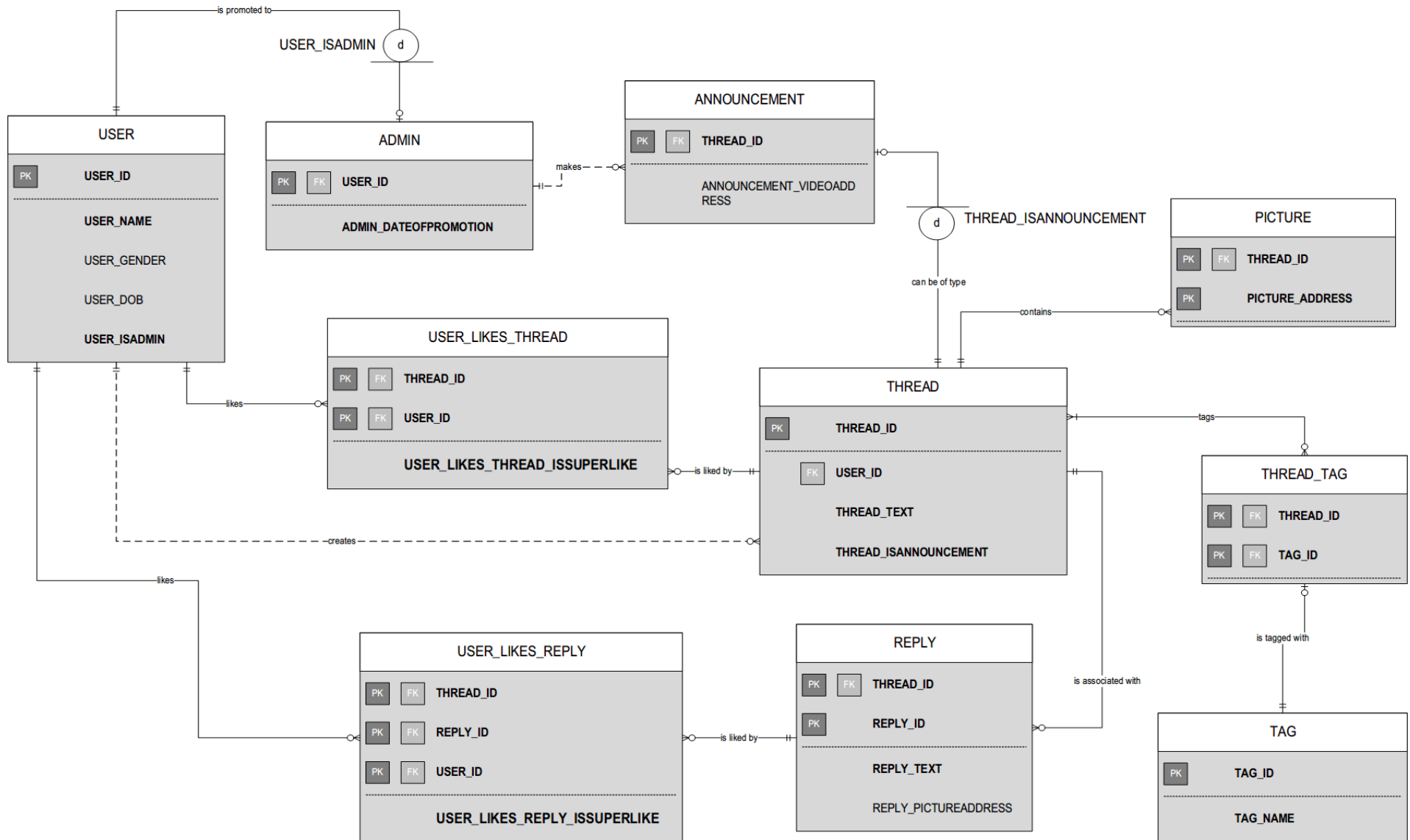


DB Assignment 1

By Siddhesh Rajiv Karekar, karekar@usc.edu

The E-R Diagram



Entities and Attributes

User

Models the basic user entity with most information as optional.

Admin

The only key, `USER_ID` is also a foreign key. This relationship can also be modeled without the need of a separate table, since it only has one attribute (about the date of promotion), but since it is a 1-1 relationship, it is more intuitively depicted with a separate table.

Thread

Must be linked to a `USER` and contain text. If the linked user is an `ADMIN`, it may be an `ANNOUNCEMENT`. It is linked to Tag and Picture as described below.

Announcement

It is essentially an upgraded `THREAD` with the ability to optionally contain a single `VIDEOADDRESS`.

It can only be created by `ADMINS`. This relationship is depicted by the weak relationship between `ADMIN` and `ANNOUNCEMENT` in the design but is handled differently in the implementation, due to their respective foreign keys being inherited from `USER` and `THREAD` respectively.

Reply

Is uniquely identified only with its corresponding `THREAD`. Must have text, and optionally a single address to a picture. (These are independent of `PICTURES` of a `THREAD`, and hence not linked to that table.)

Tag

`TAGS` have an ID and a name in this design and are strong and independent. `THREAD` and `TAG` have an M:N relationship which is resolved into the `THREAD_TAG` entity.

Picture

1 thread may have 0 or more `PICTURES`.

For the threads, the existence of a picture depends entirely on the threads – in this design, a picture cannot exist on its own, hence it is a weak entity as shown.

Like

A `USER` can like a `THREAD` or a `REPLY`, and these are modeled as 2 separate M:N relationships, resolved respectively into the `USER_LIKES_THREAD` and `USER_LIKES_REPLY` entities. The only non-key attribute is `IS_SUPERLIKE` which models whether that `LIKE` is a 'superlike'.

Relationships

1:1

- A single USER may be promoted to a single ADMIN (“may” implying a row in USER may be linked to 0 or 1 ADMIN rows)
- A single THREAD may be of type ANNOUNCEMENT

1:M

- A USER can make 0 or more REPLIES
- An ADMIN can make 0 or more ANNOUNCEMENTS
- A THREAD can contain 0 or more PICTURES
- A THREAD can have 0 or more REPLIES

M:N

All M:N relationships are decomposed into two 1:M relationships by resolving them into an intermediate entity, these include

- Multiple USERS being able to like multiple THREADS
- Multiple USERS being able to like multiple REPLIES
- Any THREADS being able to be associated with any number of TAGS

Design Choices

Specialization

As stated above, an ADMIN is a specialized USER, and an ANNOUNCEMENT is a specialized THREAD (the latter is not described in the problem statement but can be inferred from the given information.)

Required Attributes

Modern forums do not mandate a user to fill in all their information to make the experience for the users as comfortable as possible. Accordingly, as many attributes as possible have been left optional unless absolutely required.

Multi-Valued Attributes

Since all many-ended relationships are resolved into separate entities when required (such as USER_LIKES_THREAD) there are no multi-valued attributes.

Strong and Weak Relationships

Although weak relationships are preferred, many of the entities in this scenario depend on a few others for their existence, and hence many relationships in this design are strong.

In this design, USERS, THREADS and TAGS exist independently.