ITDMA3-B22

Research Project
Proposal Presentation

23 June 2025

Prototyping a mobile engagement app: Evaluating push notification strategies for improved customer engagement

Benjamin Dahn, Kieran Horsford,
Nicolaas Huisman, Luca Karsten,
Hayden Muller, Durotimi Samuel
Supervisor – Ntombesisa Mateyisi

Background

- In today's competitive retail environment, mobile applications are crucial tools for businesses to engage with customers quickly and in more personalized ways. Push notifications, especially when well-timed, can significantly increase user activity, satisfaction, and sales.
- While larger retailers have embraced this, smaller businesses often lack the tools or insights to do the same. Studies show that excessive notifications can harm user experience, but when used correctly, they increase loyalty and time spent in the app.
- Research is still limited when it comes to how push notifications affect real retail outcomes like customer retention and purchase behavior, especially for small local stores.
- Our study aims to fill this gap using a purpose-built prototype app, and compare it to traditional methods like email marketing to help small businesses better connect with their customers and drive both online and in-store engagement

Problem statement

- Subscription-based businesses often struggle to engage customers through traditional communication methods like email.
- As a result, they face declining customer engagement, weak promotion response, and poor retention.
- This affects business revenue, customer loyalty, and sustainability.
- Mobile push notifications can significantly improve engagement, but many businesses don’t know how to effectively use push notification strategies.
- Due to limited research on how different push notification strategies influence user behaviour, this project will develop an app to test customizable notification strategies.

Research questions

1. How do push notifications compare to email communication in terms of customers’ cognitive load and informational needs?
2. How do digital engagement touchpoints, such as push notifications, affect customer loyalty and satisfaction?
3. What is the effect of push notification frequency on customer engagement and app usage?
4. How does push notification timing affect customer engagement?
5. How can a mobile app be developed to support customizable push notification strategies?
6. How can customer preferences for different types of push notifications be integrated into a customizable notification system?

Research objectives

1. Compare the effectiveness of push notifications and email communication in terms of cognitive load and meeting customers' informational needs.
2. Investigate how digital engagement touchpoints, such as push notifications, affect customer loyalty and satisfaction.
3. Assess the impact of push notification frequency on customer engagement and app usage.
4. Examine how the timing of push notifications affects customer engagement.
5. Identify potential drawbacks of push notifications, such as customer annoyance or increased app uninstall rates.
6. Develop a mobile app prototype that allows for customizable push notification strategies.
7. Integrate customer preferences for different notification types, such as promotional and reminder-based, into the app's notification system.
8. Evaluate the effectiveness of these implemented push notification strategies using metrics, such as click-through rates and customer feedback.
9. Provide recommendations for effective mobile app push notification strategies that can increase customer engagement, app retention and improve customer experience.

Justification for the study

- As retail becomes more digitized, large businesses are successfully using mobile apps to connect with their customers. But small businesses often lack the resources or tools to keep up, creating a divide.
- This study addresses that gap by exploring how mobile apps with push notifications can help smaller retailers engage their customers more effectively.
- While prior research has explored general notification behavior, there's very limited work focused specifically on small retail stores – especially using purpose-built prototype apps.
- There's also a gap in comparing mobile notifications to traditional communication methods like email. With consumer attention becoming harder to capture, it's crucial to understand how to engage customers without overwhelming them.
- Ultimately, this study aims to offer small businesses actionable insights and practical tools to improve customer communication, satisfaction, and sales.

Research project timeline

Phase	Month					
	June	July	August	September	October	November
Research planning and approval						
Literature review and strategy research						
Data collection and analysis						
Requirements gathering and system design						
App development						
Testing and refinement						
App evaluation						
Final conclusion and reporting						
Submission and presentaion						

Literature Review

- Push notifications are a daily occurrence with modern technology. Push notifications increase user engagement; however, the notifications can be intrusive, unwelcome and annoying if received too frequently.
- Well designed elements of push notification, e.g., title, can positively affect how users interact with the notification and thus the app itself.
- Sensor- and context-based timing and different user-driven notification reception modes that configure the system allow users to receive notifications from the app on the user's terms.
- Indirect app opens from notifications are not affected by the frequency of push notifications, however, uninstall rates do increase with the frequency of notifications. Meaning users respond negatively to frequent, ill-timed push notifications.
- Any form of digital touchpoint usage positively affects user engagement and satisfaction, which provides insight into positive ways to increase user engagement.
- This study uses a pragmatist framework; thus, the research can focus on the practical results and real-world application to determine whether the findings of this research are a solution to reduced customer engagement on mobile apps.
- There is a gap in the research for this topic, and it may prove difficult to find credible research papers on this research topic. This research will lead to the development of a mobile application that would pose as a plausible solution to problems discussed in this research.
- The mobile application will be developed on Flutter as it provides strong UI customisation, rapid development cycles and the most effective performances overall. A cross-framework platform would be most beneficial to this research due to time constraints and ability to reuse code across both Android and iOS.
- Ultimately, this research will investigate the effects of mobile app push notifications on customer engagement and what designs and methods can be used to make the notifications more effective.

