

Retraction

Retracted: Intelligent Hotel Resource Sharing System Based on Data Fusion

Wireless Communications and Mobile Computing

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

- [1] W. Jiang and B. Liu, "Intelligent Hotel Resource Sharing System Based on Data Fusion," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 7439903, 8 pages, 2022.

Research Article

Intelligent Hotel Resource Sharing System Based on Data Fusion

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In order to further develop cross-platform hotel resource sharing, a cross-platform comparative study of user review text of intelligent hotel resource sharing system based on data fusion is proposed. X hotel reservation platform and Z short-term rental platform were selected as the experimental objects, and 86,635 user comment texts of relevant housing sources in a city were collected. Cross-platform comparative analysis of user text comments was conducted by combining the LDA model-themed social network and the theme sentiment analysis method. The experiment result shows the following: Based on the emotional score of each theme, the positive, negative, and neutral emotional intensity values of hotel platform reviews were 0.76, 0.06, and 0.18, respectively, and the emotional intensity values of shared accommodation platform were 0.82, 0.05, and 0.11, respectively. The research finds the similarities and differences between the two platforms in the social network and emotion of the topic and explains the substitutability and complementarity of the two platforms in products and services from the perspective of microuser comments. *Conclusion.* This study provides an important practical reference for platform managers to develop and improve accommodation products and services.

1. Introduction

Sharing, as a basic consumption behavior, existed in human society hundreds of thousands of years ago. It is a kind of product or service distribution behavior and process that people give to each other out of need without investment return [1]. With the development of society, the concept of sharing has changed. Relying on Internet communication technology, now sharing the range has been extended from mainly from family and close friends to driven by the Internet. All kinds of local and national organizations and public communities within the scope of shared items from tangible goods also expand on these intangible products such as music thinking skills. In the past decade, with the development of the social economy, customers have higher requirements for product value, the awakening of ecological awareness, and the progress of technology. The change of attitude of product ownership and the need of social relations jointly promote the rapid growth of sharing economy. The tourism and accommodation industry is one of the pio-

neer industries in the practice development of sharing economy. Sharing economy and accommodation industry blend with each other and form shared accommodation [2]. Shared accommodation refers to a type of nonstandard accommodation where the owner temporarily rents out the vacant house (all or part of it) to tourists through an online platform, as shown in Figure 1. Compared with the traditional accommodation industry, shared accommodation relies more on the technical support of the online platform. Different from the standardized services of the traditional accommodation industry, shared accommodation pays more attention to the experience and sociability of customers. The type of housing provided by shared accommodation is relatively more rich; it can be private rooms, luxury villas, cabins, trailers, containers, and so on.

2. Literature Review

Gao et al. conducted an online survey on Airbnb users and believed that their motivation factors were mainly as follows:

