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## **Key Attributes of Mobile Apps for Halal Tourism: An Analysis of Online Reviews Using Leximancer**

### **Abstract**

**Purpose** – With the continued relevance of mobile apps to manage travel experiences and the rise in tech-savvy halal travel markets, there is an urgent need to identify the major attributes valued by consumers of mobile apps catered for halal tourism. This study aims to identify the key service quality attributes of halal tourism mobile apps.

**Design/methodology/approach** – A content analysis of 279 user comments from a leading mobile app catered to Muslim travelers was done using Leximancer.

**Findings** – 11 themes were uncovered from the analysis and found to be salient for users of mobile apps for halal tourism. Nine key themes – “app”, “prayer”, “halal”, “work”, “Muslim”, “useful”, “fix”, “open” and “reply” – were related to the service quality dimensions while two themes – “gratitude” and “reward” – reflect the consequences of using a high-quality halal tourism mobile app service. Results also showed that users had generally positive attitudes towards the app.

**Practical implications** – Our findings provide tourism managers with critical design considerations to develop and benchmark mobile apps that can serve the travel needs of halal markets.

**Originality/value** – This study is among the first to explore the perceived service quality dimensions valued by halal markets in the context of mobile apps catered to their travel needs. The findings of this study advance the literature of how service quality dimensions can differ in new service environments, with our context intersecting faith- and mobile-based tourism services. Our study also offers managerial insights on improving the mobile app service experiences of Muslim travelers by optimizing the themes uncovered.

**Keywords:** service quality, halal tourism, Muslim-friendly travel, mobile app, online reviews, Leximancer

## 1. Introduction

The global adoption of mobile apps continues to rise and is becoming a dominant trend in digital media consumption. On average, users worldwide spend several hours daily on apps, primarily for social media, gaming, entertainment, and communication (Statista, 2025). In 2023, Indonesia led global app usage, with users spending over six hours daily on mobile apps, followed by Thailand at 5.54 hours, while Australia recorded the lowest daily usage at 3.35 hours (Statista, 2024). Consumer spending on mobile apps reached approximately \$171 billion in 2023 (Statista, 2024). This trend continued into 2024, with 25.6 billion downloads on Google Play and 8.4 billion on the Apple App Store in the first quarter alone, reflecting the growing reliance on mobile apps (Statista, 2024). This growth is driven by the widespread adoption of smartphones, which are used by 5.75 billion people, representing 70.3% of the global population, and smartphones account for over 85% of these devices (We Are Social, 2024).

Similarly, the halal tourism industry is rapidly expanding, driven by the growing number of Muslim travelers and their specific needs. The global Muslim population, projected to reach 2.3 billion by 2030, represents an emerging market for halal tourism (CrescentRating, 2023). According to the Global Muslim Travel Index (GMTI) 2023, the halal travel market is expected to reach 230 million international arrivals by 2028, with expenditures estimated at \$225 billion. This growth is evidenced by the fact that over 2,000 hotels worldwide now provide halal-friendly accommodations, highlighting the sector's increasing economic significance (CrescentRating, 2023). Muslim travelers seek destinations that align with their cultural and religious values, making halal tourism a key driver for economic growth and cross-cultural understanding. Leading countries like Malaysia, Indonesia, Turkey, and the UAE are at the forefront of offering halal-certified services, while non-Muslim-majority countries such as Japan, Australia, and New Zealand are also adapting by providing halal food and prayer spaces (Han et al., 2019; Rashid et al., 2020). In 2023, Malaysia recorded 4.5 million Muslim tourist arrivals, generating RM14.7 billion in revenue. (The Sun, 2024).

Halal tourism, initially referred to as "Islamic tourism" (Henderson, 2009), was first introduced in tourism literature as "Halal tourism" by Battour et al. (2010). More recently, Battour et al. (2022) redefined halal tourism as any tourism experience that complies with Islamic teachings while catering to the specific needs of Muslim travelers. These needs include halal food, alcohol-free accommodations, prayer facilities, gender-segregated amenities, and Islamic leisure options (Battour et al., 2012; Moshin et al., 2020). Halal tourism encompasses various related concepts, such as halal/Muslim travel, Muslim-friendly tourism, and halal-friendly destinations (Abror et al., 2020; Han et al., 2019; Yagmur et al., 2019). Research by Suban et al. (2021) highlights the top five subject areas related to halal tourism are business, management, and accounting; social sciences; environmental sciences; economics, econometrics, and finance; and computer science.

