

## User Experience Through Psychological Ownership and Religious Coping: A Sentiment and Thematic Content Analysis of Smart App Update Reviews

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### Abstract

This study examines how mobile app users respond to technological changes affecting non-core religious features, focusing on the "Haqibat Al-Mu'min" application. Drawing on Religious Coping Theory and Psychological Ownership Theory, it proposes a theoretical framework explaining users' disproportionate reactions to malfunctions in devotional functions, particularly the Istikhara feature, despite continued app loyalty. Using a natural pre-post event design, the study analyzed 571 Google Play Store reviews split into two equal time periods, employing a mixed-methods approach combining sentiment analysis and thematic content analysis. Results showed no significant change in users' overall app perception after the update, yet a significant increase in mentions of the Istikhara feature, strongly linked to negative reactions underscoring the feature's importance to users. Despite rising complaints, satisfaction with the app did not decline; instead, users predominantly requested restoration of the missing feature rather than app discontinuation, a pattern consistent with psychological ownership dynamics. These findings support a hybrid explanatory model in which religious coping drives users' emotional attachment to the app, while psychological ownership sustains their loyalty despite dissatisfaction. Theoretically, the study contributes to user experience and digital religiosity research by clarifying how users respond to future revisions, offering concepts that can help developers of religious applications anticipate and manage user reactions to upcoming updates

**Keywords:** Smart religious applications, religious coping, psychological ownership, user reviews, sentiment analysis.

### 1. Introduction

Current smartphone apps are nowadays areas that impact users' social and spiritual practices in the fast-paced of digital transformation. This change is most evident in religious-ritual uses, such as reminders of prayer times, direction signs for the qibla, recitations of the Qur'ān, and interactive worship (Campbell, 2013). The existing literature suggests that smart religious applications are becoming more important to build up spiritual discipline and continue in devotional activities. But such changes bring with them issues of quality of the digital experience as well as authenticity of spiritual experiences (Bellar, 2017). In Islam, Istikhara is a kind of prayer that can be made to request

His guidance in a situation of uncertainty, like when choosing a particular course of action, such as marriage. It thus serves as God's guidance in choosing between two alternatives (Edgar & Henig, 2010). Past research has demonstrated that technical failures or cumbersome user experience often create a noticeable level of dissatisfaction among religious users, especially when these issues compromise essential devotional tasks like making the call to worship (adhan), informing the faithful of worship dates, or reciting the Qur'an (Busro & Hakim, 2025). Such a trend has also been observed in recent studies that focus on non-Islamic religious uses; a large-scale evaluation of user experiences of a spiritual application found that the experience of high frequency usage is related to a sense of improvement in spiritual well-being and one's relationship with God, but that the relationship with deeper psychological dimensions is more complex and is sensitive to the design quality of the application (Laird et al., 2024). A further study on Islamic prayer-reminder applications also concluded that the outward discipline of prayer could be significantly enhanced through the use of digital nudges, but that this did not have such a strong impact on the inner spiritual presence - a finding that highlights the need for design that better aligns with the emotional side of religious applications (Paradisa et al., 2025). Albalawi et al. (2023) noticed that previous studies on religion applications have largely concentrated on a functional description, and it is not adequately known what users actually experience when undergoing technical update.

Religious Coping Theory (Pargament, 1997) provides an explanation of how people use their religion to cope with challenges. Current Islamic application concentrates more on the functional performance rather than supporting the user's religious experience (Kabir et al., 2025). App features include adhkar (remembrance), adhan, and Istikhara which are active coping strategies for dealing with anxiety and decision making uncertainty. The studies conducted recently have shown that the Islamic applications are not only technically used but serve as media for conveying religious guidance and assisting in decision making as well as addressing spiritual needs for the user, meaning that the disruption of the core religious functions is far more influential than if religious applications were used just as technical tools (Aydar, 2009). This is corroborated by recent studies on psychological ownership in digital applications, where psychological ownership is shown to be built on two foundations: psychological ownership linked to levels of gratification and engagement provided by the application (Murugananatham & Kumar, 2025); and psychological ownership linked to the user's identity and cultural factors that influence his or her attachment to the digital service itself (Liang et al., 2024), with the former being related to levels of enjoyment and engagement the application provides, and the latter more to his or her identity and cultural factors that influence his or her attachment to the digital service itself. These disruptions in technical performance, therefore, trigger emotional distress and an extended user reaction that goes beyond the usual frustrations of using typical software (Bellar, 2021; Tsuria et al., 2021).

Although the number of users of smart religious applications in the Arab and Islamic worlds has continued to increase, developers keep on producing updates based on engineering and marketing considerations, without bothering to differentiate between religious applications and traditional,

functional software. As a result, when some changes - like the temporary removal of Istikhara feature or the redesign of the adhan interface - disrupt the function, they can lead to dissatisfaction in the user's rating platforms, as recent literature shows how application changes are noted in the tone and negative orientation of reviews in various digital settings (Munira & Manikonda, 2026; Aljedaani et al., 2026).

