ITOM6265 Database Management

Final Project

Group18

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Like-minded

I. Database Application Overview

Nowadays, people tend to connect with others who are outside of their daily social circles with the same common interest, so our team designed a database application that provides a platform containing information about group events that are classified into a variety of categories for users to explore and join in major US cities, such as cities in CA, IL, NY. We named our app as Like-minded and our slogan is "Life is an event, make it memorable", because we hope our users can search for groups or events to join based on the topics that they are interested in, find like-minded people and make memories. Users can create new groups if there are no matches with their interests. Through Like-minded, our team can also gather insights on trending topics and event distribution from data collected.

The data was found from Kaggle - Kaggle Data, which was collected using Meetup API.

II. Project Scope

Our database includes several entities, details associated with the event planning includes: Categories

- Groups
- Member groups
- Events
- Members
- Cities
- Venue

Like-minded serves as a search engine for the end-users to access information about categories, groups, and events in the database and it helps users to find and join groups related to their interests and make new friends. Through the user interface, users are able to perform searches on categories and groups based on factors such as location, group rating, personal interests. As a result, users will get a list of events that match their search criteria and location shown on a map.

Our database includes several entities to show the activity information. Some of the important metrics include category, group, member, and city. We will also create an additional analytics dashboard to monitor users' activities and generate insights on member enrollment and interest groups.

III. Project Goal

The intended users for Like-minded include both internal and external users. External users are people who are looking for interest groups and events to join and others to network. Through this search engine, people are given access to information about different categories, groups, and events that arouse their interest, though visualizing the events information on the event dashboard enables users to network more effectively and better explore the opportunities. In addition, Like-minded also provides a platform for users to store member information, manage their interested

groups or create new groups or events if they can find any groups or events of interest after signing up. Besides, Like-minded can be analyzed internally to generate user insights through graphing the relationships among entities in an interactive analytics dashboard. Our team can cooperate with marketing agencies and provide insights that enable them to target customer segments and identify customer interest trends to tailor marketing campaigns, thus optimizing advertisement costs on different marketing channels.

IV. Entity Relationship Diagram Design

1. Conceptual Design

We create seven entities listed below for our database.

- **Categories** – Category information, such as category_id (primary key) and category_name
- **Groups** – Group information, such as group_id (primary key), group_name, rating and group_photo_link
- **Events** – Event information, such as event_id (primary key), event_name, and event_description
- **Venues** – Address information for each event, such as venue_id (primary key), address and city
- **Members** – Member information, such as member_id (primary key), city, email, and password
- **Cities** – City information associated with each group, such as city_id (primary key), city, latitude, and longitude
- **member_group** – An associate entity between Groups entity and Members entity

2. Logical Design

1) Reason

The goal of our shiny app is to bring people together to explore activities that they are interested in. Therefore, Categories Entity is first created to separate interests into multiple categories. Groups Entity and Events Entities are then created so that users/members are able to identify groups and activities that interest them most and join events accordingly. Members Entity is critical because it contains detailed information of users/members, which helps keep track of user behavior and generate user insights for us. Cities Entity and Venues Entity contain location information, which can be used in data visualization analysis, such as creating interactive maps. The last entity is called member_group, working as an associative entity to better illustrate many-to-many relationships between Members Entity and Groups Entity.

2) Transformation

- One-to-many Relationships

One category can have many groups, while one group can only belong to one category. One group can create many events, while an event can only be created by one group. One city can have many groups and members, while one group and one member can only be associated with one city. One venue can host many events, while only one event can be host at one venue.

