

The Application of Text Mining Technology in Business Management—Take Hotel Management as an Example

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Abstract. In recent years, the development of the information industry has led to the rapid rise of data mining, and in the face of the trend of data mining development, the field of data mining has become a focal point of concern for various industries. As a very customer-focused service industry, the hospitality industry is imperative to popularize and intelligently integrate text mining into management in the context of rising human resource costs and the general intelligence of all industries. In this paper, the application of text mining technology in business management is explored, using hotel management as an example. The Porter's Five Forces model, the SWOT model are used to analyze the importance of unstructured data such as customer reviews and the great role of text analytics in the internal and external management of hotels. The recommendations for the integration of text mining and hotel management are proposed, suggesting that text mining should be commonly used in hotel management and recommending that managers adopt A small amount of manpower and a large amount of text mining to overcome the drawbacks of text mining and improve hotel operations.

Keywords: Text mining, customer oriented, hotel management, unistructural data.

1. Introduction

Intelligent hotel management is becoming an issue of concern and importance to the global hospitality industry. With the development of big data technology, text mining techniques are becoming more and more advanced and the importance of unstructured data is increasing day by day. At the same time, there is an urgent need for intelligent hotel management. The hotel industry under the sweep of big data, the connection between hotels and customers has become more direct and close, and the acquisition, mining and integration of big data through travel platforms will generate huge business value and unlimited possibilities for practitioners. It is imperative to decompose and reconstruct the big data generated by customers to assist practitioners in making scientific business management decisions. This paper analyzed 38,292 reviews posted on Booking.com and TripAdvisor from 191 hotels and found that analyzing these reviews and using the results to improve the management of hotels can be a great way to meet consumer demand and increase profitability [1]. However, the use of text mining technology is not yet widespread and the technology itself still has some drawbacks, so how should hotel managers scientifically use text mining technology to improve the competitiveness of hotels? How can hotels obtain a large and effective amount of textual information from their customers? How can hotel management and text mining technology be combined to maximize benefits? This paper will present the cases of three hotel groups, namely HOMEINNS, H World Group Limited and Green, and analyze them using a series of models such as STP to demonstrate the significant role of text mining technology in hotel management and give relevant suggestions.

2. Case of BTG HOMEINNS Hotels, H World Group Limited and Green

Text mining of the three largest hotel groups in China will be shown in this section: BTG HOMEINNS Hotels, H World Group Limited and Green. Considering that social media is one of the important information reference channels for many customers to make travel decisions, in all industries, the hotel industry has used social media for commercial purposes earlier and has a large

number of users. Tencent, WeChat and Sina Weibo are the two most commonly used social media in China. Previously, WeChat official account was the most commonly used marketing channel for hotels. However, in contrast, WeChat and WeChat provide a more closed and more private social network experience. Users cannot fully understand the personal information of other users who have followed the account together and their interaction with the hotel official account. At the same time, the hotel can't get comprehensive and pertinent user opinions and feedback. Unlike WeChat, Sina Weibo provides a more open social network service. Without paying attention to the official microblog account of a hotel, users can also browse all the news from the establishment of the account to the latest release, participate in the interaction with the hotel official and make comments. Through observation, it is also found that the above three hotel groups have made great improvements in internal management and strategic management by taking advantage of the features of higher customer participation in Weibo and flexibly using text mining technology and have made more profits. This also makes Sina gradually become one of the main platforms for social media marketing of domestic chain hotels. According to the 2018 China Hotel Chain Development and Investment Report released by the China Hotel Association, the First Travel Home Group, China Hotel Group and Green Hotel Group are the top five hotel group brands in the country (among which the First Travel Home Group is the second largest, China Hotel Group is the third largest, and Green Hotel Group is the fifth largest) [CHA], and they have a strong market competition relationship. Therefore, considering the representativeness, accessibility, comprehensiveness, effectiveness and convenience of the text content, this study selects the microblog official account of Home Inn Group, H World Group Limited Hotel Group and Green Hotel Group as the case study objects. At the same time, since December is the peak season for chain hotel operations, the time range of the selected content is from December 1, 2018 to December 31, 2018 [2].