The central issue of this research is the lack of explanatory models that are able to take the phenomenon under consideration. On the other hand, the religious-coping literature (Pargament et al., 1998) holds a fascinating explanation for why users develop an existential attachment to devotional features which surpass their functional value because they represent perennial spiritual coping strategies which users use when making life consequential decisions. However, despite the recent research that has shown that patterns of satisfaction and dissatisfaction were quantifiably measurable in user reviews for both service and spiritual applications (Shobil & Al-Hagree, 2026; Laird et al., 2024), this literature cannot explain how this attachment translates into quantifiably measurable digital behaviors, nor why loyalty is maintained for applications when there is a lack of satisfaction.

In contrast, the psychological-ownership literature provides a clear description of the nature of reactions to violation of acquired ownership (Pierce et al., 2001; Pierce et al., 2003). It also illustrates that changes that interfere with the users' existing relationships with digital assets can elicit a reaction that is more severe than the underlying technical change - a finding supported by recent research showing that psychological ownership is associated with the extent to which users engage with and are satisfied with that digital asset, whether it relates to mere identity or to richer factors of culture and identity (Muruganantham & Kumar, 2025) that govern user attachment to the application. However, this view does not account for an increased reaction when the impacted feature is related to devotional and spiritual experiences, but not to just functional tasks (Pargament, 1997; Ano & Vasconcelles, 2005), which points to a theoretical gap between psychological ownership and religious coping. This phenomenon has not been explored in the context of psychological-ownership in the recent psychological-ownership literature which has remained limited to consumer and commercial settings (Murugananatham & Kumar, 2025; Liang et al., 2024). To summarise, the existing religious-coping literature sheds light on factors that drive reviewer dissatisfaction when the disruption occurs in the Istikhara feature but does not offer a structure that specifies how the reviewer's feelings of dissatisfaction manifest in digital reviews.

Further, it recognizes that users will require that the malfunction be corrected, but it doesn't explain why the negative reaction is stronger than typical technical malfunctions. The current study is located at this conceptual nexus to provide an integration interpretation of user reactions. Theoretically, this difference is more noticeable within the context of Islamic digital religious practices. Previous research has suggested that smart religious applications are part of Muslims' lives (Bellar, 2021); however, it also highlights the need for further research to fully understand how behaviors emerge, as recent studies have observed that some behaviors indeed have an effect in relation to the use of digital reminder and devotional applications, while other affectual dimensions such as devotion itself

have been shown to be less affected (Paradisa et al., 2025; Laird et al., 2024). This means that users can establish a special relationship with these devotional sites. This unique combination can create a rich ground for the development of an integrated framework of spiritual coping and psychological ownership.

The solution of this problem has both theoretical, methodological and practical importance. Theoretically, the study could be considered a further development of religious coping theory by placing the use of smart applications as a novel means of spiritual coping (Pargament et al., 1998) and psychological ownership theory (Pierce et al., 2003) into the field of digital religion, a space that is little explored to date, to account for user loyalty as opposed to rejection. Theoretically, the study combines the advantages of sentiment analysis and thematic content analysis, while integrating the original user-review data, which provides a scalable other way of conducting the study compared with traditional surveys. In practice, the results provide a conceptual framework for distinguishing features with flexible structural-functional attributes from features with high psychological ownership, and make them available for developers to assess the behavior of the latter before making changes or eliminating them.

Therefore, the study has four interrelated goals, which are as follows: to capture the evolution of users' attitudes before and after the disruptive technical change; to identify the themes in user responses and connect the disrupted application's specifically devotional nature to the levels of emotionally laden reviews; to determine how much psychological ownership of the application is associated with the intensification of emotionally charged responses and the avoidance of total rejection; and to develop a hybrid conceptual model that integrates religious coping theory and psychological ownership theory in the context of digital religious, aiming to provide an original contribution to the broader literature.

The following research questions are raised in the context of this central research problem of how religious coping and psychological ownership intersect in explaining user reactions in the absence of the Istikhara feature in Haqibat Al-Mu'min application:

- RQ1: Whether the sentiment of the user reviews shifted significantly after the update in February 2026 and whether this shift can be attributed to the deletion of the Istikhara feature specifically or other general features?
- RQ2: How much do post update user reviews signal psychological ownership – active negotiation to restore the feature as opposed to abandoning the platform?
- RQ3: Is the drop in user sentiment better predicted by the update as a temporal event (as a single event in time) or by the specific disruption of the Istikhara feature?

## 2. Theoretical Framework

### 2.1 Analysis of User Reviews of Smart Applications:

A lot of efforts have been made to analyze mobile-app reviews to decipher the relationship between numerical ratings and textual reviews. For example, the large-scale user-review dataset was analysed to evaluate the performance of applications by Li et al. (2017). Their research reveals that numerical ratings are not sufficient on their own to convey a complete user experience; texts can contain valuable information about the operation of the product, as well as nuances. Hu et al. (2018) also notes other inconsistencies; they find that quantitative measures do not necessarily match the functional issues users have, as they often give high ratings while simultaneously raising functional concerns.

