## 1. Objective

The goal of this project is to implement a "Delete Message" feature in WhatsApp that allows users to delete messages they have sent, either for themselves or for all participants in a conversation. This feature is intended to enhance user control over their conversations and improve the overall user experience.

## 2. Background and Context

As messaging becomes more ubiquitous, users are increasingly looking for ways to manage and control their digital communications. Currently, WhatsApp users can delete messages from their own view, but there is no way to retract messages once they've been sent to other users. This feature has been requested by users and is essential to maintaining WhatsApp's competitive edge in the messaging app market.

## 3. Scope

### 3.1 In-Scope

- **Single Message Deletion:** Users can delete a message for themselves or for all participants in a conversation.
- **Multi-Message Deletion:** Users can select multiple messages and delete them in a single action.
- **Time-Limited Deletion:** Users can only delete a message for all participants within a specified time window (e.g., 2 hours after sending).
- **Notification of Deletion:** When a message is deleted for all participants, a placeholder message (e.g., "This message was deleted") will be displayed in place of the original message.
- **Platform Support:** The feature will be available on iOS, Android, and Web versions of WhatsApp.
- **Encryption and Security:** Deleted messages should be permanently removed from the device and server, respecting end-to-end encryption.

### 3.2 Out-of-Scope

- **Message Recall:** The ability to retrieve and restore deleted messages will not be part of this feature.
- **Unsend Notifications:** Users will not receive notifications if a message they received has been deleted by the sender.

## 4. User Stories

1. **As a user,** I want to delete a message I've sent for everyone within a chat, so that it's removed from all participants' devices.

2. **As a user,** I want to delete a message from my chat history, so that it's no longer visible to me.
3. **As a user,** I want to know that I have a limited time to delete a message for everyone, so that I can act quickly if necessary.
4. **As a user,** I want to see an indication that a message has been deleted, so that I understand that content was removed.

## 5. Functional Requirements

1. **Message Selection**:
    - Users can select one or more messages to delete.
    - Long-press on a message to select it; additional messages can be selected by tapping on them.
2. **Delete Options**:
    - Upon selecting a message, users are presented with options to "Delete for Me" or "Delete for Everyone."
    - "Delete for Everyone" will only be available within the defined time window.
3. **Placeholder Message**:
    - A placeholder ("This message was deleted") replaces the deleted message in all participants' chat histories.
4. **Time Window**:
    - The time window for deleting a message for everyone is 2 hours from the time the message is sent.
    - After 2 hours, the "Delete for Everyone" option is disabled, and only "Delete for Me" is available.
5. **Notifications**:
    - No notification is sent when a message is deleted for everyone.
    - The placeholder message is visible to all participants in the chat.
6. **Security**:
    - Deleted messages are purged from the server after deletion.
    - The feature must comply with WhatsApp's end-to-end encryption standards.

## 6. Non-Functional Requirements

1. **Performance**:
    - The deletion process must be instantaneous, with no noticeable delay for the user.
    - The app must handle the deletion process smoothly, even in group chats with a large number of participants.
2. **Reliability**:
    - The feature must work consistently across all supported platforms (iOS, Android, Web).
    - The deletion must be irreversible, ensuring that the deleted messages cannot be recovered.

3. **Usability**:
    - The interface must be intuitive, ensuring users can easily find and use the deletion options.
    - Provide clear feedback when a message is successfully deleted.

## 7. Assumptions

- Users have updated their app to the latest version to access this feature.
- Participants in a conversation must all be online for "Delete for Everyone" to be successful.

## 8. Dependencies

- **Backend Support**: Requires updates to the message handling service on the server to support deletion.
- **UI/UX Design**: Collaboration with the design team to create intuitive delete options and placeholder messages.
- **Compliance**: Legal review to ensure the feature complies with data privacy regulations.

## 9. Risks

- **Data Privacy Concerns**: Users may have concerns about whether deleted messages are truly removed from all devices and servers.
- **Edge Cases**: Handling scenarios where users are offline or have outdated versions of the app.

## 11. Open Questions

- Should the time window for deleting messages be configurable by the user or remain fixed?
- How will the feature behave in the event of network interruptions during the deletion process?