Indeed, the rise of information technology (IT) has revolutionized the tourism industry, improving the accessibility and dissemination of travel information (Yin et al., 2019). Emerging technologies such as smartphones, wearable devices, artificial intelligence (AI), and big data analytics (Lee et al., 2018; Xiang, 2018) are playing an increasingly vital role in shaping the future of halal tourism. Digital platforms, such as mobile apps and social networks, enable travelers to share experiences through videos, photos, and reviews (Litvin & Dowling, 2018; Yu et al., 2017). The demand for unbiased travel information has boosted the popularity

of online review platforms, which significantly influence travel decisions and are widely used for research (Yu et al., 2017; Litvin & Dowling, 2018). This growing demand for Muslim-friendly travel apps presents significant opportunities for developers and travel companies to engage this digitally active and culturally conscious market.

Notably, while service quality research has clarified our understanding of the customer expectations of mobile apps in general (Huang et al., 2015) as well as tourism apps (Anand et al., 2023), to the best of our knowledge, there has yet to be a study investigating the service quality expectations of tourism apps that are valued by halal markets. While Khan and Shambour (2018) make a positive contribution to the literature, their study focused on the mobile service quality of apps specific to Hajj and Umrah services and not on general travel by halal markets. As the service quality literature suggests that different service environments can result in different service quality evaluations from customers (Rust & Oliver, 1994), the need to investigate the validity of this theory in the context of faith- and mobile-based tourism service environment remains. Practically, such findings will also allow managers to better design mobile apps for their halal markets that can become more satisfied and loyal with higher quality halal tourism services (Noor, 2025). Therefore, to address these gaps, this study aims to answer the following research question: What are the key service quality attributes perceived by consumers of mobile apps that cater to their Muslim-friendly travel needs?

To the best of our knowledge, this study is among the first to explore the perceived service quality dimensions of halal tourism mobile apps. Our content analysis of 279 user comments reveals nine key service quality dimensions and two service quality outcomes associated with halal tourism mobile apps. This study advances the literature on service quality and halal tourism and provides managerial insights on optimizing mobile app design for the halal tourism sector.

The next section describes the background of service quality and mobile app performance in the halal tourism context. This paper then proceeds to explain the methodology before discussing the findings of our study. The study concludes with the theoretical and managerial implications of our research as well as areas for further research.

## **2. Literature review**

Service quality refers to how well a service meets or exceeds customer expectations (Parasuraman et al., 1988). Early models that were developed to define and assess service quality include the two-dimensional technical and functional quality model by Grönroos (1984) and the widely used SERVQUAL (Parasuraman et al., 1991; Parasuraman et al., 1988) which evaluates the five dimensions of reliability, responsiveness, empathy, assurance, and tangibles. Brady and Cronin Jr (2001) broadened the concept of service quality as consisting of interaction quality (i.e., attitude, behavior, expertise), physical environment quality (i.e., ambient conditions, design, social factors), and outcome quality (i.e., waiting time, tangibles, valence).

In the context of mobile apps, following the rich tradition of scale development in the service quality literature for different service environments (Noor et al., 2021), Huang et al. (2015) adopted a deductive approach to construct a seminal scale for mobile service quality. The use of the deductive approach and extant scale constructs was deemed suitable by the

authors as there were sufficient tangential studies on mobile commerce satisfaction, loyalty, and service quality. They uncovered five relevant factors – contact, responsiveness, fulfillment, privacy, and efficiency – with privacy being more pertinent for virtual as opposed to physical product shopping in the mobile context. Focusing on the tourism sector and emerging technologies, more recently Anand et al. (2023) used the partial least squares structural equation modeling (PLS-SEM) with adapted constructs from the extant literature. PLS-SEM has become increasingly used in marketing-related studies to estimate the relationships between different constructs (Hair et al., 2024). They found that information quality, system quality, and service quality affected user satisfaction and reuse intention.

