





SPECIAL FOCUS PAPER

AI-Powered Mobile Feedback Systems for Real-Time Service Quality Improvement in Hotels

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ABSTRACT

The explosion in electronically submitted guest feedback has created new opportunities for managing hotel service quality. With online review platforms, smartphone apps, and messaging applications now generating unprecedented quantities of unstructured textual guest feedback about hotels, manually monitoring and responding to online feedback at scale is not feasible. Forward-thinking hotel operators are instead implementing artificial intelligence (AI)-enabled guest feedback platforms to inform operations in real time. This paper reports a review of academic literature, industry articles, and hotel case studies describing the use of AI to analyze guest feedback within hotels. Thematic analysis was conducted to identify AI techniques that are commonly used to analyze guest feedback, implementation themes, and reported results. Results show that AI is most used in feedback systems to perform sentiment analysis, aspect-based sentiment analysis, topic extraction, or automated/semi-automated responses. Reported uses include enabling faster service failure detection, targeted service recovery, and increased responsiveness with real-time and mobile feedback channels. Articles also discussed key contextual factors that affect implementation success, such as language, cultural variations in guest expression, and the receiving hotel's preparedness. This paper contributes to the hospitality literature by centring conversations about AI use in guest feedback analysis on management and operational issues rather than algorithm accuracy. Managers can use these findings to understand how other organizations have leveraged AI-enabled guest feedback systems as decision-support technology rather than automation technology. These findings support the design of mobile feedback systems as operational decision-support tools rather than automation replacements.

KEYWORDS

artificial intelligence (AI), guest feedback analysis, sentiment analysis, hospitality technology, service quality management, guest satisfaction, mobile feedback systems

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1 INTRODUCTION

Encouraging guests to share feedback has always been an important aspect of hotel management worldwide. Previously hotels utilized guest feedback cards and post-stay survey tools, but now most guest comments are left publicly through online channels like review sites, hotel apps, or booking engines. Channels for digital guest engagement have allowed hotels to capture massive amounts of unstructured text data about guests' experiences and perceptions about hotel services [1]. Manually keeping track of guest reviews across these different sources can become unfeasible, especially with larger hotel brands with hundreds or thousands of properties.

With increasing digital guest engagement, hotels have been implementing artificial intelligence (AI)-powered tools to automatically source and analyze guest reviews at scale. Research has shown that different digital technologies can have a considerable positive effect on guest satisfaction and loyalty intentions [2]. Technologies such as mobile technology have allowed guests more opportunity to share direct feedback with hotels during their stay or after checkout. With more avenues available for guests to digitally share their experience, guests now expect hotels to be able to monitor these platforms and respond to their reviews quickly. Machine learning methods such as sentiment analysis allow hotels to sort reviews by attributes of service, monitor commonly occurring service failures, and pinpoint areas of improvement across large datasets of reviews [3]. Prior research has shown that responding quickly and with empathy can greatly influence guests' perceptions of service recovery and response quality [4].

While there are various technologies hotels can use to take advantage of AI-powered feedback analytics, there has been minimal research to understand hotels' managerial processes of adopting these technologies. Previous research has mainly focused on constructing models to classify sentiment and analyzing text mining algorithm effectiveness [5]. Discussion on taking these AI-generated insights to monitor service quality, adjust hotel operations, and drive data-based decision-making has been limited. Areas such as implementation process, human–AI interaction, and readiness to take advantage of guest feedback as business intelligence have been overlooked.

Therefore, this systematic literature review aims to explore how hotels are implementing AI-based guest feedback analysis systems in their operations. Through reviewing academic journals, industry articles, and hotel use cases, this review will discuss what AI technologies are currently being used for guest feedback analysis, common use cases, and barriers to operationalization. The results of this study will provide academic and professional audiences with insights on how AI-powered guest feedback systems are currently being used to manage service quality.

