Product Dissection for Facebook

Company Overview:

Facebook, American online <u>social media</u> platform and <u>social network</u> service that is part of the company <u>Meta Platforms.</u> Facebook was founded in 2004 by <u>Mark Zuckerberg</u>, Eduardo Saverin, <u>Dustin Moskovitz</u>, and <u>Chris Hughes</u>, all of whom were students at <u>Harvard University</u>. Facebook became the largest social network in the world, with nearly three billion users as of 2021, and about half that number were using Facebook every day. The company's headquarters are in <u>Menlo Park</u>, <u>California</u>.

Product Dissection and Real-world Problems Solved by Facebook:

Initially, Facebook was established as a platform for users to share personal information and engage in discussions on various topics. New users can create profiles, upload photos, join a preexisting group, and start new groups. The site has many components, including Timeline, a space on each user's profile page where users can post their content and friends can post messages; Status, which enables users to alert friends to their current location or situation; and News Feed, which informs users of changes to their friends' profiles and status. Users can chat with each other and send each other private messages. Users can signal their approval of content on Facebook with the Like button, a feature that also appears on many other websites.

One of the primary features of Facebook is the ability to search for and connect with friends and family. The search interface facilitates the quick identification of acquaintances and also suggests potential connections. News Feed is another feature that enables users to view news from the connections and groups that they follow. Users can like a given post or comment on it.

The platform's group feature enables communities of interest to organize themselves, share information, images, and engage in active discussions. Users and groups can organize events that

their followers can attend using the Events feature. It enables users to send out invites and manage an attendee list.

Additionally, Facebook Marketplace is an online yard sale where users can buy and sell goods and services with other Facebook members. Messenger is an instant messaging feature that enables friends to communicate in real-time via webchat or a mobile app. Finally, Facebook Live is a feature that enables individuals and businesses to stream live video to friends, family, and followers

Case Study: Real-World Problems and Facebook Innovative Solutions

Facebook, a leading social media platform, has tackled various real-world challenges through its innovative features and user-centric approach. By addressing these challenges, Facebook has created a safer, more inclusive, and enjoyable digital environment for its users.

Problem 1: Privacy Concern and Data Security

Real world challenge: Facebook has been criticized for its handling of user data and privacy issues. This includes instances where user data was improperly shared with third party apps or used for targeted advertising without user consent.

Facebook solution:

Facebook has introduced several measures to improve user privacy, such as giving users more control over their data through privacy settings and tools, and implementing stricter policies for developers accessing user data. It allowing users to control who can see their posts, photos, and personal information. Users can also manage app permissions and ad preference. Facebook has restricted third-party developers access to user data, limiting apps can access and requiring apps to undergo a review process.

Problem 2: Cyber bully and online harassment

Real world challenge: Facebook has struggled with content moderation, including hate speech, bullying, and other harmful content appearing on the platform.

Facebook solution:

Reporting tools: Facebook provides reporting tools for users to report bullying and harassment. when a report is submitted, Facebook reviews the content and takes action if it violates the community standards.

Blocking: User can block or restrict the visibility of their posts to specific people, which can help prevent bullying and harassment from certain individuals.

AI and machine learning: Facebook uses AI and Maching learning to proactively detect and remove bullying and harassment content before it is reported by users.

Support Resources: Facebook provides support resources for user who experience bullying and harassment, including links to helplines and support organization.

Problem 3: Inappropriate content and misleading information.

Real world challenge: The platform has been used to spread fake news, misinformation, and propaganda, leading to concerns about its impact on public and democracy.

Facebook solution:

Facebook has partnered with third-party fact-checkers to review and rate the accuracy of content shared on the platform. Contents rated as false is downgraded in the News Feed, reducing its distribution. It also takes the action against fake accounts and networks that are used to spread misinformation by removing the account the reducing the reach of content posted by them.

Problem 4: Addiction and Time Management.

Real world challenge: Spending excessive amounts of time on Facebook can lead to addiction and impact academic performance and real-life relationship especially among youngsters.

