

## **Exploring the Impact of Self-service Technologies on Customer Sentiment in the Travel, Tourism and Hospitality services**

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### **Abstract**

Self-service technologies (SSTs) have not only advanced the fields of information and communication but also revolutionized service delivery to tourists. Self-service technologies (SSTs) are technological interfaces that enable customers to access services without needing direct interaction with a service firm employee. These innovative solutions offer speed (saving time, flexible hours) and convenience to costumers, while also reducing costs and boosting productivity and profitability for firms. After a review of the literature, an analysis of guest comments has been utilized. For this study, we utilized the Yelp dataset, a valuable resource for researchers examining various aspects of the Travel, Tourism and Hospitality services (TTHS). The findings are organized around two key research areas based on sentiment analysis derived from reviews: (1) identifying how factors related to SSTs drive positive or negative sentiment, and (2) examining how SSTs impact customer sentiment across service categories within TTHS. The short paper ends with a first discussion around the need to refining the ordering experience, ensuring that both automated and personalized services function smoothly and meet customer expectations.

**Keyword:** Self Service Technology; Customer experience; Human-machine interaction; Service excellence; Travel, Tourism and Hospitality services

### **1. INTRODUCTION**

In TTHS a growing number of operators is utilizing different SSTs both to enhance customer service and to create operational efficiencies (Oliveira et al., 2021). SSTs are high-tech and 'low-touch' interfaces and refer to an array of customer-facing technology solutions designed to facilitate convenient, accurate, and speedy transactions via digital interfaces (Kim and Chen, 2023). They are defined as "technological interfaces that enable customers to produce a service independent of direct service employee involvement" (Meuter et al., 2000, p. 50) and allow customers to serve themselves using technological interfaces without direct assistance (Meuter et al., 2000). Consumer receives improved experience, convenience, ease of use, increased customization and reduced waiting time, while service providers benefit from

greater control over service delivery, service standardization, smooth demand fluctuation, reduced labor costs and expanded opportunities for deliveries (Considine and Cormican, 2017). Despite the various benefits that can be generated from the use of SST, organizations must also be cautious of potential drawbacks due to the risk of customer service depersonalization (Kaushik and Rahman, 2017). Excessive reliance on advanced technology and poor service design can create the perception that technology surpasses customer abilities, negatively impacting satisfaction (Lee et al., 2023). Additionally, when SST fails at simple tasks and requires frequent personnel assistance, the perceived value of the service may decrease, leading to increased labor costs (Hilton et al., 2013). Despite their operational advantages, SSTs may be perceived as limited in their abilities to foster interpersonal connections and enhance the overall service experience when compared to human staff (Liu and Hung, 2022). As service excellence becomes increasingly important, there is a need to explore the hedonic potential of SSTs in TTHS settings (Shin and Perdue, 2019). While companies often claim adherence to 'service excellence', customers now expect this standard from TTHS providers. The specific impact of SSTs on achieving service excellence has not been thoroughly examined. This study aims to fill this gap and deepen our understanding of service excellence through the use and adoption of SSTs. It investigates the value of various SST types and their profound effects on customer-firm interactions, leading to positive service outcomes such as customer satisfaction, loyalty, and behavioral intentions. The study is organized to give answer to these research questions: a) What factors related to SSTs drive the positive or negative sentiment expressed in customer reviews in the TTHS sector? b) How do SSTs influence customer sentiment across different service categories within TTHS?

## **2. SERVICE EXCELLENCE AND SSTs**

In the eyes of guests, service excellence simply means that it is easy to experience and enjoy services and does not automatically expect surprises in any way. Therefore, Tsaur and Yen (2019) maintain that service excellence is a 'must-have' factor in creating guest delight and ensuring business sustainability. It is defined as a guest's positive evaluation of a service provider's ability to deliver service beyond expectations (Alan et al., 2016). The service encounter is the most critical venue for realizing service excellence and creating a 'wow' experience. This encounter refers to the interaction between service providers and customers. In this context, SSTs are one of the most successful servers in the delivery system. They can operate either alongside personnel or independently, offering tourists a combination of high-tech efficiency and high-touch personalization. SSTs differentiate between merely providing service in the frontstage and co-creating an unforgettable wow experience (Kim and Chen, 2023). The quality of SST encounters with customers determines the overall experience quality, leading to positive word of mouth and customer retention (Neuhofer et al., 2013). It is crucial to understand the origins of customer satisfaction or dissatisfaction with SSTs. Meuter et al. (2000) argued that SSTs fulfill customers' intensified needs and offer better alternatives, leading to greater satisfaction. Dissatisfaction, on the other hand, arises from poor design and malfunctioning technology, among other factors. Collier and Kimes (2013) found that convenience can boost customer satisfaction and

trust, while Lin and Hsieh (2006) discovered that satisfied consumers are more likely to use SSTs, which in turn reduces their contact with service staff.