**Project Name:** Adding Two-Factor Authentication (2FA) Using Google Authenticator
**Document Status:** In Progress

**Target Release Date:** End of Q3 2018

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## 1. Introduction

The purpose of this document is to outline the requirements for adding Two-Factor Authentication (2FA) to our platform using Google Authenticator. This feature aims to enhance account security by providing an additional layer of authentication for users accessing their accounts through our mobile, web, and desktop portals.

## 2. Goals and Objectives

- **Enhance Security:** Provide clients and users the option to add an additional layer of security when accessing their accounts.
- **Ensure Integrity:** Maintain the integrity of the client-server connection when users utilize Google Authenticator for authentication.
- **User Experience:** Implement 2FA enablement with a seamless and user-friendly interface consistent with our product standards.
- **Communication:** Develop a marketing campaign to inform customers about the new 2FA feature.
- **Recovery Path:** Offer a clear recovery process for users who lose access to their authentication device.

## 3. Background and Context

Two-Factor Authentication has become a standard security measure across major technology platforms. As our company often handles highly sensitive documents and information, it is imperative to offer this additional security layer to our customers who request it. Additionally, for user onboarding and high-risk transactions, we should consider making 2FA a mandatory part of the process due to the higher probability of fraud in these areas.

Google Authenticator provides a time-based one-time password (TOTP) that changes every 30 seconds, requiring users to have access to their device for authentication in addition to their username and password.

## 4. Scope

### 4.1 In-Scope

- Implementation of 2FA using Google Authenticator across mobile, web, and desktop platforms.
- Development of user interfaces for enabling and managing 2FA within user accounts.
- Integration with existing authentication systems to support 2FA during login.
- Creation of a recovery mechanism for users who lose access to their authentication device.
- Development of marketing materials and campaigns to promote the new feature.

#### 4.2 Out-of-Scope

- Support for alternative 2FA methods (e.g., SMS, email-based codes).
- Overhauling the entire authentication system beyond integrating 2FA.
- Changes to user onboarding processes unrelated to 2FA implementation.

## 5. User Types

- **All Registered Users:** The option to enable 2FA will be available to all users with an account, without distinction between different user types or roles.

## 6. Assumptions

- Users will access 2FA features through mobile apps, web browsers, and desktop applications.
- Users do not need a Google account to use Google Authenticator.
- All devices with Google Authenticator installed will use Network Time Protocol (NTP) for clock synchronization.
- Users have access to devices compatible with Google Authenticator.

## 7. Use Cases

1. **Enabling 2FA:**
    - As a user, I want to enable 2FA on my account to enhance security.
    - As a user, I should be guided through the setup process seamlessly.
2. **Logging In with 2FA Enabled:**
    - As a user with 2FA enabled, I want to be prompted for a verification code after entering my username and password.
    - As a user, I expect the login process to be consistent across all platforms.
3. **Recovery from Lost Device:**
    - As a user, I want a clear recovery path if I lose access to my authentication device.
    - As a user, I should be able to use backup codes or contact support for assistance.
4. **Disabling 2FA:**
    - As a user, I want the ability to disable 2FA if I choose to.
5. **Mandatory 2FA for High-Risk Transactions:**

    - As a company, we may require users to enable 2FA for high-risk transactions to reduce fraud.

## 8. Functional Requirements

### 8.1 Enabling Two-Factor Authentication

- **FR1:** Users can enable 2FA from their account settings.
- **FR2:** The system will display a QR code and a manual key for Google Authenticator setup.
- **FR3:** Users must verify 2FA setup by entering a code generated by Google Authenticator.

### 8.2 Logging In with 2FA

- **FR4:** After entering valid username and password credentials, users with 2FA enabled are prompted to enter a verification code.
- **FR5:** The system validates the TOTP code before granting access.
- **FR6:** If the code is invalid, users are prompted to try again, with a limit on the number of attempts.

### 8.3 Recovery Mechanism

- **FR7:** Upon enabling 2FA, users receive backup codes to store securely.
- **FR8:** Users can use backup codes to access their account if they lose their authentication device.
- **FR9:** Users can request assistance from customer support if backup codes are unavailable.

### 8.4 Disabling Two-Factor Authentication

- **FR10:** Users can disable 2FA from their account settings after re-authenticating.
- **FR11:** The system confirms the action before disabling 2FA.