Facebook solution:

Facebook provides users with an activity dashboard that shows them how much time they spend on the platform each day and week, helping them monitor and manage their usage. Users can also set daily reminder to alert them when they've reached a self-imposed time limit on Facebook, encouraging them to take breaks and limit their usage.

Problem 5: Hacking of the user's accounts.

Real world challenge: Facebook largely faced that Users accounts may be hacked or compromised, leading to unauthorized access, identity theft, or other security issues.

Facebook solution:

Facebook provide several features in order to either back or protect the account from being hacked:

Account Recovery: Facebook provides a process for users to recover their accounts if they have been hacked. This typically involves verifying their identity through email or phone number and resetting their password.

Security Notification: Facebook notifies users if it detects suspicious activity on their accounts, such as logins from unrecognized devices or locations.

Two-Factor Authentication: It offers Two-Factor Authentication to add an extra layer of security to users' accounts. This requires users to enter a code sent to their phone or email in addition to their password when logging in from an unrecognized device.

Security Checkup: Facebook prompts users to review their security settings and activity to ensure their account is secure. This includes checking login activity and updating security information.

<u>Conclusion</u>:

Facebook is a powerful social media platform that has transformed how people connect share, and communicate. However, it faced numerous Challenge, including privacy concern, content moderation issues, and criticism over its handling of fake news and misinformation. Despite these challenges, Facebook has implemented measures to address these issues, such as enhancing privacy settings, improving content moderation, and partnering with fact-checkers.

Additionally, Facebook has taken steps to address other problems, such as Cyberbullying, addiction, and account security. It has introduced features like activity dashboards, remainder, and security checkups to help users manage their time and stay safe online.

<u>Top features of Facebook</u>

Timeline: Initially, Facebook was established as a platform for users to share personal information and engage in discussions on various topics. As time progressed, the platform underwent several enhancements, including the introduction of Timeline. The Timeline feature replaced the Facebook wall, which was the original hub for user profiles and updates. The user timeline encompasses posts, status updates, friend listings, photos, videos, and user activity information.

Friends: One of the primary features of Facebook is the ability to search for and connect with friends and family. The search interface facilitates the quick identification of acquaintances and also suggests potential connections.

News Feed: It is another feature that enables users to view news from the connections and groups that they follow. Users can like a given post or comment on it.

Pages: Businesses can create profile and content pages on Facebook, known as Pages, to share information and communicate with customers.

Games: Facebook also provides an integrated capability for users to play games on their own or together with friends.

Groups: The platform's group feature enables communities of interest to organize themselves, share information, images, and engage in active discussions.

Events: Users and groups can organize events that their followers can attend using the Events feature. It enables users to send out invites and manage an attendee list.

Marketplace: Additionally, Facebook Marketplace is an online yard sale where users can buy and sell goods and services with other Facebook members.

Messenger: Messenger is an instant messaging feature that enables friends to communicate in real-time via webchat or a mobile app. Finally, Facebook Live is a feature that enables individuals and businesses to stream live video to friends, family, and followers.

Schema Description for Facebook

The schema utilized by Facebook comprises numerous entities that embody distinct facets of the platform. These entities encompass Users, Posts, Comments, Likes, Followers, and several others. Each entity possesses particular attributes that defining its characteristics and relationship with other entities.

User entity:

- **User ID (Primary key):** A unique identifier for each user.
- **Full name:** The User's full name as displayed on profile.
- **Username:** The chosen username for the user's account.
- **Email**: The user's email address for account related-communication.
- **Gender:** Gender of the User
- **D O B**: Date of birth on Facebook to inform our friends about birthday.
- **Bio:** A brief description that users can use to express themselves.
- **Registration Date:** The date when the user joined Facebook.

Post entity:

Posts capture the visual content shared on the platform.

- **Post ID (Primary Key):** A unique identifier for each post.
- **User ID (Foreign Key referencing User Entity**): The user who created the post.
- **Post Date**: The date when the post was created.
- **Location**: The tagged location associated with the post.
- **Content:** Text accompanying the post, providing context.
- **Post Type:** Tells whether the post is image, video or other multimedia.

Comment Entity:

Represent a comment made by the user.