2 LITERATURE REVIEW

2.1 Theoretical foundations of customer feedback in hospitality

Customers' perception of service quality stems from their satisfaction or dissatisfaction with the hospitality service offering. Satisfaction is determined by the customers' pre-consumption expectations of the performance of hospitality service versus their actual perceived performance of the service received. This relationship is defined by the expectation-disconfirmation theory, which models satisfaction as

the result of positive disconfirmation of expectations and dissatisfaction as the result of negative disconfirmation of expectations [6]. Guests will arrive at hospitality properties with different expectations due to budget-conscious travel, brand positioning, cultural backgrounds, and previous personal experiences.

Paper comment cards represent legacy standardized feedback collection tools used throughout the hospitality industry. Traditional feedback methods have been criticized for low response rates and biased data; on the other hand, there is scholarly evidence that employee job satisfaction has a positive effect on service quality perceptions, which in turn affects customer satisfaction and ultimately hotel profitability. Digital feedback tools allow hotels to collect low-friction, qualitative guest feedback at various moments across the guest journey instead of at departure.

Hotel industries have leveraged quantitative service gap measures such as SERVQUAL to understand common areas of hospitality consumer dissatisfaction [7]. Unstructured feedback in the form of written comments, online reviews, and messaging conversations reflect guest perception gaps that standard surveys may not account for due to standardized questionnaires.

2.2 AI and natural language processing technologies for feedback analysis

Hospitality industries use AI in the form of natural language processing (NLP) to analyze unstructured guest text feedback. Text-based feedback can be classified for positive, negative, or neutral sentiment at scale to allow hotels to quickly understand the overall sentiment of their guests [3]. Initial approaches to sentiment analysis relied on rule-based lexicons.

Machine learning-based sentiment analysis techniques using transformer-based architectures such as BERT (Bidirectional Encoder Representation from Transformers) have achieved state-of-the-art results for sentiment classification by better understanding the semantics of words in context versus individual keyword spotting [8]. Further research comparing various NLP models found that fine-tuned large language models had better hospitality-specific sentiment classification and predicted star ratings better than traditional supervised learning NLP models [9].

Individual comments can be broken down into finer-grained aspects such as comments about housekeeping, food, or staff. These categories are not predefined and instead extracted via AI, allowing for more detailed analysis of sentiment within one review [10]. Topic modeling is another form of AI analysis that allows hotels to cluster feedback into common topics without the need for human predefined labels.

2.3 Mobile platforms as feedback channels

Mobile applications are used by guests throughout their stay at hotel facilities. Hotels use mobile apps to book stays, mobile check in and check out, request hotel services, and message hotels in real time. Guests also use these applications to provide reviews and feedback about their stay. Review data is considered as delayed feedback since it generally occurs after a guest checks out of the property. Research on mobile platforms shows that interactive mobile technologies support value co-creation by supporting customer engagement across multiple touchpoints in the service journey, from first awareness to post-service advocacy, especially with regard to real-time feedback systems, which capture guest experiences at key service moments [11].

Since feedback is given after a stay is completed, it does not allow for hotels to take any corrective actions to improve the guest's stay. Feedback given directly on mobile devices allows guests to provide real-time feedback about their experiences. Industry implementations further demonstrate that the benefit of digital feedback over post-stay surveys is the ability to add metadata about the feedback. For example, when the feedback was given and where the guest was when providing feedback. Push notifications are another benefit that allows hotels to nudge guests to provide feedback after they use a hotel service. Positive examples include asking guests to rate the food after dining in the hotel's restaurant or asking guests to provide feedback about the hotel gym.

If a hotel receives a negative piece of feedback about the hotel gym while the guest is still staying at the hotel, the hotel can proactively contact the guest to see how they can improve their experience. According to the reports, hotels that have implemented real-time guest feedback reduction see a decrease in negative feedback after guests check out since issues are resolved before checkout [12]. Conversational AI refers to the ability for guests to leave feedback in natural language through a chatbot.

2.4 Real-time analytics and service quality improvement

Research exploring the trends of guest satisfaction in the hotel industry has shown that changing guest expectations require hotels to continuously adjust their methods of feedback monitoring in order to maintain service excellence [13]. Additionally, real-time alerts can be programmed into these systems to flag negative comments that need immediate attention.