While the above studies pertain to service quality attributes in the context of the mobile environment and tourism, the question of how halal tourism would affect the service quality dimensions remains. Generic service quality models may not fully capture the influence of cultural and religious factors (Battour et al., 2014; Noor, 2025). Service expectations are shaped by context, including religion, which is particularly relevant for Muslim consumers. As the world's second-largest religion (PewResearchCenter, 2017), Islam has distinct requirements that influence service experiences (Noor, 2022). Standard models may overlook key Islamic attributes, making it essential for tourism and hospitality businesses to incorporate halal service quality dimensions. Addressing these cultural and religious needs is critical to enhancing service quality and meeting customer expectations in halal tourism.

In response, Khan and Shambour (2018) conducted a mixed-method study on mobile applications for Muslims and adopted the MARS service quality evaluation model encompassing four categories to assess the quality of apps – engagement, functionality, aesthetics, and information quality. However, their study was designed for the specific religious travel of Hajj and Umrah services. Separately, Arasli et al. (2023) conducted a content analysis of online reviews of Muslim-friendly hotels from the travel website booking.com. Their findings revealed that hotel, staff, food, room, location, pool, facilities, cleanliness, and Wi-Fi were the service qualities most discussed by online consumers. Thus, while the studies by Khan and Shambour (2018) and Arasli et al. (2023) are notable contributions to the literature, neither examined service quality in the context of mobile apps designed for general halal tourism.

Overall, there is continued attention in the literature in the areas of mobile app design (Baran and Barutçu, 2025), tourism (Ratnasari et al., 2024), and service quality in halal industries. In a recent systematic review of service quality studies in halal industries, Noor (2025) identified that a greater diversification of industries beyond Islamic finance was required in service quality research. The study also highlighted a lack of service quality studies done in the context of mobile apps. Hence, this research answers the call for a greater examination of service quality in the fields of halal tourism and mobile apps. Table 1 summarizes the contribution of our study compared to the extant selected literature as discussed in this section.

Table 1. Comparison of selected seminal studies with the current study contribution

Study	Scale methodology	Service quality dimensions	Service Quality Context		
			Halal	Tourism	Mobile App
Huang et al. (2015)	Scale development	Contact, responsiveness, fulfillment, privacy, efficiency			✓

Anand et al. (2023)	Adopted extant constructs from the literature	Information quality, system quality, service quality		✓	✓
Khan and Shambour (2018)	Adopted extant constructs from the literature	Engagement, functionality, aesthetics, information, subjective quality	✓ (Haji & Umrah Only)	✓	✓
Arasli et al. (2023)	Content analysis of online reviews from a travel website using Leximancer	Hotel, staff, food, room, location, pool, facilities, cleanliness, Wi-Fi	✓	✓	
Our study	Content analysis of online reviews from a Google Play app using Leximancer	App, prayer, halal, work, Muslim, useful, gratitude, fix, reward, open, reply	✓	✓	✓

Source: Created by the authors

The next section explains the research methodology undertaken in our study using content analysis with the aid of Leximancer.

### 3. Methodology

#### 3.1 Data source and collection

To identify the key service quality themes of mobile apps designed for halal markets, we gathered data from online customer reviews of the HalalTrip app. The HalalTrip app stands out as a leading platform for Muslim travelers, offering features such as halal restaurant and prayer facility locators, travel guides, and in-flight prayer time calculators (HalalTrip, 2023). Managed by HalalTrip and acquired by CrescentRating, a leading authority on halal travel (WiT, 2013), the app benefits from a substantial download volume on Google Play with over 100,000 downloads. This extensive user base ensures a rich and diverse collection of reviews, providing robust insights into consumer experiences and perceptions.

The Google Play store was used for the collection of online reviews. Online reviews from Google Play have been successfully employed in previous service quality studies across multiple service sectors with technological contexts including lifestyle apps (Byun et al., 2023) and Islamic digital banking (Timur et al., 2024). In our study, a total of 279 English online reviews were collected up to January 2025.

In terms of the structure and process of the text dataset for analysis, the 279 online reviews collected were separated by paragraphs, with some paragraphs containing only one sentence based on the length of the comment given by the user. Proofing was done by the co-authors, in which the dataset was deemed to be of appropriate quality for analysis. The subsequent analysis of these reviews was done using Leximancer's default settings, which involved automatic text processing and concept seed generation before the final output (Haynes et al., 2019). This analysis process using Leximancer will be further elaborated in the next section.