In the development environment, Di Sorbo et al. (2016) observed that user feedback is seldom monochromatic as it can contain both positive and technical comments, and more specific suggestions for improvement. In short, the power of textual analysis becomes an essential method for the detection of exact operational fault instead of using the arbitrary numerical scores. Not only that, but Wang et al. (2021) noted that there was a divergence between technical changes and user needs, as users continued to have complaints that were never addressed even after subsequent software improvements were implemented. User evaluations are not limited to the functional aspects of the product. However, application ratings are found to be inextricably linked with emotional experiences and holistic impressions, and not just functional performance (Khalid, 2014). In line with this, Fang et al. (2023) reported instances in which the ratings were overwhelmingly positive but nonetheless included severe criticism, especially of particularly sensitive software functions.

This is especially true on value driven platforms. From a digital-religion literature, Campbell (2023) noted that users often have strong symbolic and emotional connections to religious apps. These connections can lead to lasting user satisfaction and loyalty, even when technical issues arise, encouraging them to give high ratings and ongoing assistance. This collection of writings collectively demonstrates how a connection between quantitative ratings and qualitative reviews is not always straightforward; the emotional intimacy and symbolic significance of these spaces strongly influence how these users use the digital platform and how they rate digital religious spaces.

Kabir et al. (2025) stated that Islamic applications are not just a mere technical application but for their users are also a way of supporting religious practice and maximizing motivation and spiritual experience. It was also found that users want these applications to have features that enable them to conduct rituals and fulfill their daily religious needs. The literature in recent years shows that religious applications are linked to spiritual growth and better well-being and mental-health outcomes among their users (Laird et al., 2024); that is, regular use of religious applications carries a meaning beyond the provision of digital services, and has become a part of daily religious practice.

## 2.2 Religious Coping:

The importance of religious coping as a theoretical building block in the psychology of religion is maintained. Pargament (1997) first developed it to account for people's use of their faith to cope with life stressors. In this cognitive model, religion is not simply a belief, but is an active psychological and behavioural process which is used to restructure meaning and reduce suffering. The coping pathway is split into two different pathways: positive coping (strengthening hope and existential coherence) and negative coping (representing spiritual or emotional struggle) (Pargament et al., 1998).

This mechanism has moved beyond the physical ritual and is now present in today's contexts in digital environments. These applications, which provide adhkar, adhan, and istikhara, have become an integral part of the spiritual aspect of everyday living. If these features are going wrong, it's not just a simple technical problem, it's a direct assault on the spiritual/moral makeup of the user. Therefore, emotional responses are not a result of the software bug itself, but a result of the very strong embedding of such tools in the individual's religious coping mechanism.

The literature shows that there is a correlation between the length of time spent in religious activities and an increased level of psychological dependency on religious practices, which make them important supports of emotional well-being (Ano & Vasconcelles, 2005). From the perspective of the digital, the religious coping in this situation is therefore a vital linking point, directly connecting technological encounter to the existential sense of meaning for the user. Religious awareness is one of the factors affecting loyalty behaviors towards digital applications, because it affects the adaptation of the user when the functions of the digital application are in accordance with his needs and values in religion (Hasan et al., 2024). This discovery implies that the user-apps relationship in a religious context cannot be based on technical efficiency only, but it is also influenced by religious value given to some of the applications' digital features by the user.

## 2.3 Psychological Ownership:

According to the psychological ownership theory, a state of mind in which a person feels that an object belongs to them, regardless of legal ownership (Pierce et al., 2001). This perception is realized in three major ways: to have control over the object; to have close knowledge of its functions; and to make oneself involved in the use. Combining these elements creates a strong psychological attachment between the user and the system. In digital ecosystems, apps used regularly and repeatedly become into extensions of the self, with the users of the systems systematically incorporating specific configurations and interactions into their personal routines and self-presentation in the digital world. The software is used over time to have a more personal effect and become a personal environment, according to the person's behavior and spiritual life. This feeling of ownership is strongly reinforced by the close, intimate and sacred relationship between the platform's users and the platform itself, particularly in the context of digital religious platforms.

As a result, the adoption of a new or deleted core element of a product, like the Istikhara tool, is usually not perceived as a typical technical update, but rather as a direct violation of the user's acquired sense of product psychological ownership. This theoretical perspective makes sense of the heightened reactions that people show to changes that could seem small but are actually significant. Moreover, there is evidence that such threats to ownership will reliably lead to psychological responses and protest behaviors, but not necessarily to the deletion of the app (Avey et al., 2009). Psychological ownership is therefore a significant explanatory lens for understanding user actions in digital religious infrastructure.

Previous research on religious applications suggests that the concepts of psychological ownership are also present in the users' digital environment, because the user expects the religious services he uses regularly to continue to be present in the digital space, and the continuity of these services is an integral component of the quality of religious experiences in the digital space, not an additional feature (Agung et al., 2024). Ownership feelings towards a digital element are not necessarily linked to legal ownership, but rather to continued use, control and to the digital element being merged with the identity and sense of belonging of the user. In their paper, Krauss and Wienrich (2025, p. 2) list three motives as the basis of digital psychological ownership: self-efficacy, self-identity, and belonging; and three routes to digital psychological ownership: control, accumulated knowledge, and transfer of identity to the digital object.

#### **2.4 The Relationship Between Religious Coping and Psychological Ownership:**

The nature of people's interaction with value-laden technologies provides the basis for the integration of psychological ownership, religious coping and digital religiosity. Religious coping theory, which states that religious practices and symbols are important resources which are used to process stress, decrease anxiety, and direct decision making processes. With time, these devotional practices become important coping strategies for emotional management and existential security (Pargament et al., 1998).