Negative reviews can be turned around and increase perceptions of a guest's stay if the hotel responds in a timely and genuine fashion. Response time and tone were found to be significant factors that affected guests' perceptions following an interaction [14]. The relationship between dimensions of service quality and customer loyalty is mediated by variables including brand image and switching costs, thus supporting the need for comprehensive feedback management [15]. Rather than treating AI touchpoints as another platform to complete reporting responsibilities, hotels should use these opportunities to enhance service and hospitality.

2.5 Contextual considerations in international hospitality

Another concern hotels with international visitors need to consider is the additional challenge of receiving feedback in different languages. Hotels also must ensure expectations are met when it comes to responding to negative reviews. Review analytics can be vital to properties in tourist areas that attract guests from many different cultures. Studies have shown that individuals from different national cultures vary when it comes to publicly expressing negative incidents and complaints. Hotel guests, for instance, are significantly more likely to post a negative review following a service failure [16]. Studies have shown that consumers from different cultures perceive and respond to service recovery efforts in different ways. National culture influences consumer expectations of service recovery [17], [18].

Hotels can leverage AI-powered insights to provide multilingual sentiment analysis and tailor recovery comments based on the guest's language. Instead of focusing on individual countries, most research focused on the application of review analysis across the global hospitality industry.

3 MATERIALS AND METHODS

3.1 Research design

The study utilized a qualitative secondary research strategy utilizing a systematic literature review (SLR) methodology. Secondary research utilizes previously collected academic and industry-related publications as opposed to primary data collected directly from human subjects or organizations. The decision to utilize an SLR was based upon the fact that AI-enabled guest feedback systems represent an emerging field of study where there is an abundance of academic case studies, industry reports, and empirical research that reports the current usage and results of these systems [19].

A qualitative approach to this study was most appropriate since the purpose of the study is to identify how hotels are using AI-enabled guest feedback systems, the positive and negative aspects reported of the system, and the contextual factors that influence the implementation of these systems versus testing pre-defined hypotheses. To increase the credibility of the findings through multiple types of supporting evidence, data triangulation was employed using academic literature, industry reports, and documented hotel case studies.

3.2 Data collection

Secondary data collection occurred through the collection of peer-review academic journal articles, hospitality industry publications, technology vendors' case studies, and publicly available documentation (i.e., conference presentations and awards) that describe hotel implementations of AI-based guest feedback analysis systems. Articles published in academic journals were given preferential treatment because they typically have greater focus on research methodology, though industry white papers and case studies were referenced where necessary to provide further details on topics relating to implementation that are not typically covered in academic journals.

Articles were searched in fields related to AI, NLP, sentiment analysis, mobile guest feedback systems, and hospitality service quality management. Only articles published within the past several years were considered to avoid discrepancies with modern technological ability.

3.3 Data analysis approach

All articles were analyzed with qualitative thematic analysis. Articles were reviewed thoroughly by the researchers. Researchers immersed themselves in the content of the articles. Initial coding was done on applicable text. Researchers used initial coding to identify common themes regarding what AI methods were used to analyze feedback, how they were being used operationally, what results were reported, and what to keep in mind when implementing these.

Coding was done in phases, and codes were grouped into themes that fit with this research's intentions. Recurring results were prioritized over results mentioned in only one article. Through this process the researcher was able to determine what patterns and useful information appeared most frequently about the use of AI guest feedback systems in hotels [20].

3.4 Methodological limitations

The study has relied exclusively on secondary data and therefore is susceptible to publication bias; thus, unsuccessful or unfavorable implementations of the AI-enabled guest feedback systems may have been underreported. In addition, the rapid development of AI technologies implies that the findings of this study may not continue to accurately reflect current practices as new tools and methods become available. Lastly, as a qualitative review, the study identified patterns and trends as opposed to establishing causality.

Artificial intelligence-assisted applications such as ChatGPT, ChatPDF, and QuillBot were used in the drafting of this document. They were only used to correct grammar issues and enhance formatting, clarity, and readability. The content, analysis and interpretations, and final conclusions included in this paper are the work of the author. The author read and edited the entire paper as prepared for submission and accepts responsibility for its accuracy and authenticity.