Research Paradigm

The Pragmatism paradigm is used as it focuses on practical outcomes and real-world applications of the research to observe effective solutions to the problems presented.

Pragmatism is fitting paradigm for approaching and solving practical problems.

Aligns with the research:

- Creating a prototype mobile app to test different notifications strategies.
- Tracking of user engagement and interaction with the mobile application prototype and push notifications.
- Assessing which strategies are most effective based on engagement from users.

Researchers can use both quantitative and qualitative methods and can draw conclusions from information based on data received from tracking user engagement and user feedback to ensure accurate research findings.

Research Method – Pragmatic Design

Approach:

- Combines quantitative and qualitative methods
- Focuses on real-world problem solving
- Adapts tools based on each research question

Key Research Questions:

- Impact of push notifications vs emails on cognitive load & info needs
- Effect of notification frequency & timing on user engagement
- Influence of digital experiences on customer loyalty & satisfaction

Why Pragmatism?

- Flexible, practical, and outcome-driven
- Suited to studying user behaviour in digital environments

Limitations:

- Risk of bias in interpreting qualitative data
- Time and resource intensive

Data Collection

Online Surveys

- Online surveys will be randomly disturbed to individuals, subscribers of the current email system and users of the application.
- Closed-ended questions get more measurable and comparable answers regarding user experience with the mobile application.
- Open-ended questions more insight into user personal experience and preferences regarding push notifications.
- Surveys gather standardized feedback from a large group of users, this improves the understanding of the most effective push notification strategy.

Tracking User Engagement With Push Notifications

The application will anonymously track users interaction with the application and push notifications.

- If a user has opened the app by clicking on a notification.
- How long after a notification was sent will the user open the application.
- The frequency of interaction with the application.
- The amount of time users spent on the application.

Comparison of effectiveness of different push notification strategies.

Combining collected data from tracking and survey results will allow for better optimisation of push notification strategies.

Avoiding Biases and Ensuring Reliability

Sampling Bias

- A variety of different users will be surveyed from different demographics and age groups, as well as randomly selected users to ensure a variety of different users.

Consistent Surveys

- Surveys will have the same questions and will be hosted on the same platform and it will be clear to avoid confusion and ensure that the received data is reliable.

Piloting Tools

- An initial pilot test can be done on a smaller scale to ensure clarity of the questions and the data collected is not bias. Any issues or confusion regarding the surveys will be improved once the full-scale project is launched.

Privacy and Anonymity

- All data gathered from surveys will be collected anonymously and the tracking of user's interaction with the application and notifications will also be done anonymously.

Reliability

- The collection of tracking data will be done autonomously and will be consistently active to capture all user interactions with the application.

Data Analysis Techniques

Joint Displays

- Visually combine qualitative & quantitative data
- Compare session durations, click-through rates, and user feedback
- Helps identify patterns or contradictions

Categorization

- Organize open-ended responses into common themes
- Helps identify trends and prepare for transformation

Data Transformation

- Convert qualitative feedback into numerical data
- Enables easier comparison and statistical analysis

Limitations:

- Joint displays can be complex with large data sets
- Categorisation involves subjective judgement
- Data transformation may oversimplify and lose context

Handling Incomplete or Inconsistent Data

- Survey will have mandatory fields that need to be filled out to be submitted.
- Input validation to ensure that the entered data is in the correct format preventing invalid inputs.
- The survey results will be checked for duplicate entries, can be merged or one removed.
- Outliers in the dataset that will then be flagged for review to ensure consistent data.
- Uncompleted data sets or invalid data will be flagged for reviewed and removed if data is deemed to not be useful.
- All data sets from surveys will be stored and will be able to be reviewed to ensure correct data and complete data is saved.

Ethical Consideration

Confidentiality

- Participants data will be made anonymous and stored on a password protected Excel spreadsheet on Eduvos' server that will only be accessible to members of the research team. A separate code-key file will be used to protect participants identities.

Voluntary Participation

- All participants will join willingly and may withdraw from the research study at any time. On withdrawal any collected data will be deleted upon request.

Informed Consent

- Participants will receive a full explanation of the research study and will have to sign a consent form ensuring that the participants understand and agree.

Participant Well-Being

- The mobile application will include an option for participants to opt-out of notifications to minimize potential discomfort during testing.

Data Integrity

- Data will be collected and analysed using consistent and unbiased methods. All data collected whether positive or negative will be reported transparently.

Ongoing Oversight

- Regular review and feedback from the research team’s supervisor will ensure ethical compliance and research integrity throughout the research study.

ITDMA3-B22

Research Project
Proposal Presentation

23 June 2025

Prototyping a mobile engagement app: Evaluating push notification strategies for improved customer engagement

Benjamin Dahn, Kieran Horsford,
Nicolaas Huisman, Luca Karsten,
Hayden Muller, Durotimi Samuel
Supervisor – Ntombesisa Mateyisi