

Data Models and Query Languages(CSE 560): Project1: TinyTwitter

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1 Entity Relation Schema:

- In the project TinyTwitter there are different entities as Account, Followers and Followings where Account contains all the information about Account and the Followers and following contains information about account's followers and following. There is HAS relationship between Account and Followers, Following to illustrate that Account has Followers and Followings. A account can have multiple followers and followings so the relationship between Account and Followers, Followings is One-to-Many relationship.
- Also other than Followers and Following, Account has Posts relationship with Drafted tweets and Tweets which illustrate that the Account user posts Tweets or the Account user can save tweets which are in draft stage. The relationship between Account and Drafted tweets is One-to Many as, One account user can save many tweets as drafts also the relationship between Account and Tweets is also One-to-Many as a Account user can post multiple tweets.
- Tweets also have HAS relationship with Comments, Retweets and Like as a Tweet can have many comments, retweets and like by other users or by himself. The relationship between Tweets and Retweets also between Tweets and Comments is a One-to-Many relationship as, A tweet can have can have Many Comments and Retweets for itself.
- Account have relationship with Comments, Retweets and Likes as, Account user can Retweet on the tweet posted by another user or can comment on the tweet posted by another user and also can like the tweet posted by another user. This relationship is shown through the entity tweets as all of these functionality is implemented on tweets.

2 Relational database schema:

Entity relationship schema is mapped to relational database schema in following ways:

- For entity Account a table is created named account with user_id as a Primary key. This table will store all the information related to the account as, Display name of account, Password, Email_id, Information about User, Date on which account is created and the date, time when the account was logged in last time.

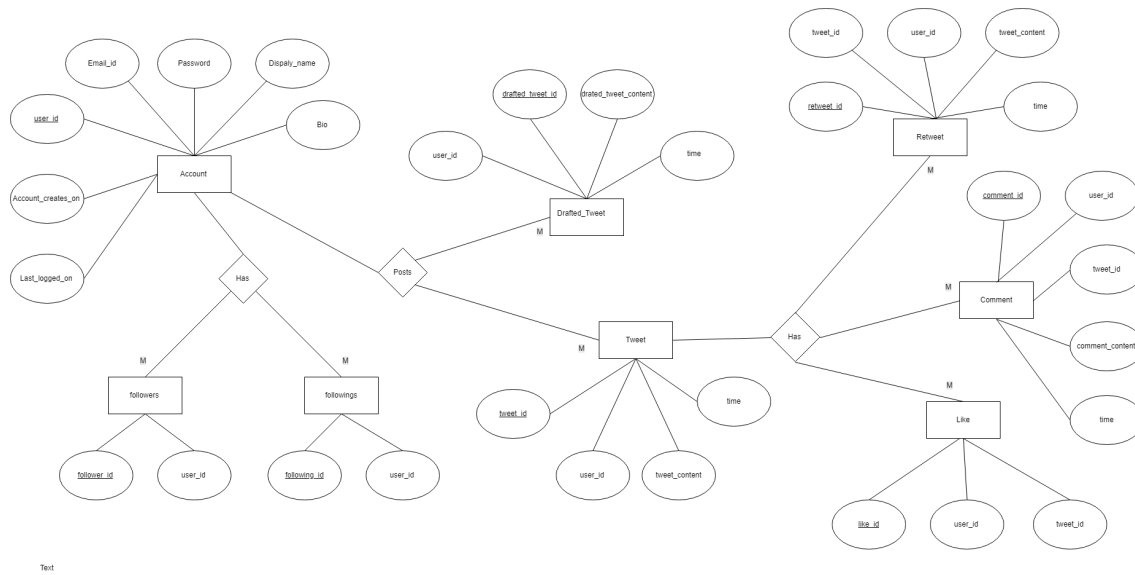


Figure 1: Entity Relationship diagram for TinyTwitter

- To store the information regarding Followers and Followings two separate tables are created as Follow to store information regarding followers and Followings to store information regarding the accounts the account user following.
The Follow table stores the user_id of the account users who follow the account in the column 'follower_id' and the user_id of the account in 'user_id' columns. The Followings table stores the user_id of the account users to whom account user is following in the column 'following_id' and the user_id of the account is stored in the 'user_id' column. Where Followings.id is the primary key for the table followings and Follower.id is the primary key for the table Follow. user_id is the foreign key present in both tables references to the account table.
- The Tweet table is created to store the information about the tweets that the account has posted. The table contains the information as Contents of tweet, user_id of the user who posted the tweet, Tweet.id of the tweet which is also primary key of the table and time at which the tweet was posted. user_id is used as the foreign key in the table tweet which references to the table account.
- The drafted tweet table stores the content of the drafted tweets along with the drafted_tweet_id which is primary key of the table. Also, it stores user_id of the user who drafted the tweet which happens to be the foreign key of this table which references to the Account table.
- A tweet can have Retweets, Comments and Like. To store this information of the tweet 3 tables are created as,
Retweet which stores the information about the retweets posted on the tweet. The tables stores the retweet id of the retweets which is primary key of the table along with the content and time of the tweet. tweet_id is a foreign key which is used to reference the table tweets and user_id is another foreign key used to reference the table account.
Comment table stores the information about the comments posted on a tweet such as content

of the comment, time at which the comment is posted, the tweet id of the tweet on which the comment is posted also user id of the account who posted the comment. Here, tweet_id is the foreign key used to reference the table tweets and user_id is used to reference the table account.

Like table stores the information as the tweet_id of the tweet which has been liked which is also foreign key to reference the table tweet and user_id of the account who liked the tweet which references to the account table. like_id is used as a primary key of the table.

- The relational schema satisfies the requirements as follow:
- Username, password and display name are stored with type strings, where is the username is nothing but the email_id of the account user.
- The display name is marked as Unique so that it will reference to only one account and no two accounts can have same display name.
- The Email_id is made unique so that two accounts can not have same email id and one email id corresponds to only one account.
- The requirement of the Time, Content and drafted tweets is satisfied by storing time and content of the tweets in the table tweet and for drafted tweets another table named drafted_tweet is created which stores the content of the drafted tweet.
- To implement user relationship two other tables are also created as follow and followings which store the information of the accounts to whom account user follows. So the user can see their tweets, retweets and comments by referencing the tweet_ids and user_ids of the users and tweets.

3 Relational database schema:

Advantages: In this model the information about the retweets, comments and the like posted by the user are stored in the retweet, comment and like table so that we don't need to create another table for this which store the information for user. We can get this information by directly referencing these tables as we have included user id as the foreign key in these table. This saves the cost of the model and reduce the number of tables.

Disadvantages: As mentioned in the Advantages section the model do not have separate table to store the information about users activity we use the tables retweets, comment and like but referencing these table and retrieving the data from these kind of table is time consuming.