4 RESULTS

4.1 AI technologies for feedback analysis

Guest feedback analysis using artificial intelligence technologies has been explored extensively by researchers and companies and documented in cases in various formats. In all these areas of study, it appears that AI technology is being used to transform unstructured guest feedback into actionable insights to help monitor and improve the quality of services provided to guests.

The most common application of AI technology used in hotel guest feedback analysis is sentiment analysis. Sentiment analysis enables hotels to classify guest feedback as positive, negative, or neutral and to measure the level of guest satisfaction at different points in time. Hotels have started implementing more complex sentiment analysis systems capable of outputting a sentiment polarity and intensity score, allowing the system to detect negative comments left by customers online. This information can then be used to prioritize problems and help management decide when to implement service recovery efforts [21], [3].

Additionally, the literature indicates that many researchers and companies consider aspect-based sentiment analysis to be an important method to evaluate the level of service provided to guests. Aspect-based sentiment analysis enables hotels to connect specific guest comments to specific aspects of their services, such as cleanliness, staff behavior, food quality, or value for money. Researchers have noted that aspect-based sentiment analysis provides hotels with more actionable and useful information about their services than overall sentiment scores alone [22].

Unsupervised machine learning techniques like topic modeling have been reported to enable hotels to identify recurring topics in guest feedback that do not fall into pre-defined categories. Topic modeling enables hotels to identify potential service issues that may not have been identified through standard survey mechanisms or traditional performance measures [23].

Studies have also identified that there is a high volume of unstructured data within online reviews for hotels to process and analyze, rendering manual review response processes untenable at scale [24]. The collective evidence presented by these investigations suggests that the implementation of fully or partially automated review-response systems may provide hospitality establishments with the capacity to deal

with guest feedback with greater promptness and at a higher frequency. Together, these studies suggest that automatic or semi-automatic review response technology could enable hotels to respond to reviews both more quickly and with greater frequency, particularly during times when high volumes of reviews are received.

4.2 Mobile platform integration patterns

Three categories of mobile platform integration were observed across the included studies. Each category reflects different levels of technical sophistication and integration at the organizational level.

One category of mobile platform integration is identified as mobile applications that operate independently of other technology. Standalone mobile feedback applications were more prevalent among independent hotels. Although standalone applications allow hotels to collect feedback digitally, the inability to integrate these systems with other operational software can slow response times to feedback and limit opportunities for automation [25].

Integrated mobile feedback systems were described as the second category of mobile platform integration. Integrated mobile applications refer to systems that connect to a property's PMS or CRM system. By connecting guest feedback with the guest's profile and routing processes, integrated mobile feedback systems allow hotels to respond more quickly to service recovery incidents and collaborate across departments [26].

Pattern three encompasses complete feedback ecosystems. This approach is less common and more frequently utilized by larger or technologically mature hotels. In a feedback ecosystem, guest insights are incorporated into CRM and back-end systems. This allows for real-time sentiment scoring, automated notifications, and triggered service recovery workflows to allow for proactive management of the guest experience end-to-end [25], [26], [27].

4.3 Service quality improvement outcomes

Across the reviewed literature, AI-enabled guest feedback systems were most often associated with enhancements in response time and service recovery effectiveness. The enabling of real-time feedback gathering through mobile devices allows hotels to identify service breakdown during the guest's stay as opposed to post-checkout identification, which improves the opportunity for in-stay service recovery [28].

Improvements in online reputation management were also reported in multiple studies. Although establishing a direct causal relationship between the two is challenging, ongoing monitoring of guest feedback and responding promptly to guest feedback were correlated to better reputation metrics and improving review performance over time [29]. The effectiveness of mobile feedback channels is further supported by empirical findings that smartphone-based interactive technologies foster a higher level of engagement and provide an affordable way of nurturing customer relationships. Real-time communication capabilities are especially useful to help improve rapid recovery of service and customer satisfaction [30].