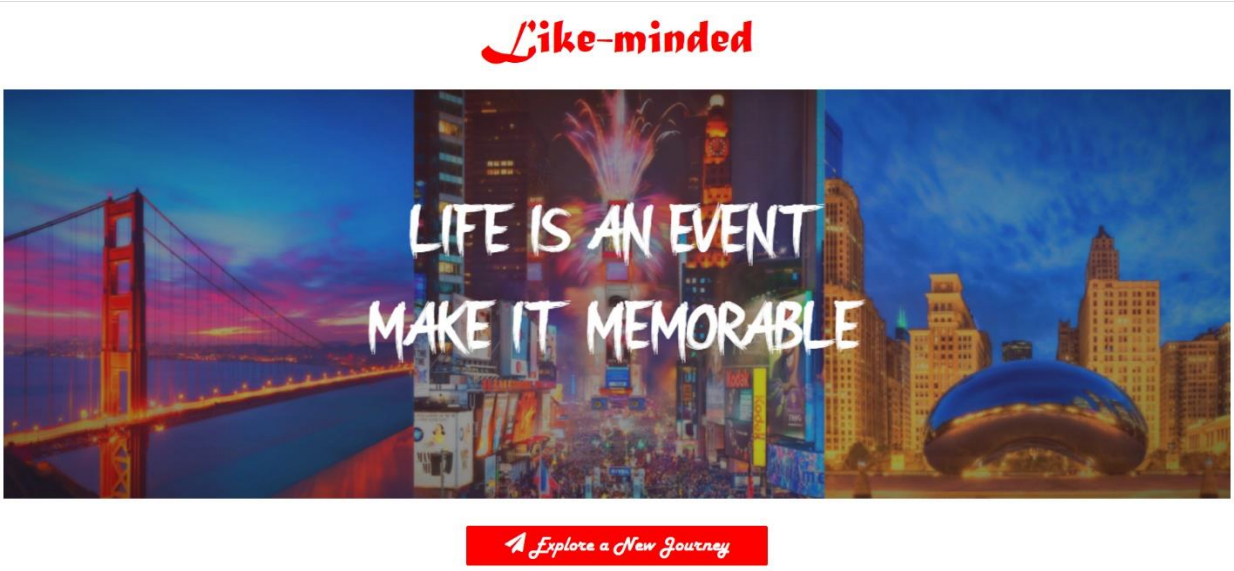
- Many-to-many Relationships

One group can have many members and one member can join multiple groups. However, this many-to-many relationship is implemented by adding an associative entity called member_group, which includes member_id and group_id.

- Normalization

We normalize our database relationship to the 3rd normal form. First, there are no multivalued attributes. For example, group name and group description are separated into two attributes. Second, every non-key attribute is fully functionally dependent on the entire primary key. Each entity has a unique primary key and no composite key exists. Third, there are no transitive dependencies. The primary key in each entity is not a determinant for another attribute.

V. Shiny User Interface



- Cover page

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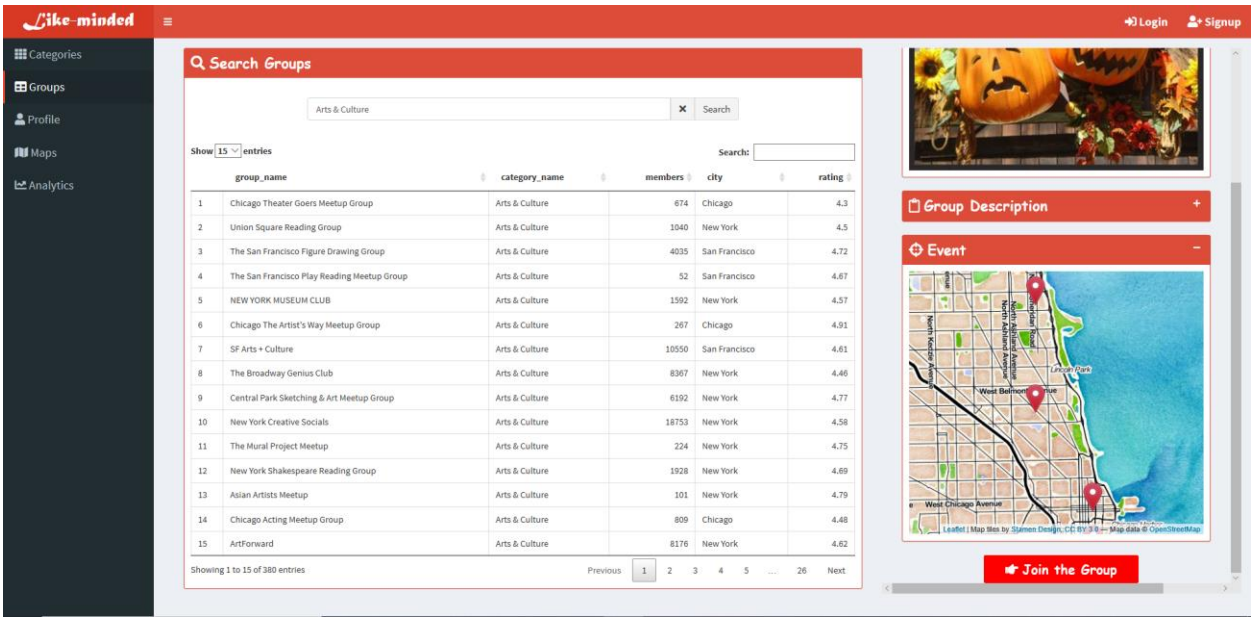
- Most Popular Categories: Top-ranked categories by number of groups, clicking on any image would lead to the Group tab, showing all groups within the category.