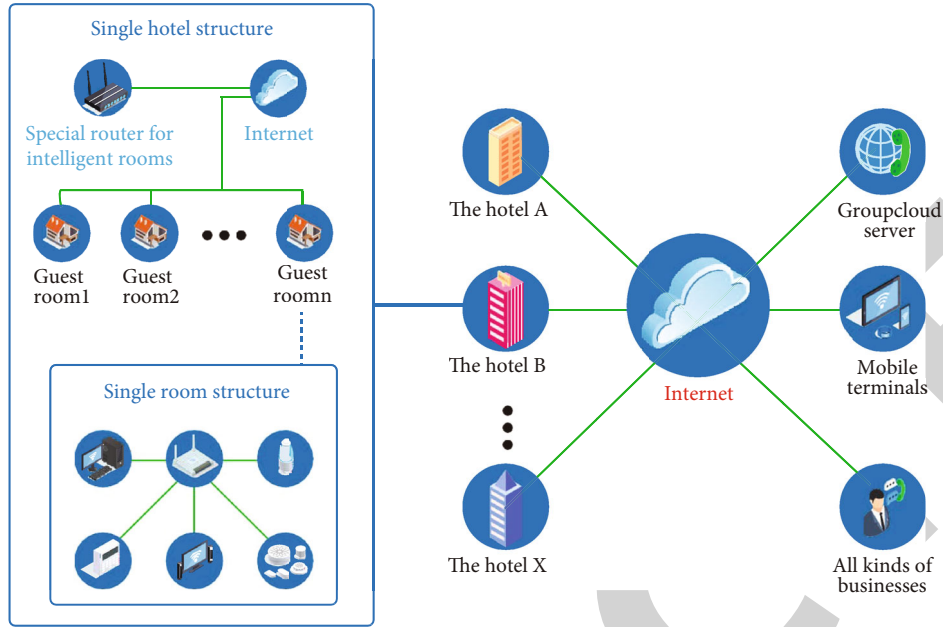


FIGURE 1: Smart hotel resource sharing.

interactive, accommodation benefits, novel, sharing economic trends, and local authenticity. Based on this, users were divided into money-savers, home seekers, collaborative consumers, pragmatic novelty seekers, and interactive novelty seekers [3]. Luo et al. found through investigation that tourists refuse to use sharing economy accommodation services mainly due to (lack of) trust, (lack of) effectiveness, and (lack of) economic benefits. The driving factors are sustainable community and economic interests [4]. When exploring the relationship between Airbnb users' decision-making behavior and reputation of trusted hosts, Muhammad et al. found that trust factors reflected based on website photos had a greater impact on users' decision-making than reputation factors reflected based on website comments [5]. While taking a study of home considerations, Zhang et al. found that the motives of tourists' choice were mainly for obtaining more travel experience and saving money for real cultural experience [6]. When exploring the relationship between Airbnb users' decisions and reviews, Li et al. found that social distance would affect the credibility of users' reviews, the breadth of users' shared experiences would have a positive impact on the usefulness of information, and the credibility of reviews and usefulness of information would have a positive impact on the acceptance of reviews, thus affecting purchase intentions [7]. Wang et al. discussed the changes in couchsurfing by means of ethnography and pointed out that couchsurfing has gradually developed from a simple exchange of reception services into a fashionable way of travel, which is also a transformation of shared accommodation from commercial to social. At the same time, they also based on the theory of performance, from the online and offline two aspects of practical behavior of couchsurfing and pointed out that online display is to set the basic situation of couchsurfing, online interaction is to define the reciprocal relationship between the sofa owner

and the couchsurfing, and offline performances are based on the tourist-angst phenomenon, in which space plays an important role [8]. Liu et al. took Airbnb user comment data as the research sample, collected data with crawler technology, constructed a perception model of tourists' home stay experience using grounded theory, and extracted high-frequency words, respectively, from positive and negative comments of tourists. Then, it analyzes the influencing factors of tourists' positive perception and negative perception and compares urban homestay with rural homestay. The results show that tourists' perception of homestay experience runs through the three stages of expectation experience before travel, experience experience, and aftertaste experience after travel. Tourists' perception of home stay experience is composed of five dimensions including preparation for expectation experience, surrounding environment, core scene, experience, and postexperience evaluation [9]. Based on the above practical and theoretical motivations, this paper collected 86,635 guest text comments from hotel reservation platform (X hotel platform) and shared accommodation platform (Z short-term rental platform) in a city and integrated LDA theme model social network analysis (SNA) and sentiment analysis methods to carry out cross-platform user review text topic analysis. The study found similarities and differences between the two platforms in user review topics, social networks, and emotional tendencies. The results of this paper provide important theoretical guidance and practical reference for the development and improvement of products and services for the managers of relevant accommodation platforms.

3. Research Method

3.1. Data Sources. The data of this study are from the online reviews of the hotel reservation platform and the shared

accommodation platform from November 2018 to November 2021, and a city on the platform is selected as the collection object of the review data. The review data of the hotel reservation platform is taken from the X hotel platform, and the review data of the shared accommodation platform is taken from the Z short-term rental platform. The review data of the hotel reservation platform is taken from the X hotel platform, and the review data of the shared accommodation platform is taken from the Z short-term rental platform. Among them, (1) the X platform is the online hotel reservation industry. Domestic hotel industry benchmarking X has been occupying the online accommodation booking first of commercial value of the market position and maintained a strong competitive power. Due to the number of comments in the hotel industry being more, this article crawled home page the jurisdiction of city hotels and corresponding comments, eventually getting effective data of 70 hotels and 55,761 guest text comments. (2) Z short rent platform is the domestic online short rent a Shared accommodation industry star, the platform with its brand of humanized service has won numerous users Houses the platform of the world's more than 800000, the city covers more than 710 Z platform is presented in this paper crawl between 5, 534 homes, because some houses without comment, the final 2 635 valid data Therefore, a total of 86,635 text review data were obtained from the above platforms in this study.