### 8.5 Cross-Platform Consistency

- **FR12:** The 2FA feature must function consistently across mobile apps (iOS and Android), web browsers, and desktop applications.
- **FR13:** User experience and interface elements should be similar across platforms.

### 8.6 Notifications and Communication

- **FR14:** Users receive confirmation notifications when 2FA is enabled or disabled.
- **FR15:** Marketing communications are sent to inform users about the availability and benefits of 2FA.

## 9. Non-Functional Requirements

- **NFR1 (Security):** All data related to 2FA must be stored securely and comply with industry security standards.
- **NFR2 (Usability):** The 2FA setup and login processes should be intuitive and user-friendly.
- **NFR3 (Performance):** 2FA verification should not noticeably delay the login process.
- **NFR4 (Reliability):** The 2FA system must be highly available with minimal downtime.
- **NFR5 (Scalability):** The system should handle an increasing number of users enabling 2FA without performance degradation.

## 10. Risks and Mitigations

- **Risk 1:** Users may find the 2FA process inconvenient, leading to decreased adoption.
    - *Mitigation:* Provide clear instructions and emphasize the security benefits during setup.
- **Risk 2:** Users might lose access to their authentication device and backup codes.
    - *Mitigation:* Implement a secure but user-friendly recovery process through customer support.
- **Risk 3:** Time synchronization issues may cause valid codes to be rejected.
    - *Mitigation:* Ensure devices use NTP for clock synchronization and provide troubleshooting tips to users.

## 11. Dependencies

- **D1:** Integration with Google Authenticator APIs and adherence to their guidelines.
- **D2:** Coordination with the design team for UI/UX elements.
- **D3:** Collaboration with the marketing team for the promotional campaign.
- **D4:** Updating customer support protocols to handle 2FA-related inquiries.

## 13. Open Questions

- **Q1:** Should 2FA be mandatory for certain high-risk user groups or transactions?
- **Q2:** What is the policy for users who repeatedly fail 2FA verification? Will there be account lockouts?
- **Q3:** How will we measure the adoption rate and success of the 2FA feature post-launch?

## 14. Approvals

- **Product Manager:** [Document Owner's Name]
- **Design Lead:** [Designer's Name]
- **Development Lead:** [SDM's Name]
- **QA Lead:** [QA Engineer's Name]
- **Marketing Lead:** [Marketing Manager's Name]

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**Note:** This PRD serves as a foundational document for the development and implementation of the Two-Factor Authentication feature using Google Authenticator. It is intended to align all stakeholders on the project's objectives, requirements, and expectations.

Please review the document and provide feedback or approval so we can proceed to the next phase of the project. If there are any additional details or adjustments needed, let me know, and I'll be happy to incorporate them.

## Product Requirement Document: Adding a Like Button to Product Listings

So, um, I'm working on adding a "Like" button to the product listing page on Snapdeal. The basic idea is that users will be able to click a heart or thumbs-up icon next to each product they see while browsing, so they can show their preference or interest in an item. I think this would help users save their favorite products, but I'm not totally sure how we'll use the data or how this fits into other parts of the site yet. I guess that's something we can figure out as we go?

The release date… um, I'm thinking it could be somewhere by the end of Q4 2024. It might take longer depending on how many other things the dev team has going on. I'll need to talk to them about timelines. I haven't confirmed the details with the stakeholders yet, but I've spoken with a couple of engineers, and they think it should be straightforward to implement since it's just a button and some backend stuff, I think?

## Background/Why We Need This

So, I thought it might be nice for users to "Like" products they see. Kind of like how they do it on other platforms like Instagram or Amazon. It might help users track their favorite items, or maybe we can do something with it later, like personalized recommendations? But for now, I'm just focusing on the button itself. I think users would find it helpful, but we don't have a lot of data to back that up. Still, it seems like a common feature on other platforms, so we should probably have it too.

## Feature Scope (I Think)

The button will appear next to each product on the product listing pages. When users click it, it should fill in or change color to show that the product is "Liked." I'm not sure yet whether the button should be a heart or a thumbs-up — maybe the design team can decide on that? The idea is for the action to be super simple — one click, and it's "Liked." If the user clicks again, it should "Unlike" the product.