3. Customers' Power

Why do these three hotel groups pay so much attention to customer reviews? According to Porter's Five Forces model, it is clear that the bargaining power of the customer has a significant impact on the profitability of the company. In fact, through observation, Potter's five forces model is also showing the message that buyers actually are influencing the other forces powerfully since they are all trying to compete for winning more buyers [3]. It is possible to recognize and respond to customers' thoughts in a timely manner, which can have a variety of positive effects on the hotel. To efficiently and accurately identify the sentiments and thoughts of customers in large volumes of unstructured data, which often exists in the form of unstructured data in online reviews and questionnaires, requires extensive and skilled use of text mining techniques [4].

4. Analysis on Management Strategies

Based on this case study, it is concluded that good use of text mining techniques to analyze unstructured data such as hotel reviews and questionnaires can contribute significantly to hotel management. The contribution can be divided into internal and external aspects, where internal means optimizing internal management and external means guiding strategic management. In the following section, the case in detail based on these two aspects will be analyzed, using SWOT analysis.

4.1. Internal Management

The first is the internal management section. Text mining technology can play the most direct role in this section. In one study of esports hotels, hotels in the sector used to erroneously believe that their strengths and weaknesses depended on having better computer equipment, but consistently falling profits showed that this was a one-sided and subjective judgement on their part. In fact, due to the shadow inflationary growth of the gaming industry, which has led to the rapid development of related industries as well, the industry entry barriers and technical barriers for gaming hotels are low and the

overall quality of the industry is low. After a sustained slump in the market, managers finally realized that the real weakness of the industry lies in the fact that most of the gaming hotels are converted from small hotels, with crowded spaces, poor accommodation facilities and simple decoration, leaving consumers with the stereotypical impression that "gaming wine is a poor quality hotel that provides computers". At the same time, some gaming hotels have multiple rooms with no smoke extraction system, poor hygiene and many safety hazards. These bad experiences have led to poor consumer perceptions of the gaming hotel industry [5]. It is not just e-gaming hotels, but for HOMEINNS, H World Group Limited and Green mentioned in the case, it works on the same principle. By identifying customer reviews on relevant platforms and questionnaires in text form that customers fill out at check-out, text mining can quickly identify keywords in them. For example, if the word "dining" appears frequently in a check-out questionnaire on a particular day, then the comments can be analyzed for granular sentiment based on the theme of "dining". The first step is to split the comments into sentences based on a topic-trait keyword list. The sentences are divided into short sentences, and the keywords in each sentence are extracted. The sentiment dictionary is used to score the sentiment of the divided text, with positive numbers representing positive sentiment, negative numbers representing negative sentiment and zero representing neutral sentiment. Based on the sentiment scores, the text was categorized into sentiment polarity, and the frequency of positive and negative sentences was counted [6]. The sentiment scoring phrases were aggregated for both Chinese and English comment data at feature level with the help of Python to obtain the final sentiment score matrix for Chinese and English [7]. For example, a large number of words like "bad", "horrible", "disgusting" and other words with negative emotions were retrieved for "dining". When words such as "bad", "horrible" and "disgusting" are retrieved in large numbers for "food and beverage", the hotel should check whether the quality and taste of the food and beverage it offers on that day are wrong. This approach helps the hotel to quickly identify what customers want from the hotel and make a quick judgement on the points where improvements can be made, which are often the ones that can significantly improve the hotel's bottom line in a short period of time.

4.2. Strategic Management

This research will then analyze external strategic management. The three hotel groups mentioned in the case see each other as competitors and consider themselves to be in the same market position as each other, players on the same track. But in reality, in the minds of their customers, H World Group Limited is a high-end hotel, while the other two are more like budget hotels. In fact, they offer almost the same level of room and food and beverage services, but the decoration of H World Group Limited seems to be a bit more upscale and more in line with the customer's imagination of a high-end hotel, while HOMEINNS and Green are the decoration of ordinary budget hotels, even though they are offering the same quality of services, but still hardly reminiscent of high-end hotels. So, in fact, from the consumer's point of view, if the consumer tends to save money, then HOMEINNS and Green might be the first choice; otherwise H World Group Limited might instead be his first choice. However, from the point of view of the three hotels themselves, they may be wondering why consumers do not choose themselves despite offering the same quality of service. When looking at this phenomenon through the lens of a hotel manager, it can be very difficult to identify the problem. But if use text mining techniques to analyze people's posts on travel-related platforms, finding out the real reasons for customers' choices becomes a very simple task [8]. Perhaps it would be easy for HASU managers to discover that they are losing some of their customers because customers wrongly judge them as expensive upscale hotels based on their décor, which means that HASU needs to put more effort into advertising that their prices are affordable [9].