3.2. Comment on the Text Topic Mining Model. The LDA model is called a three-layer Bayesian probabilistic model, which belongs to the document topic generation model [10]. The user comment text will also include a topic set of concern content with a certain probability, and the topic includes a word set with a certain probability. The comment text, topic, and word all follow polynomial distribution, as shown in Formulas (1) and (2) [11]:

$$z \sim \text{Multi} \left(z \mid \left(\overline{\theta}_m \right) \right), \quad (1)$$

where z represents the topic random variable generated in the m th comment and $\overline{\theta}_m$ represents the polynomial distribution parameter of the $M * H$ comment in the matrix of m , where M represents the number of comments and K represents the number of topics:

$$w \sim \text{Multi} \left(w \mid \left(\overline{\theta}_k \right) \right), \quad (2)$$

where w represents the word random variable generated by the k th topic, $\overline{\theta}_k$ represents the polynomial distribution parameter of the first topic in the matrix $K * V$, and V represents the number of k words.

The research process is mainly divided into the following five specific steps [12]. (1) Review data are collected on the X hotel platform and the Z short-term rental platform to form cross-platform review text library required for posttext analysis; (2) the preprocessing of text data mainly includes removing word segmentation and tagging part of speech; (3) based on the LDA topic model, text comments are clus-

tered and comment topics are mined; (4) the social network is constructed based on the relationships among different topics and the relationships among the internal features of the topics, and the sentiment analysis of each topic is carried out based on the sentiment dictionary; and (5) LDA clustering social network analysis and sentiment analysis results of hotel reservation platform and shared accommodation platform were compared and analyzed [13]. The specific process is shown in Figure 2.

This part mainly introduces the main methods used in the relevant research process. (1) Data preprocessing. In order to improve the efficiency of word segmentation and ensure the accuracy and integrity of word segmentation, this paper combines automatic word segmentation with manual processing to process text. Finally, the Jieba packet in Python is used to complete the word segmentation process of text information [14]. (2) LDA topic modeling. Text classification topics are based on the clustering results of the LDA model. Since the effect of LDA topic extraction is directly related to the determination of topic number, it is necessary to have a prior estimate of the number of topics contained in the dataset before the determination of the optimal topic number. Therefore, this paper estimates the number of LDA topics at 3-8 based on the empirical rules of relevant literature. The coherence scores of hotel and shared accommodation reviews for 3-8 topics were calculated to determine the optimal number of topics. After determining the optimal number of topics, this paper uses the Python visualization tool LDAvis package to perform a visual analysis of features under topics. In order to ensure clear boundaries between themes, the feature words (such as house and room) with unclear theme words and appearing in multiple themes were deleted, and 8 words with relatively high frequency were selected as theme representatives, and the topic description names were further confirmed according to the semantic relationship of the feature words. For key words and results in the literature of coincidence degree is higher, the theme of the code in this paper, combining with the relevant literature on the theme of tourism management, for the key and the theme of the differences in the results in the literature, by a group of researchers according to each topic list of key names, for sure, again by another group of researchers to check with the name of the theme, for final confirmation. (3) This part firstly sorts out and summarizes the LDA feature words and takes the feature words under the same theme as the feature identification of the theme [15]. As shown in Table 1, the nondiagonal element of the theme-theme external cooccurrence matrix refers to the number of occurrences of two key words in the same comment, and the diagonal element refers to the number of occurrences of this word in all comments [16]. Secondly, in order to reveal the association relationship of feature words under a single theme, an internal cooccurrence matrix is constructed according to the cooccurrence relationship between feature words, as shown in Table 2. Finally, Ucinet and Netdraw software are used to visually display the results of the theme social network of the X hotel platform and Z short-term rental platform. (4) According to the results of LDA clustering, emotion words were extracted from each topic