In the digital space, these coping mechanisms break away from the physical realm and re-appear in the context of religious-based applications that offer spiritual practice anytime, anywhere. This constant access to the internet contributes to digital religiosity – a term for spiritual routine that is actively mediated by technology (Campbell, 2013). At the same time, psychological ownership theory posits that users will experience a sense of ownership over common items in a digital setting. These perceptions are a result of a feeling of control, intimacy, and investment that develops when a behavior is repeated (Pierce et al., 2001; Pierce et al., 2003). Other research into digital religion also suggests that intensified use of religious applications can lead to their incorporation in users' lives (Díez Bosch & Micó, 2023), thus supporting the psychological-ownership interpretation which holds that the repeated use of a tool can create a sense of ownership for it and its features.

These two theoretical frameworks being combined here suggests that religious elements in an application serve a dual purpose: as an extended function which supports spiritual coping, and as

psychological ownership items. Recent literature on the convergence of digital religion and human-computer interaction is supportive of this view, suggesting that symbolism and emotion in applications have a significant impact on the acceptance, rejection, and negotiation of software update. When devotional tools play a significant role in the user's everyday life, this is particularly striking (Karahanna et al., 2015). Religious coping and psychological ownership together create a much more comprehensive perspective to understand the strength of user reactions to technical changes in religious applications and provide a unique analytical advantage.

### 3. Methodology

#### 3.1 Research Design:

The study uses natural pre-post event design for analysing Haqibat Al-Mu'min application users' reviews on Google Play Store. This approach is justified because the software update will be released on February 17, 2026, which is a natural, external event, beyond the researchers' control. Such events are classified as natural experiments by Shadish et al. (2002) and offer a unique opportunity to evaluate the situation before and after an event without the need for artificial manipulation. Thus, this documented update becomes the independent variable in a quasi-experimental interrupted time-series design. Using app-store reviews fits well with Kozinets' (2019) notion of unobtrusive naturalistic data. These kinds of data reflect real-world responses in an unscripted context and represent a form of social desirability bias that is typically found in conventional survey approaches.

The research design combines quantitative content analysis and sentiment analysis to analyze the reactions that have been observed as a result of the update. By applying this hybrid approach, the authors are directly answering Krippendorff's (2018) call for integrating the quantitative with the qualitative, thematic, approach to uncovering semantic dimensions that can be missed when relying on numerical data. In addition, Creswell and Creswell (2018) support the use of mixed-methods research designs as those designs provide a more complex understanding of complex social phenomena than single method designs. This quasi-experimental design has strong implications to understand natural user behavior, but it also has some methodological drawbacks, which will be explained in Section 3.6.

#### 3.2 Study Context:

Haqibat Al-Mu'min application is one of the most downloaded Islamic devotional apps, with over 10 million downloads from the Google Play Store and has a 4.6 ratings out of 5 rating system at the time of data collection. This context places the analysed sample of 571 reviews into the wider population of uses of the product and highlights that the localized reaction reported in this study was taking place in the environment of overall high levels of satisfaction and was not an indication of a falling or poorly rated product. The analysis is split into two symmetric three-month time periods, one prior to the update (17 November 2025 to 16 February 2026) and one post-update (17 February 2026 to 17 May 2026).

### 3.3 Population and Sampling:

The target population consisted of all the reviews of the application published on the Haqibat Al-Mu'min page on the Google Play Store from November 17th, 2025 until the day before May 17th, 2026. All samples were collected using a comprehensive-census approach, and not by probability sampling. These user reviews are examples of spontaneous behavioural data. They can provide significant explanatory power, since they record real interactions in a real digital environment, and they can avoid the self-reporting biases that are often found with the traditional survey instruments.

Google Play has an intrinsic categorization of the user feedback by device – mobile phone, tablet and desktop/Chromebook. After the initial review of these three segments, the final sample was intentionally limited to those reviews that were submitted using tablet devices. There were two main methodological considerations that lay behind this choice. The higher resolution of the tablet screen and the improved user interface make it easier to carefully consider the review and develop it textually, which is a stark contrast to the often wildly inconsistent, and even contradictory, writing of reviews submitted through the mobile phones. Second, the absolute number of desktop and Chromebook reviews was not large enough to allow for a detailed study of them.

### 3.4 Data Collection Procedure:

Data were extracted using the Chrome browser extension Instant Data Scraper (version 1.6.0; Flavir Technology, LP, 2025), which is used to extract data straight from web interfaces. The data gathered consisted of the complete review text, precise publication date, and device type on which the application was installed, such as tablets, instead of cell phones. After extraction, the raw data were closely examined and a detailed cleaning process was carried out. In this process, the data was cleaned by eliminating duplicate entries, incomprehensible entries, and empty entries, as well as any text that was not relevant for the semantic analysis.

The study's time pivot point was the core update of the application on 17th February 2026. The final analytical sample consisted of 571 'cleaned' and 'filtered' device-only tablet reviews. The number of these reviews were evenly split between the two comparison periods: 281 pre-update reviews and 290 post-update reviews. All the data was de-identified, open-sourced, and left by users through a public interface of a digital store. There was no personally identifying information or private data gathered in the process of data-scraping and no direct interaction or communication with the users was required in the design of the research.