#### 3.2 Data analysis through Leximancer

Leximancer is a computer-assisted qualitative data analysis software that employs advanced machine learning and natural language processing techniques to automatically extract,

quantify, and visually represent key themes and concepts from unstructured text (Crofts & Bisman, 2010). Leximancer unlocks the value of unstructured online consumer reviews (Robson et al., 2013) by systematically extracting key themes and concepts through relative frequency and co-occurrence analysis. This process transforms raw, unstructured reviews into organized insights, helping researchers identify distinct product strengths and weaknesses while enabling the industry to make informed decisions. Studies have also highlighted the benefits of Leximancer in mobile app reviews (Kim and Kim, 2017). Further, Leximancer has proven its worth in hospitality and tourism research (Olorunsola et al., 2023), including studies on halal travel (Arasli et al., 2023).

Accordingly, a thematic content analysis was conducted using Leximancer to identify key concepts from the keywords, which were then aggregated into higher-order themes based on their level of connectedness (Goh & Wilk, 2022). The reliability of the analysis was ensured by using Leximancer's built-in quality checks, which reduce the potential for bias and errors in manual coding (Smuts & Van Der Merwe, 2022). Concepts were color-coded based on their frequency and significance. A visual concept map containing these themes was produced and will be elaborated in the following section.

#### 4. Results

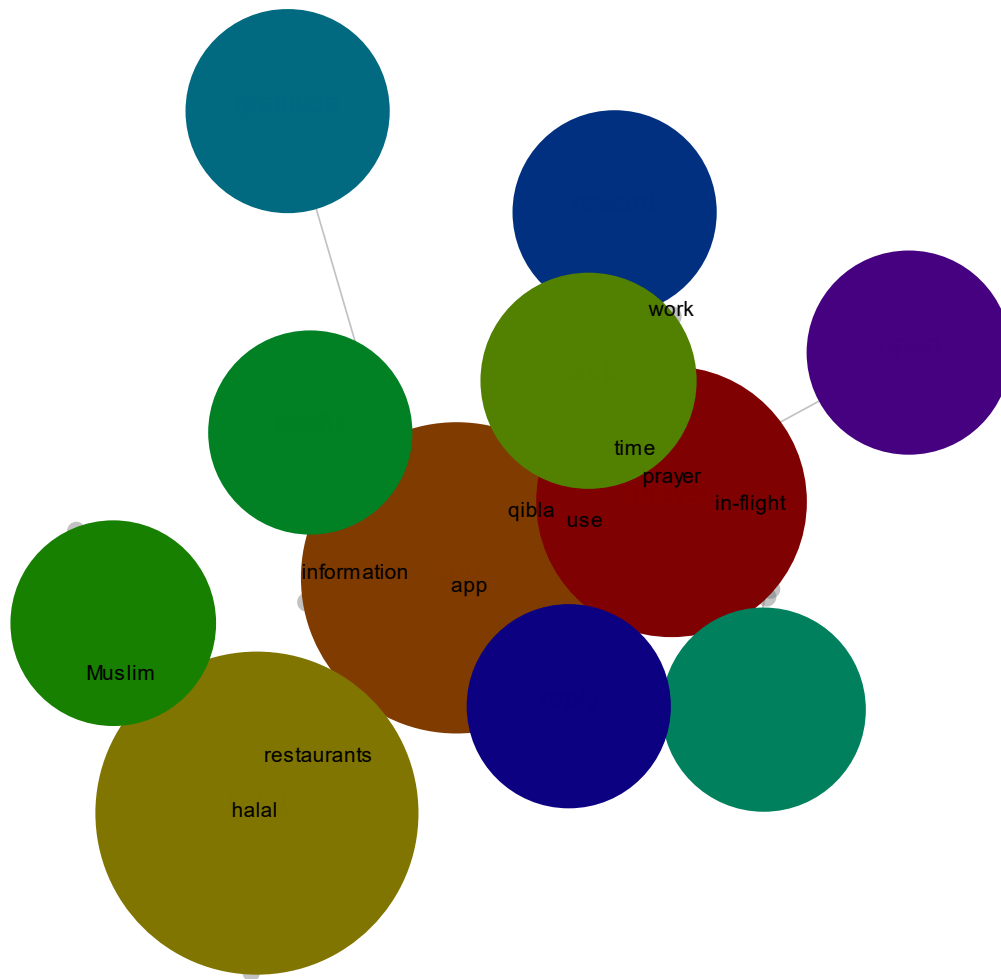
A total of 11 themes salient to the key attributes of mobile apps for halal tourism were established. Table 2 shows the significance of the connectivity recorded while Figure 1 illustrates the concept map created by Leximancer.