Only a few studies specifically investigated financial implications, and those studies indicated that resolving complaints effectively and enhancing the responsiveness of hotels' services can lead to higher levels of guest loyalty and repeat visitation [29].

4.4 Contextual and implementation considerations

There are several contextual considerations that impact the effectiveness of AI-enabled guest feedback systems. These include multilingual guest profiles, differing cultural perspectives of how to express feedback, and the varying expectations of guests regarding response tone and timing.

For example, hotels located in international or multicultural environments may encounter additional challenges related to language processing and interpreting sentiments due to differences in guest cultures. For instance, researchers indicate that AI systems that are primarily trained on Western data sets may interpret indirect feedback expressions and culturally based expressions incorrectly unless they have been adapted appropriately [31].

Successful implementation across regions was consistently tied to the organization's preparedness for AI-enabled feedback systems, staff training, and the use of hybrid approaches that integrate AI-generated insights with human judgment. AI-enabled feedback systems were not intended to replace human judgment and were most effective when used as decision-support tools that enhance service responsiveness and operational awareness.

5 DISCUSSION

Automated sentiment analysis enables hotels to practice less reactive and more agile approaches to managing guest satisfaction. Themes from articles reviewed revealed that automated guest feedback analysis is typically introduced as a component of larger digitalization efforts centered around service recovery, managerial decision-making assistance, and guest communications.

Sentiment analysis capabilities were present in the greatest number of studies, suggesting AI implementation in hotels has increased incrementally. Emerging research into generative applications of AI in the tourism sector shows great promise for augmenting personalization and operational efficiency in guest feedback systems; the implications of these findings are that the ways hotels process and respond to guest comments may change in the future in ways that are yet to be seen [32]. Feedback data is beginning to be utilized by hotels in a more actionable capacity rather than strictly for awareness monitoring purposes.

Response time was determined to have a strong influence on guest expectations of service recovery. Previous experimental studies show that faster managerial responses lead to higher perceived responsiveness and concern, independent of response content [33]. Real-time guest feedback allowed hotels to resolve service failures while guests were still on property.

Guests who speak multiple languages present an additional barrier to automated feedback analysis, as linguistic nuances influence review sentiment. One study found that AI models trained on both language-specific and culture-specific datasets performed better than machine translation when predicting review sentiment [34]. Guest reviews were impacted not only by the language guests choose to write in but also by cultural standards.

Hotel guest feedback analysis was present in all studies reviewed; however, there were varying degrees of sophistication. Hotels with less digital maturity utilized review aggregator tools that pulled in reviews from third-party websites, while hotels with higher digital maturity had real-time guest feedback programs in place.

Although automating feedback analysis can assist hotels in managing guest satisfaction, automation does not always result in positive change. Studies have found that sending automated responses reduced how sincere responses were perceived to be, emphasizing the need to allow hospitality employees to leverage AI tools rather than be replaced by them.

6 CONCLUSION

The purpose of this study was to synthesize current applications of artificial intelligence-enabled guest feedback tools being used throughout the hotel industry. To answer the research question, this study completed a qualitative review of academic literature, white papers, and available hotel guest feedback case studies. Results of this study indicated that AI-enabled guest feedback systems are being used to collect feedback at an increased speed and scale, allowing properties to manage and analyze guest feedback data and respond to service failures more quickly and consistently.

Applications of AI technology discussed in this paper fell into four categories: sentiment analysis, aspect-based sentiment analysis, topic extraction, and automated response generation. Case studies demonstrated these tools can be used to identify patterns in feedback across a hotel or brand, pull insights around specific aspects of the guest experience, and decrease response times by implementing solutions that allow for real-time and mobile guest feedback.

Findings also highlighted that implementation could become less effective if there is high language variability, cultural differences in how guests may leave feedback, or guest expectations of when they should receive a response. AI solutions should therefore be carefully tailored to a hotel's language, positioning, and existing guest communication standards.

Other notable trends identified during this study included an increased use of AI response generation, the ability to process more languages, and the prevention of potential guest dissatisfaction. This study concurs with past research that AI tools should be used to support decision-making and service, not replace them entirely.

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