### 3.5 Measures and Coding Procedure:

The study's basic constructs were operationally defined and the coded review was conducted based on these definitions in order to gain conceptual precision. Religious applications were operationally defined as smart mobile software (Haqibat Al-Mu'min application through tablet devices) that offered users interactive digital devotional tools (including adhan, adhkar, and Istikhara), viewed not as a tool, but as a digital environment to be integrated into the daily spiritual practice. Religious coping

was defined as the behavioral and psychological use made by users of the particular devotional features within the digital devotional to inform their decisions throughout the day and to ease any psychological stress they felt brought on by these features; disruption of religious coping was measured by the frequency and intensity of negative sentiments users expressed in their user review for the devotional following the update.

Psychological ownership was conceptualized as the extent to which users feel the app and its particular features are their possession, measured psychometrically by how often they resort to active negotiation and how often they make demands on the developers to return the features they have lost. The disruption caused by the update was operationally defined as Istikhara being a highly sensitive part of the adaptive software, for which users are dependent and relied on for spiritual decision making, with the disruption or removal of Istikhara being explicitly mentioned in their reviews, measured in terms of a statistically significant increase in user reviews.

Both aspects of classification, i.e., sentiment class (positive, negative, neutral, mixed), and thematic class (Istikhara, adhan/notifications, suggestions about content), were done manually without applying automated sentiment-analysis tools to avoid losing the context and dialectal nuances of the expressions of religious sentiment in the Iraqi/Arabic colloquial. All coding was double coded by two coders independently, using the same coding protocol to ensure coding reliability. The reliability of the sentiment and thematic classification reported in Section 4 were evaluated using Cohen's Kappa which yielded a  $\kappa$  value of .71, suggesting that there is substantial agreement between coders (Landis & Koch, 1977). Differences amongst coders were settled by discussion and consensus before finalizing the data set.

### 3.6 Limitations:

The researchers make a critical analysis of the results of this study based on the specific methodological limitations. The first is that the same reviewers do not participate in both the pre- and post-updated groups. This is a fundamental threat when comparing natural events in samples, as Shadish et al. (2002) point out, therefore any differences in reviewers' responses should be viewed with care, rather than as evidence of individual-level behavioral shifts over time.

Second, the quasi-experimental study design is without a control group. This restriction makes it difficult to determine if the changes in user behavior were the sole result of the update, or if the changes were caused by other factors that may have been happening concurrently to the users (Shadish et al., 2002).

Third, data was limited to tablet device users of the application. This is over the more numerically dominant base of smartphone users, arguably the major audience segment for a daily use religious app. The characteristics of tablet users are likely to vary from those of the mobile-phone user and their intensity of engagement as well as their context of use. Thus, the results from the study do not necessarily apply to all readers of a tablet device, but rather to the tablet-based reviewers tested.

## 4. Results

### 4.1 Descriptive Analysis of the Study Population:

The total number of user reviews was almost unchanged in the pre- and post-update periods, with a slight increase of 3.2% after the update. The way in which people engage with it indicates that the changes to the structure didn't push them to delete the app, but they very much used the comment section to share their reaction. This continuous cycle is a reflection of the psychological ownership aspect that users feel not only as a useful application, but as a right that belongs to them. Users were reacting to the technical disruption not by giving up on the application, but instead by a reaction to a re-appropriation of the disrupted features-these digital products were a part of their daily spiritual coping, which led to a reaction of reclaiming the disrupted features.

Table 1. Review Volume Before and After the Update

| Indicator     | Before Update | After Update | Total | % Change |
|---------------|---------------|--------------|-------|----------|
| Total Reviews | 281           | 290          | 571   | +3.2%    |

Note. The sentiment shifts presented in Table 2 are not confounded by user attrition because there was little difference in the volume of reviews across periods (+3.2%). The high similarity of reviews across periods is not indicative of application abandonment or review-bombing, but instead suggests that the review process remained stable.

### 4.2 Sentiment Analysis:

The majority of evaluations were positive in both periods, although there was a significant decrease in positive reviews in the post-update period. Both mixed and negative reviews were distributed in this decrease. This change is not merely a sign of discontent, it is a sign of engagement in users' religious coping mechanisms, as a result of the disruption of high sensitivity features, in this case Istikhara, which is a sign of great psychological ownership. Users did not simply give negative ratings or delete the application, but rather demonstrated a highly specific form of protective attachment, forgoing the purely negative rating, but instead, they actively negotiated the malfunction by combining their general appreciation of the application with a specific, targeted grievance, thus maintaining their loyalty to the application while attempting to re-establish their spiritual routine.

Table 2. Sentiment Category Distribution by Period

| Sentiment Category | N (Before) | % (Before) | N (After) | % (After) | Total | Trend |
|--------------------|------------|------------|-----------|-----------|-------|-------|
| Positive           | 223        | 79.4%      | 208       | 71.7%     | 431   | ↓     |
| Mixed              | 24         | 8.5%       | 40        | 13.8%     | 64    | ↑     |
| Neutral            | 8          | 2.8%       | 8         | 2.8%      | 16    | =     |
| Negative           | 26         | 9.3%       | 34        | 11.7%     | 60    | ↑     |
| Total              | 281        | 100%       | 290       | 100%      | 571   |       |

Note. Overall positive sentiment remained the modal category for both periods, in spite of a drop of 7.7 percentage points from 79.4% to 71.7%, as the pattern of positive sentiment continued despite the drop in positive reviews.