Table 2. Leximancer concept frequencies

Concept	Frequencies	%
app	144	100
prayer	82	57
halal	52	36
work	48	33
Muslim	31	22
useful	26	18
gratitude	20	14
fix	10	7
reward	9	6
open	4	3
reply	3	2

Source: Created by the authors

Figure 1. Concept map of halal tourism mobile app reviews



Source: Created by the authors

#### 4.1 Users' evaluations of halal tourism mobile app

##### 4.1.1 App

The theme “app” was the most prominent in this study. This theme includes the concepts of “access” (71%), “information” (50%), “travel” (50%), “nearby” (50%), “need” (43%), “unable” (33%), “start” (33%) and “qibla” (29%). Several users shared the following reviews related to a variety of different functionality features of the app:

“Explain the permissions needed for this app. Allowing only GPS access causes the app to hang at the start screen.”

“I’m unable to use the app because I denied it from accessing my camera and files! Why would you need this kind of access!”



“It’s a good start! But was unable to locate any halal restaurants in my area even though there are many in the area.”

Functionality, including the ability to perform the service smoothly with clear processes, is a key service quality dimension for self-service technologies such as mobile apps (Lin & Hsieh, 2011). Our theme also reflects the importance of the functionality of the mobile app for Muslim travelers who expect the app to perform well and be easy to use (Khan & Shambour, 2018).

#### *4.1.2 Prayer*

The second most significant theme in the reviews was “prayer” and includes the concepts of “in-flight” (82%), “time” (63%), “website” (40%), “pm” (33%), “use” (22%), “camera (20%)” and “phone (20%)”. Reviews left by mobile app users included the following:

“I love this app and still use it, especially for in-flight prayer time. Please check the app. It shows on 8<sup>th</sup> Oct 2020, time at origin: Isha prayer time (before departure) for Riyadh is at 6.45 pm.”

“Why are the in-flight calculations not working? I even tried it on the website and it’s still not working.”

The significance of the prayer theme is not only related to the prayer timings but includes the prayer direction or qibla, as expressed by one user who proposed an alternative:

“Okay whoever wants an accurate reading for qibla, just use Qibla Finder by Google. It’s a website but you will only be able to use it on a phone since it requires a gyro sensor, camera, and GPS.”

The expectations of Muslim travelers to be able to find prayer facilities such as mosques, prayer times, and qibla directions using their halal tourism mobile apps are in line with the key Islamic attributes of the destination which are significant for these halal markets (Battour et al., 2014).

#### *4.1.3 Halal*

“Halal” was the third most significant theme and was mainly related to halal food. The theme included the concepts of “restaurants” (100%), “food” (73%), and “trip” (13%). Users emphasized the importance of the mobile app to comprehensively deliver information related to nearby halal restaurants:

“But unfortunately, the halal restaurant list is pretty bad and the food guide is not good as very few restaurants are listed.”

“I was in Truxillo St. It provided only one option for halal food while Yelp provided more than five.”

This theme resonates with the importance of being able to find halal food when using online channels to facilitate trip planning (Arasli et al., 2023). Beyond mere compliance with the faith-based needs of Muslim travelers, the illustrative quotes in this theme also support the increasing

importance of a halal tourism mobile app to offer a diverse range of halal food options to meet the appetite of different halal markets (CrescentRating, 2024).

#### *4.1.4 Work*

The fourth theme was “work” and encompassed the concepts of “saying” (22%), “needs” (13%), “used” (13%), and “flight” (9%). App users emphasized the importance of the usability of the mobile app and its ability to clearly notify users of the status of the app when in use:

“It keeps saying sync is in progress. Secondly, I even reinstalled it still didn’t work.”

“In-flight prayer times does not work. Keeps saying invalid flight time.”

The ability of the halal tourism mobile app to work is a key feature that reflects the importance of the system quality of such mobile apps designed for tourism (Anand et al., 2023).

#### *4.1.5 Muslim*

The fifth theme “Muslim” consisted of the following concepts: “helpful” (25%) and “Alhamdulillah” (14%). Mobile app users expressed that the app was a helpful travel solution, particularly for the Muslim travel market:

“Alhamdulillah, very helpful and useful.”

“One of the greatest ideas for an app ever! Very helpful, thank you!”