I'm not really sure what happens on the backend. I assume it'll need to track which user clicked "Like" and which product was liked, so we'll need some kind of database integration? I don't know the specifics of how that works yet, but the engineering team will have to figure it out, I guess.

I also don't know how users will access the list of products they've "Liked." Maybe in their account profile somewhere? We'll need to think about that. Or maybe we can figure it out in a later release if this feature works out.

## Use Cases (Maybe?)

1. **Basic Use Case**: A user is browsing products, sees something they like, and clicks the "Like" button to remember it.

2. **Changing Their Mind**: If the user clicks the button again, the product gets "Unliked."
3. **Future Personalization**: Eventually, we might use the data from Liked products to suggest similar items, but that's not part of this right now. I think?

## Assumptions

I'm assuming this will be useful because other platforms do it. Users might expect it? But I don't have much data to prove that this is what Snapdeal users really need. Also, I assume that adding a button like this isn't too technically complicated? The engineers I spoke to said it shouldn't be too hard, but I haven't gotten a final estimate from them.

I also assume that the design team will come up with something that looks nice and fits with the rest of the site, but I'm not sure how long that'll take or if we'll need to go through a bunch of iterations.

## Risks (I Think)

There's a chance that users won't really use this feature, which would make it kind of pointless. Also, I'm not sure if we have the infrastructure to store all this extra data, so that could be a problem. I should probably check in with the database team on that. Lastly, if we don't get the UX right, the button could look out of place or just be ignored by users.

## Next Steps (I Guess)

I need to confirm the design with the design team and get feedback from the engineers on how long this will take to build. After that, I'll follow up with the marketing team to see if they think this is something we should promote, or if it's just a minor feature we'll quietly release.

# Emoji Reactions on Twitter Messages

## Current Status: On Track, M1 ongoing

**Links:** Pitch Doc | Backend Tech Spec | Frontend Tech Spec | Design Spec | QA Plan

## What are emoji reactions?

It is a new feature we are proposing which let users react to a Message — both text and media attachments with an emoji

## Why build this feature?

- **It is part of Twitter Messages Team's OKRs**
    - **OKR** - O1 from Twitter Messages Team's H2'19 OKRs: Close feature parity gaps with competition on key use cases
    - **KR** - Launch Emotion Reaction
- **Usage of Twitter Messages**
    - 150 million DAU of Twitter
    - 15 million daily unique users of Messages
    - ~10% of DAU send a Message
    - This makes Messages one of the most popular features of Twitter and something we should focus on to be the best at
- Recent report by our Data Science team showed a **strong correlation between usage of Twitter Messages with short term retention (STR)** (7 day) - New users who sent a direct message within the first 1 week had a 40% higher chance of short term retention than users who did not
    - Detailed report here
- **Improving short term retention is one of the main OKRs for Twitter in H2'19**
- Over the last one month period
    - 10% of DAU of Messages have sent an emoji as a message reply - This implies that emoji reactions can often replace the need for follow-up messages or replies in Messages
    - 14% of all message replies sent during a day are emojis
        - Currently ~37 million messages being sent daily
    - **3 most commonly used emojis (Thumbs up, The face with tears of joy, The Red heart) count as 5% of all message replies**
- **Request from users**

- **Survey findings**
    - We recently sent out a survey to 10 million power users of Messages (power users = those who have used direct message at least 10/ last 30 days, and sent 30 messages in that period)
        - Details on the survey sent and its findings can be found here
    - Ability to add emojis as a reaction counted as the 2nd most requested feature
- **Focus Group Discussions (FGD)**
    - We did an FGD in our SF office
        - Details can be found here
    - The FGD report also mentioned emoji replies as a 'must have' new feature
- **Zendesk Tickets**
    - 20% of tickets on Zendesk which are marked as Feature requests mentioned emoji reactions
        - This included requests from
            - Play Store
            - Social Media requests
            - Support requests from Twitter app

- **Competition parity**
    - Facebook introduced the ability to react to DMs more than a year ago and our competitor intel team has mentioned that 1/4th of Facebook DM users in the last one month have used an emoji reaction

## Pre Launch Data & Research

Key Numbers for Twitter Messages
Request from users: Survey findings
Request from users: FGD findings
Report on impact of Twitter Messages on STR
Feature requests on Zendesk Report