#### 4.3 Thematic Analysis:

The thematic analysis involved coding three main axes: the Istikhara feature, adhan and notification problems, and suggestions for new content. There are more reviews referring to the Istikhara feature after the update, with the rate of occurrence jumping from 6.1% to 13.1% (+7 points, about x115%). On the contrary, there was no significant difference in the adhan/notifications and content suggestions between the two time periods. Here are some users' old and new reviews about update. Table. 3.

Table 3. Illustrative User Review Excerpts

| Period        | Theme                                 | Illustrative Excerpt in English                                                               | Illustrative Excerpt in its original language                              |
|---------------|---------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Before Update | Satisfaction with the app             | "One of the best good apps - well done, may God bless your efforts, best wishes God willing." | من أفضل البرامج الجيدة، أحسنتم وبارك الله بجهودكم، موفقين بإذن الله تعالى  |
|               | Feature request (Istikhara)           | "Very nice, but why isn't there an Istikhara feature?"                                        | "حلو جدا، بس ليش ما أكو بيه استخارة؟"                                      |
|               | Constructive feedback about the app   | "A truly excellent app, but regarding the Holy Qur'an I hope you resolve these two issues..." | تطبيق جدا رائع، لكن فيما يتعلق بالقرآن الكريم "...أرجو حل هاتين المشكلتين" |
| After Update  | Appreciation of the Istikhara feature | "The Istikhara feature is excellent, may God reward you."                                     | "ميزة الاستخارة ممتازة، جزاكم الله خيرا"                                   |
|               | Complaint about feature removal       | "Can I know why you removed the Istikhara feature?"                                           | "مممكن أعرف ليش شلتوا خاصية الاستخارة؟"                                    |
|               | Demand for restoration                | "There's no Istikhara, I need it."                                                            | "ماكو استخارة، أنا أحتاجها"                                                |

Note. that the excerpts were independently coded by two raters ( $\kappa = .71$ ) and that they are illustrative of the themes quantified in Table 4, but not exhaustive.

The dynamic can be further understood from the qualitative excerpts from user reviews Table 3. The comments made by users like "why did you remove the Istikhara feature?" and "I need it" seem to go above and beyond the standard user review. Looking at psychological ownership, these reviews indicate that users might not see Istikhara as just another software function but rather acquire one that is embedded in their religious regimen. These reviews can therefore be taken as a call to restore a broken feature, which implies emotional or symbolic importance of a feature that doesn't necessarily show up on Google Play ratings.

Table 4. Thematic Frequency by Period

| Theme                       | N (Before) | % (Before) | N (After) | % (After) | Trend  |
|-----------------------------|------------|------------|-----------|-----------|--------|
| Istikhara (missing feature) | 17         | 6.1%       | 38        | 13.1%     | +115%  |
| Adhan and notifications     | 12         | 4.3%       | 13        | 4.5%      | Stable |
| Content addition requests   | 14         | 5.0%       | 15        | 5.2%      | Stable |

Note. The thematic frequencies of the Istikhara theme (+115%) are clearly distinct from the adhan/notification and content-request themes, which are relatively stable, and which stand out as the main reaction points of users to the update.

The thematic analysis indicates a certain area of the users participation (Istikhara feature). The technical problems mentioned in the notification and normal suggestions for content did not change significantly from one period to the other, but the number of comments specifically about the available tool (Istikhara) increased significantly in proportion. This localized change indicates that the individual's response might be to a disruption of a familiar religious coping mechanism, rather than to a general reaction to the software change.

#### 4.4 Inferential Analysis:

After the descriptive and thematic analyses, a series of inferential statistical tests were undertaken to check the significance of the differences and relationships between the two periods of updates, and to see if the patterns identified in the descriptive and thematic analyses were statistically significant or if they were due to random variation of the data.

The findings of the chi-square tests were combined in one analytical table to present a coherent statistical result that can answer the first and second research questions for the study. This is because of the organic connection between digital behaviors: the analysis of sentiment patterns (Q1) cannot be done without analysis of the stability of general satisfaction (Q2), and the direction of issues to a particular tool without users leaving the site (Q3). This summary table presents a representation of the magnitude of localized disruption (specific to Istikhara) and the structural stability of overall satisfaction, giving a holistic quantitative picture of user reactions.

##### 4.4.1 Sentiment Variance and Feature-Level Associations: Addressing RQ1 and RQ2:

The results of the consolidated chi-square analysis for Research Question 1 and 2 (overall sentiment stability and localized association with the Istikhara disruption) are presented in Table 5.