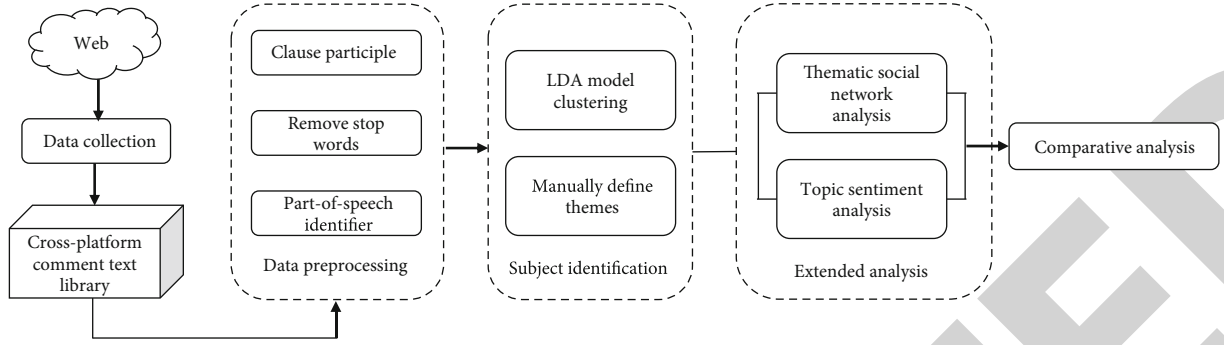


FIGURE 2: Research process.

TABLE 1: Topic-sample cooccurrence matrix for topic.

| Topic | (1) Overall feeling | (2) Room hardware | (3) Health facilities | (4) Domestic service | (5) Convenient transportation | (6) The hotel hardware | (7) Get along with the interaction |
|-------|---------------------|-------------------|-----------------------|----------------------|-------------------------------|------------------------|------------------------------------|
| 1 | 12686 | 643 | 2871 | 841 | 2101 | 2122 | 2531 |
| 2 | 643 | 1984 | 742 | 281 | 428 | 548 | 530 |
| 3 | 2871 | 742 | 10392 | 918 | 2018 | 1956 | 2587 |
| 4 | 841 | 280 | 918 | 3520 | 835 | 1306 | 876 |
| 5 | 2101 | 428 | 2017 | 835 | 7101 | 1669 | 1365 |
| 6 | 2122 | 547 | 1956 | 1306 | 1669 | 7955 | 1914 |
| 7 | 2531 | 529 | 2587 | 877 | 1364 | 1915 | 9501 |

Note: this table is based on X hotel platform review data.

TABLE 2: Feature-feature cooccurrence matrix example.

| Feature word | (1) Price | (2) Settings | (3) Cost performance | (4) Feelings | (5) Layout | (6) Overall | (7) Level | (8) Comfort level | (9) Sentiment |
|--------------|-----------|--------------|----------------------|--------------|------------|-------------|-----------|-------------------|---------------|
| 1 | 563 | 84 | 57 | 40 | 2 | 43 | 4 | 1 | 1 |
| 2 | 84 | 6450 | 332 | 300 | 17 | 142 | 32 | 7 | 15 |
| 3 | 58 | 332 | 3066 | 206 | 6 | 121 | 25 | 6 | 3 |
| 4 | 40 | 300 | 205 | 2559 | 23 | 245 | 32 | 4 | 12 |
| 5 | 2 | 18 | 6 | 23 | 90 | 4 | 1 | 0 | 11 |
| 6 | 43 | 143 | 121 | 245 | 4 | 1173 | 8 | 1 | 0 |
| 7 | 4 | 31 | 25 | 35 | 1 | 7 | 165 | 0 | 0 |
| 8 | 1 | 7 | 6 | 4 | 0 | 1 | 0 | 50 | 0 |
| 9 | 2 | 15 | 3 | 12 | 12 | 0 | 1 | 0 | 33 |

Note: this table is based on review data from the X hotel platform on general feeling topics.