## Main User Stories

- As a user, I would like to react with an emoji to a message sent to me -
As a user, I would like to inform the sender about my reaction
- As a user, I would like the ability to undo my reaction if needed
- As a user, I would like to express positive, neutral as well as negative emotions through this reaction feature

## Goals of this feature

- Make Messages the best in class messaging product by introducing highly requested features like emoji reactions

- Competition parity
- Improve STR of Twitter users by giving the best messaging experience possible

## Success metrics

- 5% of DAU of Messages should send a reaction
    - Half of DAU of Messages who have sent emoji as a message reply - Reactions should be around 5% of messages sent daily
- Improve STR of new Twitter users by 10%

## Potential metrics watch out / impact

- Messages sent daily
    - 14% of all message replies sent during a day are emojis
    - 3 most commonly used emojis (Thumbs up, The face with tears of joy, The Red heart) count as 5% of all message replies
    - If we introduce emoji reactions #messages sent daily will be negatively impacted
    - Based on anecdotes during FGDs, users send emojis as reply when they have nothing more to say
    - Reaction is even more low friction and impersonal (arguably) and hence it might indicate to the recipient that the sender is no longer interested in the conversation. This is a hypothesis on why messages sent might do down further with introduction of reaction emojis
        - We will validate this through UTs and also data collected post launch - Unique message senders
    - Daily average of 4 million users who have sent an emoji as a message reply - Out of these 4 million, ~100k users sent an emoji as the only message during the day
    - We either need to change the definition of message senders to include emoji reaction senders or accept that this number will go down

- Short Term Retention (STR) of Twitter new users
    - Usage of Messages feature has a positive impact on STR of Twitter new users
    - Building a better Messaging product should help in improving STR - We will test impact on STR by doing an AB test
        - Control will be new users without this new reactions feature
        - Experiment variant will be the segment of new users who have access to emoji reactions
        - Detailed experiment plan can be found here
- Usage of each emoji
    - For now we are going with 7 most commonly used emojis to describe a range of emotions (from positive to negative)

- We will monitor the usage of each

## DACI

| Decision | Driver | Approver | Contributors | Informed |
|---|---|---|---|---|
| We have decided to show only 7 emojis as of now. Those emojis have been selected based on this framework | Anurag | Anurag's Boss<br>(Note: In some cases it can be Anurag himself or some external stakeholder. Depends on who is the owner of this decision) | <Add relevant people who contributed to this decision here> | <Add relevant people who have been informed about this decision here> |

# Product Requirements (The What)

| Requirement | Priority | Phase/Milestone | Status |
|---|---|---|---|
| Show Reaction button (heart and plus icon) next to the message when user hovers over the message on Mobile apps (Android and iOS) | Must Have | M1 | Done |
| React to a message by tapping the reaction button (heart and plus icon) and using the pop-up | Must Have | M1 | Done |
| React to a message by long pressing on the message and then tapping the reaction button | Must Have | M1 | Done |
| Show pop-up with 7 pre defined emojis | Must Have | M1 | Done |
| On selecting emoji, give feedback to the sender by attaching emoji with the message | Must Have | M1 | Ongoing |
| Show reaction attached with the message to the recipient | Must Have | M1 | Ongoing |
| Onboarding/ Discovery for this feature | Must Have | M1 | Ongoing |
| Send notification to recipient about this reaction by adding +1 on the Notification counter on Messages | Should Have | M2 | Yet to Start |
| Remove/undo reaction by tapping on the emoji next to the message | Should Have | M2 | Yet to Start |

| | | | |
|---|---|---|---|
| Remove/undo reaction by tapping on the same emoji on the popup | Should Have | M2 | Yet to Start |
| Counter next to emoji reaction: Needed for group messages | Should Have | M2 | Yet to Start |
| Send push notification to recipient when she gets a reaction | Should Have | M2 | Yet to Start |

# User Flows (link to mocks)



# How do we educate customers about this feature?

- <Onboarding flow for this feature come here>
- <Different hooks through which we can expose this feature to the user or remind her

about its existence come here?>

## Non-Product Requirements

| Requirement | Priority | Phase/Milestone | PIC | Status |
|---|---|---|---|---|
| Marketing: Update Twitter Blog page on Messages | Must Have | Post M3 | Marketing | Yet to Start |
| Marketing:Announce feature to the world through our social media accounts | Must Have | Post M3 | Marketing | Yet to Start |
| Start PR for this feature | Must Have | Post M3 | PR | Yet to Start |