Table 5. Chi-Square Analysis of Sentiment Variance and Feature Associations

| Statistical Test Focus                                                        | Test Value ( $\chi^2$ ) | Significance (p) | Effect Size |
|-------------------------------------------------------------------------------|-------------------------|------------------|-------------|
| Overall sentiment variance (4 categories: positive, negative, neutral, mixed) | 5.448                   | .142             | .098 (V)    |
| Binary sentiment variance (positive vs. non-positive)                         | 4.093                   | .043 (*)         | -           |
| Association with Istikhara disruption                                         | 7.367                   | .007 (*)         | .114 (V)    |
| Association with "Adhan and Notifications"                                    | 0.000                   | 1.000 (ns)       | -           |
| Association with "Content Requests"                                           | 0.000                   | 1.000 (ns)       | -           |

Note. The effect size (Cramér's V) for the overall sentiment test and the binary sentiment test are both below the usual thresholds for even a small effect (Cohen, 2013) while the Istikhara-specific association is just shy of a small-to-moderate effect, suggesting that the impact of the update was focused rather than pervasive.

**4.4.2 Predictors of Sentiment Decline: Addressing RQ3:**

Table 6 shows the binary logistic regression model for Research Question 3-what do the updates have to offer independently that is predictive of sentiment decline

Table . Binary Logistic Regression Model Predicting Non-Positive Sentiment

| Independent Variable (Predictor)                | Wald $\chi^2$ | Significance (p) | B / OR                  | Model Fit                           |
|-------------------------------------------------|---------------|------------------|-------------------------|-------------------------------------|
| Software update (as an isolated temporal event) | 4.467         | .043 (*)         | B = -0.416 / OR = 0.660 | Nagelkerke<br>R <sup>2</sup> = .007 |

Note. Overall, however, the negligible Nagelkerke R<sup>2</sup> for the update (.007) suggests that, outside of feature-specific disruption, the change's proximity to the sentiment drop explains less than 1% of the variance and is a significantly weaker predictor than feature-specific disruption (cf. Table 5).

The nonparametric assessment (using the Mann-Whitney U test for ordinal sentiment scores -U = 37,778, p = .046, effect size r = .073) also shows that there is a statistically significant shift in user satisfaction after the update, although the median of the scores is still on the positive side in both periods.

To be able to complete the analysis and answer the third research question on the strongest predictor of the sentiment decline, a binary logistic regression model is presented below. The reason this table was specifically created was to isolate the effect of the “software update” - treated as a mere isolated temporal marker on calendar time - and to test its own explanatory power in predicting the decrease in sentiment, before comparing this power with statistically generated results from the disruption of the devotional features themselves.

**4.5 Interpret Results in the Context of the Research Questions:**

Based on the statistical evidence presented above, the following interpretation of the results of the study may be given to address the research questions:

Result of the chi-square analysis for Research Question 1: sentiment change and Istikhara: There was no structural change in the general sentiment of the users after the update (p = .142) (Table 5). The binary and ordinal evaluations showed a slight drop in absolute positivity (p = .043, respectively). This emotional change is identified after isolating the variables, and is limited to the Istikhara feature (p = .007), but not the other operational features (such as adhan). This difference can be explained by the religious-coping model, in which Istikhara is seen as a psychological coping strategy for dealing with anxiety and decisions, rather than merely a software component this accounts for the fact that negative affect was directed specifically towards Istikhara when it was missing.

The data supports the answer to Research Question 2 (the manifestation of digital psychological ownership): As you can see, there were no signs of platform abandonment due to technical dissatisfaction at all. The general stability of the median rating within the positive range, with a 115% increase in reviews that called for the restoration of the lost digital space, shows that users used the review space to engage in active negotiation to regain their lost digital space. This behaviour pattern,

where a user's psychological ownership is acquired over the application and preference for negotiation/demand over departure/abandonment, is an empirical and objective observation of a pattern.

The logistic regression model (Table 6) gives an unequivocal answer to Research Question 3, the strongest predictor of the decrease in sentiment. The update (as a one-off temporal event) showed a statistically significant effect but its predictive power for sentiment was almost negligible (Nagelkerke  $R^2 = .007$ ). In contrast, results from the association analysis (Table 5) indicated that the disruption of the specific devotional feature (Istikhara) had a significantly higher V value of .114. This difference shows that it is not the actual software update itself that is causing dissatisfaction, but the nature of the feature included in the software update - further confirming the strength of the hybrid explanatory model (religious coping and psychological ownership) in predicting the dynamics of users' digital behavior.

## 5. Discussion

The results suggest that the impact of the update on overall sentiment was only just about minimal despite the fact that a few tests revealed statistically significant differences, with all effect sizes staying within a moderate range. In contrast, the Istikhara feature had the highest rate of user engagement after the update, and complaints associated with the feature almost doubled. There was no indication that this was a concern in the adhan notifications and content suggestions, which are internal comparison themes in the thematic analysis. The distinction that is most prominent in the data, however, is the distinction between the effect of the update in this religious theme as compared to the other themes.

The other interpretation is with the framework of religious coping theory where aspects of religion become a component of the user's spiritual experience thus when the process of disruption or removal of such aspects affect the usage experience despite the fact that the application performs well without that disruption (Kabir et al., 2025). The Istikhara function might have some significance to those who are in situations of uncertainty with issues that have a direct impact on their lives – like marriage and career choice – etc. It was not expected to be captured as a normal bug report about any of the Haqibat Al-Mu'min application because the Istikhara was not used by the users in the same way as other technical issues.