- **Comment ID (Primary key**): A unique identifier for each comment.
- **Post ID (Foreign Key referencing Post Entity**): The post being commented on.

- **User ID (Foreign Key referencing User Entity)**: The user who posted the comment.
- **Content**: The text of the comment.
- **Comment Date**: The date when the comment was posted.

Likes Entity:

Likes represent user appreciation for posts.

- **Like ID (Primary Key):** A unique identifier for each like.
- **Post ID (Foreign Key referencing Post Entity):** The post being liked.
- **User ID (Foreign Key referencing User Entity):** The user who liked the post.
- **Like Date:** The date when the like was registered.

Chat Entity:

Represent messages send between the users.

- **Message ID (Primary Key)**: A unique identifier for each message.
- **Sender ID (Foreign Key referencing User Entity):** User who send message.
- **Recipient ID (Foreign Key referencing User Entity):** Users who received messages.
- **Content**: Text content of the message.
- **Chat time**: Time when the message was sent.
- **Read Status**: Whether the message has been read.

Notification Entity:

Represent a notification send to a user.

- **Notification ID (Primary Key):** A unique identifier for each notification.
- **User ID (Foreign Key referencing User entity):** User who receive the notification.
- **Type:** Type of notification weather it is a like, comment, message, tags.
- **Content**: Text content of the notification.
- **Notification time**: Time when the notification was sent.
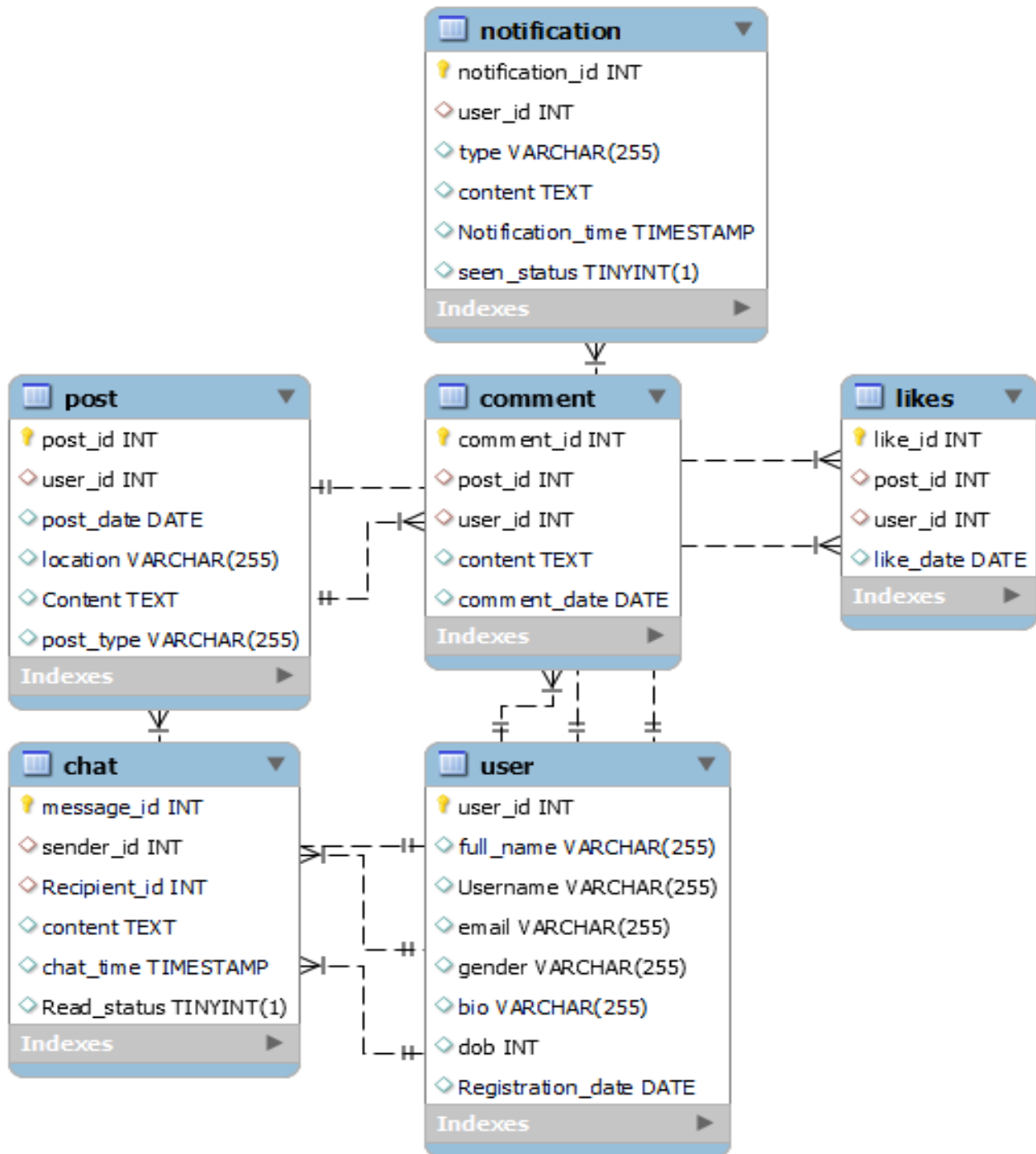- **Seen status:** Whether the notification has been seen.