5. Suggestions

Finally, based on the analysis above, this paper would give a bit of advice. The suggestions will be divided into two aspects, the first is to apply text mining more, and the second is to cooperate with relevant platforms.

5.1. Wider Applications

Firstly, hotels should apply text mining technology more generally. Today, with the development of web technology, the number of online reviews in hotels is becoming larger and larger, and manual processing means higher labor costs as well as lower efficiency and profitability. Text mining is a promising direction for improving the process of processing traveler feedback. However, the large number of reviews containing non-specific or non-emotional content negatively affects the ability of sentiment-based techniques to accurately summarize useful information from hotel reviews [10]. Therefore, the form in which hotels capture data could be more targeted to enhance the effectiveness of the text when analyzed. Also, hotels can adopt a small amount of manual pre-processing of text combined with text mining, which can also be very effective.

5.2. Cooperation with Relevant Platforms

Secondly, hotels can take a more proactive approach to cooperate with relevant travel platforms, such as TripAdvisor, China's VW Dianping and Ctrip Travel. In the hotel industry under the sweep of big data, the connection between hotels and customers is more direct and closer, and the acquisition, mining and integration of big data through travel platforms will bring huge business value and unlimited possibilities for practitioners. It is imperative to decompose and reconstruct the big data generated by customers to assist practitioners in making scientific business management decisions. By directly influencing the decision-making process of hotel consumers, online reviews play an increasingly important role in the hotel industry chain, and working with travel platforms is the most convenient and effective way to access these reviews. The integration of hotel data cannot be achieved without the construction of a good hotel management system, and travel platforms can also help to build a hotel management system. Simple Point Hotel Management System has a complete guest management, membership management system, complete reports and data analysis, from the daily management to capture all-round user data, at the same time, Simple Point Hotel Management System achieves real-time direct connection with WeChat, OTA platform, in the acquisition of orders at the same time, a lot of information in series, to collect a surprising number of customer data, which are more accurate and comprehensive understanding of the user [11]. For example, what are the cities frequented by the same user, what are the reasons he stays in hotels more often; what kind of hotels he chooses to stay in each time, what type of rooms he prefers; whether he is a loyal customer of a certain brand or likes to try different hotels. The more hotels know about their customers, the better they can meet their needs and provide a customized service. The value of the data obtained by Simplex is not only to influence the travel decisions of other users, but also to help hotels to manage user relationships in a more convenient and targeted way, to increase customer stickiness, and to provide a basis for accurate marketing decisions, and ultimately to achieve increased revenue.

6. Conclusion

This study found that text mining plays an important role in improving the efficiency and profitability of hotel management. Internally, it can help hotel managers to quickly and accurately identify hotel pain points and improve internal management; externally, it can help hotel managers to avoid subjective misjudgments about the market position and competitive position, to easily recognize the image of the company in the eyes of customers and to develop strategies based on this. This paper offers suggestions for the future integration of text mining into hotel management, suggesting the widespread use of text mining techniques in hotel management and recommending that managers use a small amount of human effort and a large amount of text mining to overcome the

drawbacks of text mining and improve hotel operations. Text mining can be applied not only in hotel management but also in business management as derived from this paper, so that this technology can benefit more areas and contribute to the overall harmonious development of human society. Further development of text mining technology in the future, for non-specific or non-emotional content, sentiment-based text mining technology may no longer have the problem of inaccurate analytical summaries, then the above-mentioned practical use of variable operations can be further optimized to facilitate in-depth research on this topic.

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