based on HowNet dictionary (8936) and manual annotation (989) for emotion analysis, and the polarity of emotion in the comment text was divided into positive, neutral, and negative teraries. Considering the different complexity and emphasis of consumer comments, a single comment may evaluate multiple topics at the same time; that is, the matching between topic and emotion words may be one-to-one, multipair, and one-class. Therefore, all comments are separated by single sentences according to punctuation marks, and the sentence patterns of [theme feature words, emotion words] are matched to confirm the emotional tendency of users of each theme. Take the hotel review as an example, it is convenient to travel next to the subway station, the waiters are very warm, and they take the initiative to ask about hygiene. See Figure 3 for the analysis process.

4. Interpretation of Result

4.1. LDA Topic Mining Results. The classification topic of text is based on the clustering of subject words, and the score of theme consistency can be calculated according to the number of different topics [17]. Since the establishment of the optimal number of topics requires a certain prior estimate, the number of topics for the hotel reservation platform and shared accommodation platform is estimated to be 3-8. In this experiment, debugging iteration is conducted to achieve the optimal clustering result. Due to the large number of feature words extracted from the LDA model and the large number of topic feature words that are difficult to be directly used in practical analysis, this study selected eight of the most frequently used words as topic representation

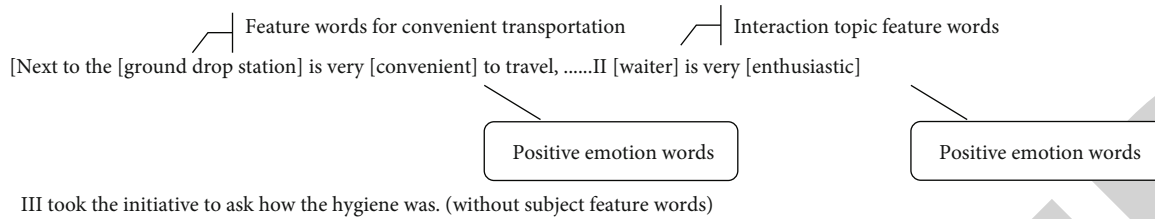


FIGURE 3: Example of topic sentiment analysis.

and conducted a summary experiment to show that the X hotel platform had the highest (coherence score when it had seven themes, score = 0.421). The results of the LDA model show that the seven main themes of user text reviews on the platform are facilities, sanitation, convenient transportation, room hardware, interaction, general feeling, family service, and hotel hardware. When the number of topics on the Z short-term rental platform is 6, the consistency score is the highest (coherence score = 0.420). The results of the LDA model show that the six themes of text reviews on this platform are the general feeling of hardware interaction and bedding in rooms with convenient transportation and facilities, and the five themes of hardware interaction and general feeling are the common concerns of users on the X hotel platform and Z short-term rental platform. In addition, home service and hotel hardware are featured themes of the X hotel platform, while bedding is a featured theme of the Z short-term rental platform.

4.2. Results of Thematic Social Network Analysis. This part further builds a social network based on the results of the LDA model to explore the correlation between the topics of the two platforms specifically; this part will use UCINET 6 software to investigate the correlation between topics and the cooccurrence relationship of feature words under a single topic through the cooccurrence network [18]. Further analysis on the theme of facilities and sanitation and the theme of transportation convenience, which overlapped with each other, respectively, focused on overall facilities and transportation convenience, and the comment features of the two platforms were relatively similar. There are slight differences in user concerns between the hardware in the room and the interaction theme. For example, under the theme of room hardware, X hotel users focus on standardized hotel room facilities, such as bathtubs and floor-to-ceiling windows. Z short-term rental users focus on descriptions of household facilities, such as refrigerators, washing machines, and microwave ovens. Under the theme of getting along and interacting with each other, X hotel users have more standardized and unified features for address, such as the receptionist and lobby manager, while Z short-term rental users have more diversified features for address, such as the landlord sister and housekeeper. (3) As for the general feeling theme, users of the X hotel platform pay more attention to its price and grade, while users of the Z short-term rental platform pay more attention to the style of house supply and accommodation experience. Finally, both X hotel platform and Z short-term rental platform have distinctive themes. (1) The theme of family service and hotel hardware

is exclusive to the LDA theme model of the X hotel platform. The theme of family service indicates that users prefer the X hotel platform when traveling with family as a unit, highlighting the advantages of standardized hotel accommodation. The theme of the hotel hardware, such as cafeteria and fruit service, is also one of the key concerns of X hotel platform users. (2) The bedding theme is a unique result of the LDA theme model of the Z short-term rental platform, such as bed sheets, quilts, pillows, and quilt covers.