“I found this app service very useful whenever I traveled to any non-Muslim area. Nearby halal restaurants, and mosque information are really helpful for Muslim people.”

Similar to the importance of Islamic attributes for destinations (Battour et al., 2014), our Muslim theme reflects how Muslim travelers value a mobile app that caters to their Muslim identity and their various faith-based needs.

#### *4.1.6 Useful*

The sixth theme “useful” included the concept of “traveling” (20%). Users commented on the following:

“The app is awesome. I found it very useful when I was traveling via Thailand. I was stuck not seeing any masjid but this app helped me find a mosque nearby.”

“Used during recent foreign trips for prayer times and qibla direction. Very useful while traveling across time zones.”

The usefulness of a technological application as perceived by consumers has been shown to increase its adoption in multiple halal service environments (Noor, 2024) including in the context of halal tourism mobile apps (Berakon et al., 2023). Similar to Yang et al. (2005) in the

context of web portals, in our study, usefulness is also captured as an expectation that consumers have of their halal tourism mobile apps.

#### *4.1.7 Gratitude*

The seventh theme “Gratitude” encompassed the concept of “Jazakallah” (18%) or thank you in the Arabic language. Expressions of gratitude shared by mobile app users included the following:

“Jazakallah khairan.”

“I always use this app when traveling overseas to find out the correct timings of namaz. Thank you.”

Gratitude reflects an outcome theme and emerges as a result of using a halal tourism mobile app that is of good service quality. Through the mobile app and its high level of service quality, such expressions of gratitude from the Muslim traveler to the service provider can create a warm service environment and contribute to joint efforts in creating value and a better service experience (Abror et al., 2023).

#### *4.1.8 Fix*

The eighth theme “fix” includes the concept of “problems” (14%). Mobile app users expressed the desire for the mobile app and its developers to be able to resolve issues encountered quickly:

“Loved the in-flight prayer time calculator. Had several occasions where there were problems with the server, contacted the developer, and got a reply and the fix really quickly.”

“Just hung on the first page. Please fix it as soon as possible.”

This theme is similar to the prominence of the separate online service recovery scale that emerged from Parasuraman et al. (2005) and highlights the importance of responsiveness in resolving the issues faced by customers when using such halal tourism mobile apps.

#### *4.1.9 Reward*

The ninth “reward” theme focused on the concept of “reward” (8%). Here, mobile app users extended their intentions in wanting the developers of the mobile app to be rewarded for the effort in creating the app:

“May Allah reward them for such a great effort”.

“Great concept! May Allah reward you and give you lots of success.”

“Great app! May Allah reward everyone involved in the creation of this app.”

Reward is also reflective of an outcome theme and is a consequence of consumers using a high-quality halal tourism mobile app. This theme is associated with consumers having an attitude

of wanting to increase the returns and benefits of the mobile app developers as a result of their delivering excellent service performance. This is similar to the concept of customer loyalty which is a key outcome factor in halal tourism (Abror et al., 2023; Battour et al., 2024).

#### *4.1.10 Open*

The tenth theme “open” consisted of the concept of “open” (4%). Mobile app users emphasized the importance of the ability to start the app and launch tasks within the app:

“Downloaded but the app wouldn’t open at all!”

“Cannot open the tabs without opening GPS which will surely exhaust the battery.”

The ability for the application to launch and not freeze is a key service requirement for mobile app users (Huang et al., 2015).

#### *4.1.11 Reply*

The final eleventh theme was “reply” and was associated with the concept of “reply” (3%). Halal tourism mobile app users expressed the following:

“Loved the in-flight prayer time calculator. Had several occasions where there were problems with the server, contacted the developer, and got a reply and the fix really quickly.”

“Thanks for the reply. I have emailed you as suggested.”

The ability to contact a human service agent is also a key attribute of mobile service quality (Huang et al., 2015). Its importance is underscored for electronic service recovery (Parasuraman et al., 2005) and remains prevalent even for services performed by AI applications (Noor et al., 2022). Thus, consumers today continue to expect the ability to interact with a human service agent when using halal tourism mobile apps.