Another theoretical aspect to ponder is user frustration. If the impact of Istikhara on the evaluation of the application was to cause the ratings to plummet or users to leave the application then rates are bound to drop. Neither was observed. The overall positive reviews were pretty much in tact and the substantive complaints that surfaced, for the most part, were calls for the feature to be restored and not an intention to uninstall the application. The pattern is indicative of how application ratings are connected to emotional experiences and overall impressions as opposed to strictly functional performance, as found by Fang et al. (2023), who reported comparable situations where negative ratings included criticism of the applications, specifically regarding features deemed sensitive to the

user. This makes sense in light of Pierce et al. (2001, 2003) work on psychological ownership: features that users interact with regularly, and to which they feel they have a personal relationship, will call for restoration as opposed to removal when disrupted. This is reflected in the pattern seen in this study, where users were more inclined to want to restore the feature than throw away the app. Given this context, users' sensitivity to the disruption of the Istikhara feature can be interpreted as a response to a change in the digital religious practice they have been used to, and not just a reaction to a technical error (Díez Bosch & Micó, 2023).

Lastly, this researcher discovers that in this research these two ways coping and ownership work complementary. Coping theory offers an explanation for why the disruption of Istikhara in particular drew the users' attention, and why this attention then led to demands and not to departures, as ownership theory does. In spite of this, the effect sizes are not substantial enough across the entire span, and this integration should therefore be considered as a working hypothesis. Both variables accounts for only a significant amount of the variance in user sentiment, and this twoway theoretical framework could be considered a preliminary one that needs further testing in future studies involving other variables and research designs, especially given the increased incorporation of artificial-intelligence technologies into devotional applications (Alkhouri, 2024).

## 6. Conclusions and Recommendations

### 6.1 Conclusions:

When seen together the study's outputs reveal a limited practical effect since the users of this application use some features as a digital function that has religious and personal significance more than its basic technical usage in the Haqibat Al-Mu'min application. The disproportionate complaints after the update also dovetail with the idea that some aspects of the application are more closely associated with the users' everyday lives, which is consistent with Campbell's (2013) larger claim that digital spaces can be extensions of religious practice.

The differences in features is the most striking result. The reaction to the Istikhara feature was very evident, whereas there was no significant change in its response for adhan and content-suggestion. This implies that features are not equally important to the user, even if they are grouped together in the same application, which is not necessarily reflected by performance. Concurrently, a surprising degree of overall positive sentiment persisted despite an increase in complaints about Istikhara, suggesting a type of 'loyalty' that resembles that found in the psychological-ownership literature; while the feature was present, users seem to be negotiating for its return, instead of leaving when it was removed (Fang et al., 2023; Hu et al., 2018).

From the methodological point of view, reviews in the app store emerged as an appropriate and alternative option to the surveys commonly used (Khalid, 2014; Wang et al., 2021). Thinking about the reasons for users reacting to feature disruptions as they do, religious coping theory explains the magnitude of the reaction and ownership theory explains why users do not simply abandon the

application when the feature is taken away, but instead are demanding its return (Krauss & Wienrich, 2025). This mix of features and platforms presents a general pattern of digital religious platforms, or is peculiar to this specific application of the technology? (Li et al., 2017)

## 6.2 Recommendations:

To sum up: The researcher suggests the following strategic and developmental recommendations:

1. The need for feature stratification in the application: the developers need to systematically differentiate between flexible structural-functional features and features high in psychological ownership. The latter have deep psychological ownership that needs to be assessed before modification or discontinuation, and are not addressed in this document.
2. Expectation Management for Developers: If there are features that are very sensitive, updates should be pre-tested and communicated to the user proactively. Updates that don't comply with this condition can lead to negative emotional reactions that are greater than the technical change.
3. Developers, even though there is regular behavioral monitoring of reviews, it is necessary to use periodic sentiment analysis of reviews as an early-warning system. This way, you get to see spiritual and emotional changes earlier than they become widespread distrust or poor ratings of your product.
4. Reframing user reactions: since the reaction of the user to a removal of a feature is generally from the perspective of psychological ownership, the developer should think of such a protest as constructive interaction with the user. Improving communication channels can turn this feedback into opportunities for participative application development.
5. Directing future research pathways: future research should continue to build on this hybrid theoretical approach by applying it to other cultural and religious settings, in order to determine its generalizability. From the methodological point of view, future studies should extend the representation of mobile-submitted reviews, and most importantly, measures specific to psychological ownership in the context of digital religious applications should be created as psychological ownership scales have been created mainly in organizational settings.

## Ethics Statement

The study was conducted only with user reviews that were openly available and anonymized in the public digital platform of Google Play Store. No personally identifying data (such as usernames, account information, or contact details) were gathered, stored or used in the analysis of the research. There was no direct contact, recruitment, or communication with application users, nor was any experimental manipulation given to any person in the data collection procedure. The data used in this study was anonymized and publicly available, and therefore was not subject to formal Institutional Review Board (IRB) approval as is required under standard guidelines for the use of publicly available digital trace data that does not identify any individuals or groups. Despite this, the researchers state adherence to them in all stages of data collection, cleaning and analysis, and declare that no efforts

were made to re-identify individual reviewers or to connect the reviews to other personal data sources outside the review process.

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