Relationship Are:

> **User-Post:** One user can create multiple post. One post is created by one user.

➢ **User-comment**: One user can write multiple comments. One comment can be written by one user.

➢ **User-like:** One user can like multiple post or comments. One post or comment can be liked by multiple users.

➢ **User-Chat:** One user can send multiple messages. One message can be sent by one user or received by one or more other users.

➢ **User-Notification**: One user can receive multiple notification. One notification is received by one user.

➢ **Comment-like:** One comment can have multiple likes. Each like is for one comment.

➢ **Post-Comment**: One Post can have multiple comments. Each comment belongs to one post.

➢ **Post-like:** One post can have multiple likes. Each like is for one post.

➢ **Post-notification**: One post can generate multiple notifications. Each notification is related to one post.

ER Diagram

The ER Diagram provide overview of the entities and their relationship within the Facebook schema. It serve the visual representation of various components and their connection, facilitating a better understanding of Facebook's data model and interactions between users and content on the platform.

notification
- 🔑 notification_id INT
- ◇ user_id INT
- ◇ type VARCHAR(255)
- ◇ content TEXT
- ◇ Notification_time TIMESTAMP
- ◇ seen_status TINYINT(1)

Indexes ▶

post
- 🔑 post_id INT
- ◇ user_id INT
- ◇ post_date DATE
- ◇ location VARCHAR(255)
- ◇ Content TEXT
- ◇ post_type VARCHAR(255)

Indexes ▶

comment
- 🔑 comment_id INT
- ◇ post_id INT
- ◇ user_id INT
- ◇ content TEXT
- ◇ comment_date DATE

Indexes ▶

likes
- 🔑 like_id INT
- ◇ post_id INT
- ◇ user_id INT
- ◇ like_date DATE

Indexes ▶

chat
- 🔑 message_id INT
- ◇ sender_id INT
- ◇ Recipient_id INT
- ◇ content TEXT
- ◇ chat_time TIMESTAMP
- ◇ Read_status TINYINT(1)

Indexes ▶

user
- 🔑 user_id INT
- ◇ full_name VARCHAR(255)
- ◇ Username VARCHAR(255)
- ◇ email VARCHAR(255)
- ◇ gender VARCHAR(255)
- ◇ bio VARCHAR(255)
- ◇ dob INT
- ◇ Registration_date DATE

Indexes ▶

Conclusion

In the present case study, we have undertaken an in-depth analysis of Facebook's schema and Entity-Relationship diagram. Facebook has brought about a revolutionary change in the manner in which individuals share and interact with visual content, thereby promoting connections and creative expression. The platform's intricate data model, comprising of entities such as users, posts, comments, likes, followers, and pages, serves as the bedrock for its seamless functionality. By comprehending this schema, we acquire a profound understanding of how Facebook efficiently manages the intricacies of user interactions and content sharing, thereby contributing to its widespread popularity and sustained growth in the realm of social media.

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