## Out of scope for now

- Reacting to a message in the Message requests section
- Reacting with emojis other than the predefined 7 emojis launching with M1

## Configurability

- This feature should be configurable based on
    - UserIds
    - Location
    - OS
    - Device
    - User segments

# Roll out Plan

- M1
    - Alpha on 10th Nov
    - Beta on 20th Nov provided there are no major bugs or concerns in Alpha - Will launch on Prod as an experiment on 25th Nov
    - Experiment plan
- M2

- Alpha on 7th Dec
- Beta on 14th Dec provided there are no major bugs or concerns in Alpha - Will launch on Prod after we have results on M1 experiment results - Rough timeline 20th Dec

- M3
  - Alpha on 5th Dec
  - Beta on 14th Jan provided there are no major bugs or concerns in Alpha - Prod on 24th Jan

Detailed roll out plan with details on experiments we will be running
Post launch research plan comes here
Post launch impact analysis comes here

## Open Questions

- [Stakeholder from Marketing] How did we select the 7 emojis we are showing in M1 - [Anurag from Product]
  - We went through the most commonly used emojis
    - on social media in general
    - on twitter
    - on our competitors
  - Finally selection 7 to show all 3 types of emotions
    - Positive
    - Negative
    - Neutral
  - Link to the emojis and why they were selected to M1 here
- [Stakeholder from PR] Will we start shipping on Prod starting from M1? Should we wait till M3 for our PR drive around this feature?
  - [Anurag from Product]
    - We will start doing experiments starting M1
      - PR can wait till all 3 Milestones are shipped on prod

## Adding Same-Day Delivery Option for Medicines at Checkout

So we need to roll out a new feature on the checkout page that lets customers choose **same-day delivery** for medicines. The main goal here is to increase the **average transaction value** per customer. Basically, if someone knows they can get their order the same day, they'll probably buy more, which means more revenue for us.

Here's how I think this can work:

When the user reaches the checkout page, there should be an option (maybe a checkbox or toggle?) for same-day delivery. We should display this prominently, but only for eligible orders. By "eligible," I mean orders where the medicines are in stock at a nearby warehouse and it's logistically possible to get them delivered within a few hours. So the system needs to check for these conditions in real-time during checkout.

For orders that qualify for same-day delivery, we'll need to show the additional cost right next to the option. We should experiment with pricing to find a sweet spot, but maybe start with something like ₹50–₹100 extra for same-day delivery. That way, customers see the value, but it also adds to the cart value.

If the user selects same-day delivery, the **estimated delivery time** should dynamically update based on the location and stock. For instance, if someone orders at 2 PM and the medicines can arrive by 8 PM, show that time on the page. This time window should be as accurate as possible, so we might need to sync up with the logistics team to figure out what's possible.

Backend-wise, we'll need to integrate with the logistics system to pull in real-time stock levels and delivery capabilities. We also need to account for cut-off times for same-day delivery. For example, if the order is placed after 5 PM, we might need to block the same-day delivery option and let the user know it's no longer available for today.

Additionally, this feature should be **available only in certain cities** for now (probably the metros where we have the most capacity for faster deliveries). Over time, we can roll this out to more regions. The system should be smart enough to enable or disable the option based on the user's delivery address.

We should also think about how to encourage users to choose same-day delivery. Maybe we can run a limited-time promo where they get the option for free if their order crosses a certain amount, like ₹1000. This way, customers are incentivized to add more items to their cart to qualify.

I'm not too worried about the UX/UI details, but I imagine a pretty simple interface that doesn't clutter the checkout page. Something like a checkbox with the delivery charge and time estimates shown when clicked should be enough.

In terms of tracking, we need to look at two key metrics: how many people opt for same-day delivery and how much the average order value increases for those who do. If the results are good, we can iterate on the pricing and availability. Maybe we could even look into offering **super-fast 2-hour delivery** for higher fees in the future, but that's something we'll consider later.

For now, the big thing is getting the logistics integration right, making sure customers are informed of the additional charge and time window, and testing it in a few key cities to see how it impacts sales.