### 3. METHODOLOGY

We utilized the Yelp dataset, a valuable resource for researchers examining various aspects of the TTHS (Ching and Bulos, 2019). The dataset provides a wealth of customer reviews, offering insights into how customers perceive and interact with commercial activities (Hegde et al., 2017). The Yelp dataset offers a comprehensive collection of user-generated reviews for various TTHS, including hotels and restaurants, covering aspects such as service quality and overall satisfaction (Yelp Dataset JSON: Documentation, 2024). Sourced from Kaggle, it contains over 6.9 million reviews from around 150,000 businesses, making it an ideal resource for analyzing trends in the hospitality industry (Yelp Complete Open Dataset, 2024). The dataset is well-structured, comprising JSON files with business, review, user, and tip data, which makes it a valuable tool for studying customer interactions with self-service technologies. Our analytical strategy for this study involved two key components: zero-shot categorization, sentiment analysis and content analysis, designed to systematically assess and categorize customer feedback related to SSTs within the TTHS. Recognizing that customer sentiment in reviews often reflects underlying satisfaction levels, we employed sentiment analysis as a proxy for customer satisfaction, following the methodologies established by Liu (2012) and Pang and Lee (2008). Due to the large size of the Yelp dataset, it was organized in MongoDB, which supports the structure of the original files. The database was queried to identify keywords related to SSTs in TTHS. Regular expressions were used to search for keywords in reviews and tips, resulting in a CSV file with nearly 15,000 rows. After initial filtering, a zero-shot classification model, *facebook/bart-large-mnli* from Hugging Face, was used to determine if the review text related to SST in TTHS (Puri et al., 2019). Sentiment analysis was also performed using the *cardiffnlp/twitter-roberta-base-sentiment* model, categorizing text as positive, neutral, or negative (Barbieri et al, 2020). We filtered out common words between positive and negative sentiments, focusing on unique terms to enhance WordCloud clarity. This approach, grounded in TF-IDF (Ramos, 2003), highlighted the most informative, sentiment-specific words. We also analyzed customer reviews pertaining to various technologies employed in TTHS. While reviews covered a range of technologies, the most substantial data was obtained for two specific ones: robots and touchscreens. Through content analysis (Krippendorff, 2018), the review data was processed to extract relevant categories and subdivide into individual entries. Reviews mentioning these two target technologies were then filtered, categorized by sentiment, and analyzed. Key metrics, including the percentage of positive and negative sentiment, the ratio between them, and the number of businesses utilizing the technologies, were calculated to ensure an accurate analysis and avoid distortion from isolated cases.

### 4. FINDINGS

#### 4.1 Reviews related to SST

Word clouds for positive and negative sentiment reveal distinct patterns in customer perceptions of TTHS. Positive sentiment is associated with key stages of the customer journey, such as payment processes, order delivery, ordering, and customization. Descriptors like “clear,” “streamlined,” “efficient,” “easy,” “intuitive,” “relaxing,” and “fun” frequently appear, indicating a generally satisfying and enjoyable user experience. The prominence of “clear” highlights the importance customers place on transparent, easy-to-navigate interfaces that reduce confusion and enhance confidence. The term “choice” also stands out, reflecting the significance of offering diverse options that allow customers to personalize their experiences and increase satisfaction. On the other hand, reviews with negative sentiment are dominated by terms like “annoying,” “issue,” “confusing,” “rushed,” and “canceled,” signaling the frustration users feel when these technologies fall short. The lack of clarity and limited choices in these negative experiences further underscore the critical role these elements play in shaping positive customer perceptions. This contrast emphasizes the necessity for TTHS systems to operate flawlessly, providing clear interfaces and ample choices to ensure high levels of customer satisfaction and trust.

#### ***4.2 Customer satisfaction across service categories***

Based on the results, touchscreens have been broadly adopted and are well-received across various TTHS. In restaurants, where 234 establishments have implemented touchscreens, the technology garners 91.1% positive sentiment, highlighting its effectiveness in settings where operational efficiency is crucial. In more specialized sectors, such as vegan and vegetarian restaurants, touchscreens continue to receive strong positive feedback, with 91.6% and 90.9% positive sentiment, respectively. This successful integration across diverse TTHS demonstrates the versatility of touchscreens in meeting varied customer preferences, especially those centered on health, convenience, and personalization. Additionally, in the Burgers category, with 42 establishments, the technology also enjoys a high percentage of positive sentiment, further underscoring its broad appeal across different TTH settings. The consistently positive feedback, regardless of the scale of adoption, emphasizes the universal value placed on touchscreens’ key features, such as clarity, efficiency, and customization. Robotic technologies present a more nuanced scenario, particularly in restaurant settings, where 82.9% of sentiment is positive among 38 establishments, but 17.1% negative sentiment highlights challenges in delivering personalized and clear service. The smaller number of businesses adopting robots, compared to touchscreens, suggests that this technology is still in its early stages of adoption, possibly due to higher complexity, cost, and the risk of negative customer experiences if the technology fails to perform flawlessly. In hotels, where there are only six establishments that have adopted robotic technologies, positive sentiment decreases to 71.4%, with a notable proportion of negative feedback. This reflects the challenges robots face in delivering the personalized, high-touch service expected in hospitality, particularly in more intimate environments like hotels.

## **4. PRELIMINARY CONCLUSIONS**

The word clouds analysis reveals that clarity, ease of use, and customization are key drivers of customer sentiment towards SSTs. Positive sentiment is linked to intuitive interfaces, while negative sentiment stems from confusion and operational issues, addressing the first research question on what drives sentiment in SST interactions. For the second research question, SSTs like touchscreens receive favorable sentiment, especially in contexts valuing efficiency and customization. In contrast, robots, still emerging, evoke mixed sentiment, particularly in service-focused settings like hotels. This suggests that the impact of SSTs on sentiment varies across different service categories. The sentiment matrix further emphasizes the importance of aligning technology adoption with customer preferences, highlighting areas where customer satisfaction, as reflected through sentiment, may currently lag.

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