First of all, the size of nodes is directly proportional to the number of themes; that is, the larger the nodes, the more users pay attention to the theme [19]. In terms of the relationship between themes, the seven themes of the X hotel platform account for the largest proportion, respectively: (1) price environment and grade are the overall feeling theme of the feature word, (2) the theme of facility sanitation has features such as facility hardware and sanitary conditions, and (3) among the six themes of hotel hardware theme Z, featuring breakfast fruits and restaurants, the largest ones are, respectively: (1) big brother big sister and beauty as a feature of the topic of interaction [20]; (2) the theme of transportation convenience with bus, subway, and line number as its characteristic words; and (3) general sense theme with general sense arrangement as the feature word. Second, the thickness of connection between the subject line in the figure and the corresponding node theme is proportional to the number commonly appearing; it can be seen in the X hotel platform of the social network that the theme and subject line thickness difference between is small, showing that attention to the platform theme hotel users is distributed evenly; the hotel reservation platform focuses on subjects that users comment on; there is no obvious preference [21]. However, in the social network diagram of the Z short-term rental platform, the three themes of interaction and transportation convenience and general feeling are particularly closely related, indicating that relevant users of this platform pay particular attention to these three themes.

Finally, from the perspective of the relationship of feature words under a single theme, there is little difference between the three themes of traffic location interaction and general feeling between the two platforms, while there is a significant difference between the users of the two platforms for other themes.

Among them, the internal social network of the theme of transportation convenience is the closest; that is, the feature words such as bus station and walking appear frequently at the same time, indicating that users of the two platforms focus on the theme of transportation, such as accessibility;

TABLE 3: Subject sentiment analysis results.

| Topic | Overall proportion (%) | Hotel | | | Overall proportion (%) | Shared accommodation | | |
|--------------------------------|------------------------|----------|----------|------------|------------------------|----------------------|----------|------------|
| | | Frontage | Downside | Neutrality | | Frontage | Downside | Neutrality |
| Overall feelings | 26.2 | 0.79 | 0.0 | 0.17 | 20.1 | 0.84 | 0.05 | 0.10 |
| Get along with the interaction | 21.1 | 0.83 | 0.06 | 0.11 | 38.9 | 0.86 | 0.05 | 0.09 |
| The hotel hardware | 15.7 | 0.70 | 0.0 | 0.22 | | | | |
| Convenient transportation | 14.2 | 0.77 | 0.04 | 0.19 | 20.9 | 0.82 | 0.04 | 0.13 |
| Health facilities | 11.6 | 0.74 | 0.06 | 0.20 | 12.1 | 0.81 | 0.06 | 0.13 |
| Domestic service | 7.1 | 0.68 | 0.08 | 0.24 | | | | |
| Room hardware | 4.0 | 0.54 | 0.15 | 0.31 | 5.5 | 0.67 | 0.11 | 0.22 |
| Beddings | | | | | 2.5 | 0.73 | 0.12 | 0.15 |
| Emotional intensity | | 0.76 | 0.06 | 0.18 | | 0.82 | 0.05 | 0.11 |