## *4.2 Sentiment analysis*

We further ran a sentiment analysis of the reviews using Leximancer with the default Sentiment Lens settings to ascertain app users' attitudes (Ligteringen, 2025). Leximancer uses machine learning with a lexicon that contains positive and negative sentiment items to identify sentiments in our 279 text paragraphs, and is a suitable software to perform sentiment analysis on a variety of text lengths including those found in our reviews (Ma et al., 2018). With this approach, our study also contributes to the literature on the use of Leximancer to conduct sentiment analysis for hospitality and tourism studies (Mehraliyev et al., 2022).

Table 3 shows the top 10 positive and negative terms as extracted from Leximancer. The top 10 positive terms were “good”, “great”, “idea”, “accurate”, “wonderful”, “fast”, “locator”, “list”, “concept” and “areas” while the top 10 negative terms were “calculator”, “fly”, “frustrating”, “endlessly”, “occasions”, “developer”, “contacted”, “quickly”, “airport”, and “problem”. Overall scores for positive terms were higher than negative terms and indicate

that users were generally positive about their experiences with the halal tourism mobile app. Beyond the affective terms, the analysis reveals that factors associated with accuracy, speed, and listings contributed to positive experiences, while issues concerning prayer calculations, usage of the app during flights and at airports, and interactions with developers were some of the more salient factors causing negative sentiments. These insights complement the key service quality themes found in the earlier analysis and offer a more nuanced perspective on how to better manage the halal tourism mobile app. For instance, developers may wish to focus the “Fix” theme on the prayer calculator to alleviate this critical service pain point for users.

Table 3. Top 10 positive and negative sentiments of halal tourism mobile app users

Positive terms	Score	Negative terms	Score
good	8.47	calculator	5.50
great	7.75	fly	2.36
idea	5.45	frustrating	2.36
accurate	5.14	endlessly	2.36
wonderful	4.75	occasions	2.36
fast	4.21	developer	2.36
locator	4.21	contacted	2.36
list	4.21	quickly	2.36
concept	4.21	airport	2.36
areas	4.21	problem	2.36

Source: Created by the authors

## 5. Discussion and conclusions

### 5.1 Discussion

The continued relevance of mobile apps in managing halal trips for Muslim travelers necessitates that developers understand the key service quality expectations to better design such mobile apps. Through a content analysis of the rich online consumer reviews of the HalalTrip mobile app, our study is among the first to focus on the key service quality attributes of mobile apps that can manage the faith-based needs of Muslim travelers. Using Leximancer, we uncover nine key service quality themes and two associated outcomes upon using halal tourism apps of good performance, highlighting how technological performance and religious needs intersect this market.

While the findings align with known patterns in mobile service research, such as the importance of functionality and usefulness, they also uncover the unique influence of Islamic cultural values. Themes like “prayer” and “halal” are not merely technical features but reflect essential religious needs that shape user satisfaction, a dimension often overlooked by generic service models as shown in the prior studies (Battour et al., 2014; Khan & Shambour, 2018). Notably, the current conditions in the halal tourism app market still show gaps, especially in providing comprehensive halal listings and reliable features, echoing concerns highlighted in earlier studies (Arasli et al., 2023; Baran & Barutçu, 2025). These gaps suggest that while the market is growing, service providers have yet to fully operationalize the integration of cultural values into robust technological outcomes.

Compared to general tourism apps, halal apps face the additional challenge of delivering not only strong system performance but also religious accuracy and trustworthiness, requiring specialized design and continuous feedback. Typically, what works in mainstream tourism technology may not fully meet the distinct needs of halal travelers. Furthermore, user expressions of “gratitude” and “reward” reveal a deeper, value-driven relationship between users and providers, offering halal tourism companies an opportunity to strengthen customer loyalty by emphasizing shared cultural and religious values.

### *5.2 Theoretical implications*

First, our study contributes to the literature on service quality and halal tourism by providing insights into the distinct set of dimensions that contribute to the service quality of halal tourism mobile apps. The similarity of several dimensions with extant service quality measures in the context of mobile, tourism, and halal provides support to the validity of our discovered themes. For instance, “work” and “open” particularly highlight the importance of reliability in technology-based service contexts (Noor et al., 2021). By the same token, the unique combination of the nine uncovered dimensions is a useful contribution to the literature which acknowledges that different service environments would result in different service quality attributes (Zeithaml et al., 1990).

