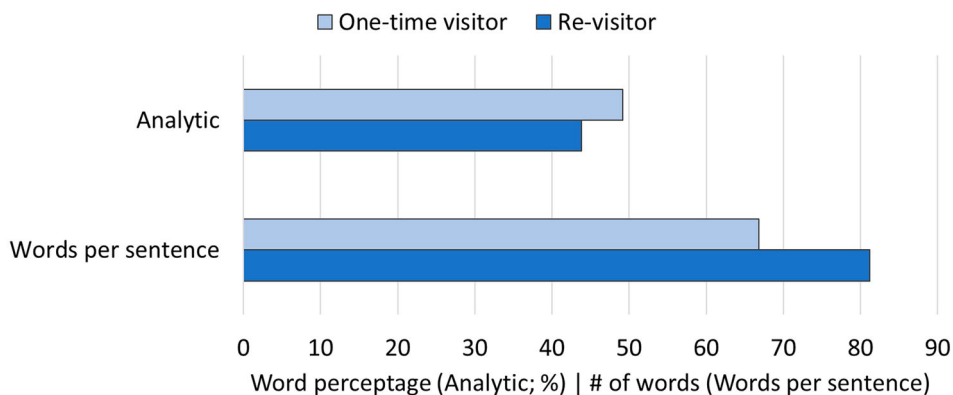

Figure 3. Results of sentiment analysis (words per sentence and analytic aspects).
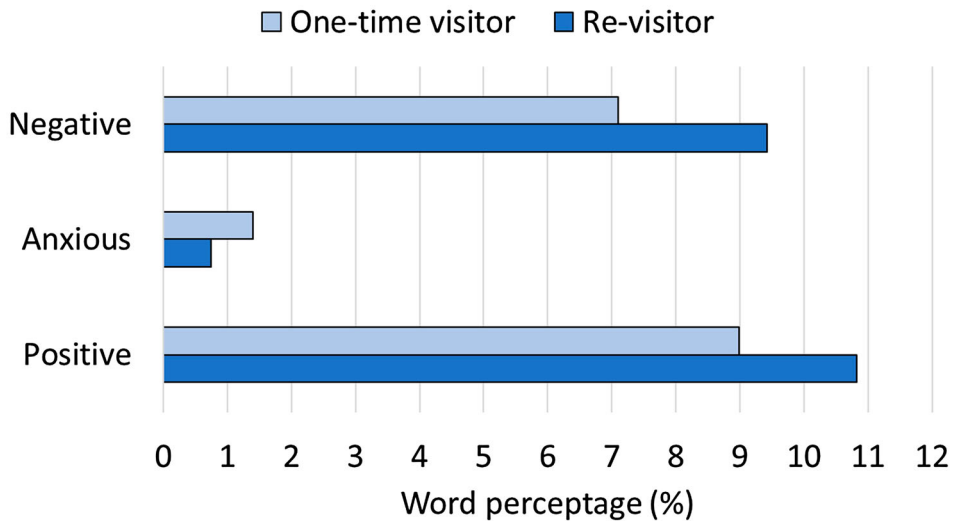
Figure 4. Results of sentiment analysis (positive, anxious, and negative aspects).

Re-visitors' comments ($M = 10.82$, SD $= 11.44$) tend to include more positive words than those of one-time visitors ($M = 8.99$, SD $= 10.50$), $F(1,105,124) = 727.15$, $p<.001$. The comments of one-time visitors ($M = 1.40$, SD $= 3.97$) use more anxious words than those of re-visitors ($M = 0.74$, SD $= 2.37$), $F(1,105,124) = 993.86$, $p < .001$. Lastly, re-visitors ($M = 9.42$, SD $= 11.19$) present more negative comments than one-time visitors ($M = 7.10$, SD $= 10.01$), $F(1,105,124) = 1252.33$, $p < .001$ (Figure 4).

4. Conclusion

Understanding customers' intentions of revisiting a hotel has gained a great attention in the tourism industry. This study revealed that the customers' revisiting intentions to a hotel can be captured in their online feedback reviews, by collecting and analysing the large-scale customer review data. The current study sheds light on the potentiality of (i) identifying the factors that are associated with the customer revisiting behaviour and attracting more customers to reuse their services and (ii) predicting future customer revisiting behaviour to a hotel, providing a huge opportunity to the service and hospitality sciences. The service provider can attempt to attract more customers by addressing the dependable responses, reviews, and perceptions of customers willing to revisit.

The findings of the current study indicate that customers who revisited services showed (i) more words in a review sentence and (ii) more positive and negative emotional statements than one-time visitors. Thus, consistent with the findings of prior studies (Gans, 2011), potential re-visitors tended to state more opinions about the services in the hope that the service providers would address them and improve the services. The responses of the one-time visitors tended to be more analytical and anxious than those of the re-visitors (Liljander & Strandvik, 1997). This indicates that re-visitors were more likely to present more familiar or emotional statements than one-time visitors (Yang, Gu, & Cen, 2011).

This study has several limitations. First, there could be specific reasons that customers did not book their original hotels. For example, some visitors who use other hotels during consecutive visits could have business meetings or workshops within those hotels. Or, the preferred hotel had no room availability in the period or its price was very high at the moment. Customer selections also could be affected by the policy of travel management office who is in charge of hotel bookings (Gustafson, 2012). Second, the purpose of the customers' visits can differ between their first- and

second-time visits. Lastly, the current study only considers online feedback reviews written by English. Several prior studies indicate that customers' feedback reviews written by their native languages can be more various opinions and perceptions on their experience because they come from all over the world (Schuckert, Liu, & Law, 2015). Thus, future studies should address these limitations to extend the findings.

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