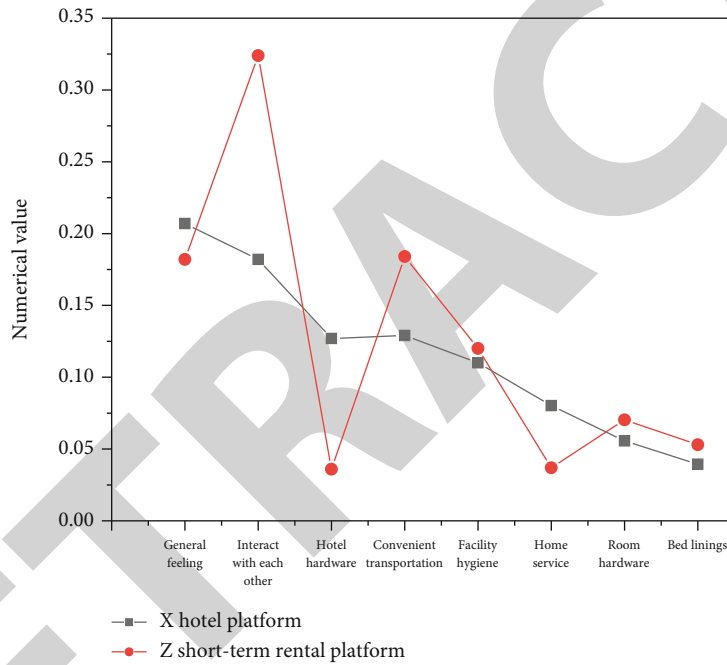


FIGURE 4: Results of theme emotional intensity (vs. Z short-term rental of X hotel).

under the theme of getting along and interacting with each other, the social network nodes of the Z short-term rental platform centered on the landlord are not closely connected, while the nodes of the X hotel platform are more connected. Under the theme of general feeling, users of the X hotel platform focus on cost performance, while users of the Z short-term rental platform focus on style and layout. Under the theme of room hardware, users of the X hotel platform focus on the provision of air conditioning and heating, while users of the Z short-term rental platform also pay attention to microwave oven, washing machine, refrigerator, and projection. Under the theme of facilities and sanitation, users of the Z short-term rental platform will pay attention to the sanitary conditions of kitchen utensils on the basis of the concerns of users of the X hotel platform. Under the theme of family service, the comments of the X hotel platform users are mainly child-centered with few nodes connected. Under the theme of hotel hardware, users of the X hotel platform

take breakfast as the central node, and there are many nodes connected, indicating that breakfast dishes and restaurants are the focus of users of this platform. Under the theme of bedding, bed sheets are the central node, and quilts and covers are also important themes that users of the Z short-term rental platform pay attention to.

4.3. Subject Sentiment Analysis Results. The topic sentiment analysis will mine the emotional tendencies of each LDA topic and further identify the differences between user comment texts on the two platforms. This part mainly judges the positive, negative, and neutral triad emotional attitudes of comment texts through emotional polarity [22]. The emotional score is obtained as shown in Table 3. After the emotional score of each theme is obtained, the emotional intensity is calculated by the weighted average formula according to the overall theme proportion. Finally, the emotional intensity is sorted according to the theme proportion

of each platform, and the relevant results are shown in Figure 4.

Based on the emotional score of each theme, the positive, negative, and neutral emotional intensity values of hotel platform reviews were 0.76, 0.06, and 0.18, respectively, and the emotional intensity values of the shared accommodation platform were 0.82, 0.05, and 0.11, respectively. By contrast, the positive emotions of users on the X hotel platform scored low, while the positive emotions of users on the Z short-term rental platform fluctuated greatly among different themes. There was almost no difference in the overall score and change fluctuation of negative emotions between the two platforms. Among them, in the positive review, the general feeling of getting along and interaction and convenient transportation are the two platforms with positive score high topics, while in the negative review, the hotel platform negative reviews mainly focus on the three themes of room hardware, family service, and hotel hardware. Negative comments about shared accommodation focused on bedroom hardware and sanitary facilities.

5. Conclusion

In this paper, the X hotel platform and Z short-term rental platform are taken as the research object, based on the LDA thematic social network and sentiment analysis, to explore the differences in users' emotional tendencies in the thematic social network and theme of user text reviews on the two platforms. Cross-platform user review text analysis explores the similarities and differences between the two mainstream accommodation platforms; user platform themes provide important theoretical guidance and practical reference for hotel booking platform and shared accommodation platform managers to effectively carry out platform management. However, this study still has some shortcomings and needs to be expanded. For example, this paper does not consider the influence of the time factor, so the evolution mechanism of platform user comment topics can be further studied in the future.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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