Second, the results of our study also highlight the complex phenomenon of consumer behavior and expectations when overlapped with attitudes and theoretical lenses associated with technology adoption, religion, and consumer value. For instance, “useful” is an established factor that is often discussed in the theoretical context of technology acceptance (Noor, 2024). In addition, “prayer”, “halal”, and “Muslim” strongly reflect the level of religiosity and religious identity that Muslims associate themselves with. The theme of gratitude also reflects the importance of value co-creation in halal tourism (Abror et al., 2023). Our study shows that the importance that Muslim travelers place on these factors translates into expectations that they have for mobile apps that cater to their travel needs.

Finally, our study also shows the benefits of content analysis of online customer reviews using Leximancer as a suitable and useful methodology in tourism research (Goh & Wilk, 2022). This further builds on the Islamic marketing and halal tourism literature such as Arasli et al. (2023) which features the use of such methodologies. This paper also supports the use of software in efficient content analysis, thereby unlocking the value of in-depth insights from such qualitative methods (Lim, 2024).

### *5.3 Managerial implications*

Our insights offer three key practical directions for stakeholders who intend to use mobile apps to cater to the needs of their halal tourism markets. First, the key service quality themes uncovered can serve as design specifications in the development of such apps. This ensures that management and developers can design apps based on the expectations of customers. For instance, the presence of the “reward” theme encourages mobile app developers to facilitate consumer advocacy by including design specifications such as share buttons and comments features for mobile app users. Such design investments based on actual customer expectations

reduce a key knowledge gap in service quality between management's perceptions of customer's service quality expectations and what customers really want from service providers (Parasuraman et al., 1985; Wirtz & Lovelock, 2022).

Second, these dimensions can be used to benchmark and index the different halal tourism mobile apps available in the industry. Such rankings based on the service expectations of customers can be useful for companies to measure their market performance. These indexes can be measured in greater granularity based on the order of importance of the themes as detected in our study, with the functionality of the app being a key service requirement. For consumers, the availability of such rankings enables them to make more informed mobile app choices based on the performance differences across a variety of mobile apps for halal tourism.

Third, the use of user reviews in our analysis emphasizes the importance of collecting online customer feedback and addressing customer concerns. To this, service firms catering to Muslim travelers need to ensure that multiple channels are provided to customers to give their opinions on the performance of the mobile apps. Such data capture can be valuable for companies to better understand the expectations of their customers as shown in our study. The effectiveness of measures undertaken to address consumer concerns can be assessed based on future comments and sentiments on the halal tourism mobile app.

#### *5.4 Limitations and future research*

Despite the importance of our study in filling an urgent gap in the literature to better match the state of mobile app maturity in the halal tourism industry, there are several limitations that represent areas of future research. First, only the HalalTrip app was used as a representative halal tourism app sample. Future studies can investigate the relevance of our themes against those that emerge from a content analysis of other halal tourism mobile apps with ample rich user comments.

Second, the conceptual nature of our study opens doors to further empirical research. This includes how each theme can be measured more accurately from the perspective of consumers. In addition, it is useful to validate the level of importance of each dimension as suggested in the significance percentages of our themes. These warrant the development of a suitable scale that can measure the service quality of halal tourism mobile apps.

Third, it would be useful for future studies to assess the importance and relevance of the themes uncovered in our study against the different segments of halal markets. For instance, it would be useful to examine differences in responses based on female travelers or family groups to ascertain if these segments value the service quality dimensions of halal tourism mobile apps differently.

#### *5.5 Conclusion*

While much of the existing literature emphasizes general usability, efficiency, or satisfaction, our findings reveal that in the halal tourism industry, cultural and religious alignment are not merely added features but fundamental to how users assess value. This study broadens the understanding of mobile app service quality by highlighting the distinct needs of halal tourism,

a market segment that is underrepresented in mainstream app adoption studies. Unlike general tourism applications, halal apps are distinguished by their integration of faith-based expectations with technological performance, requiring adherence to strict religious and cultural standards while simultaneously delivering functional, emotional, and religious values. Theoretically, the study bridges gaps between service quality models and faith-based consumer behavior, suggesting that existing frameworks such as SERVQUAL may need adaptation for culturally specific contexts. Practically, it offers actionable insights for app developers, tourism managers, and halal service providers, identifying key service attributes that can boost user satisfaction, loyalty, and trust in halal tourism. Ultimately, the study positions halal tourism apps as a unique service environment requiring tailored solutions and calls for future research to further explore how cultural and religious factors shape digital service expectations across sectors.



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