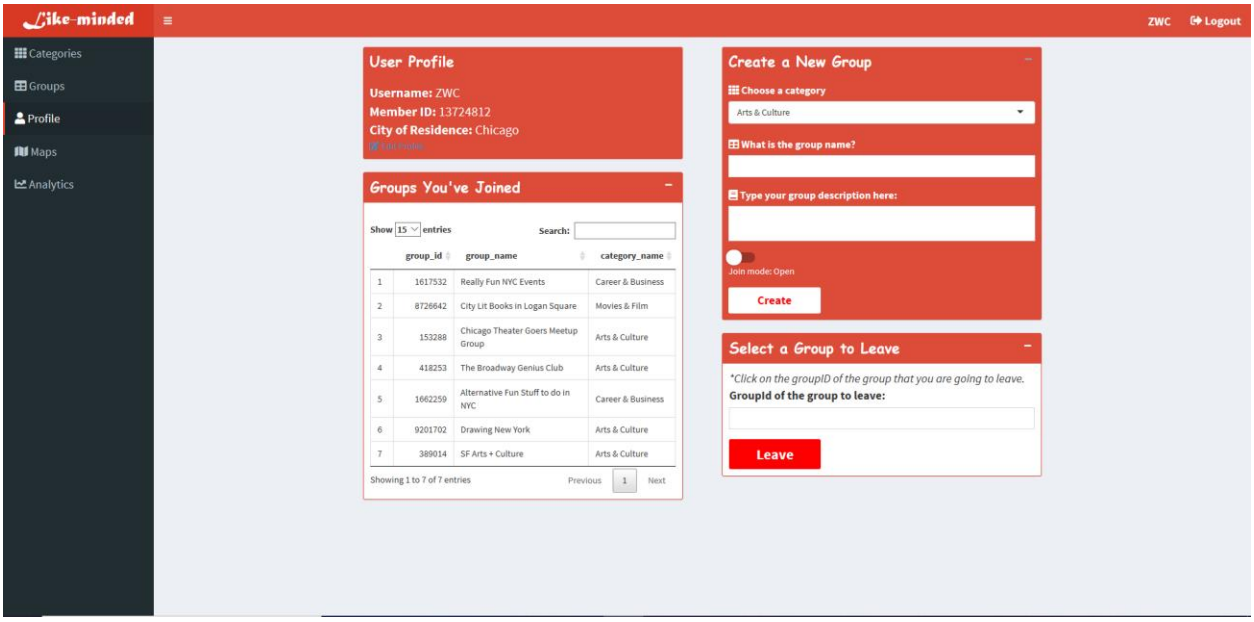
- Bottom-left is the alphabetically-ordered table of categories. Clicking on any of the categories, the bottom-right table would display the first five groups within the category. Clicking on "see all groups" leads to the Group tab, showing all groups within the category.



- Users can use the search bar to do the fuzzy search for either categories and groups. The small search box under the main search bar allows the user to do further detailed search within the result table.

- On clicking on the group name in the left-hand-side table, the right-hand side would display details including the group photo (top box), group description and the events held by the group. The bottom two boxes are collapsible and initially collapsed.

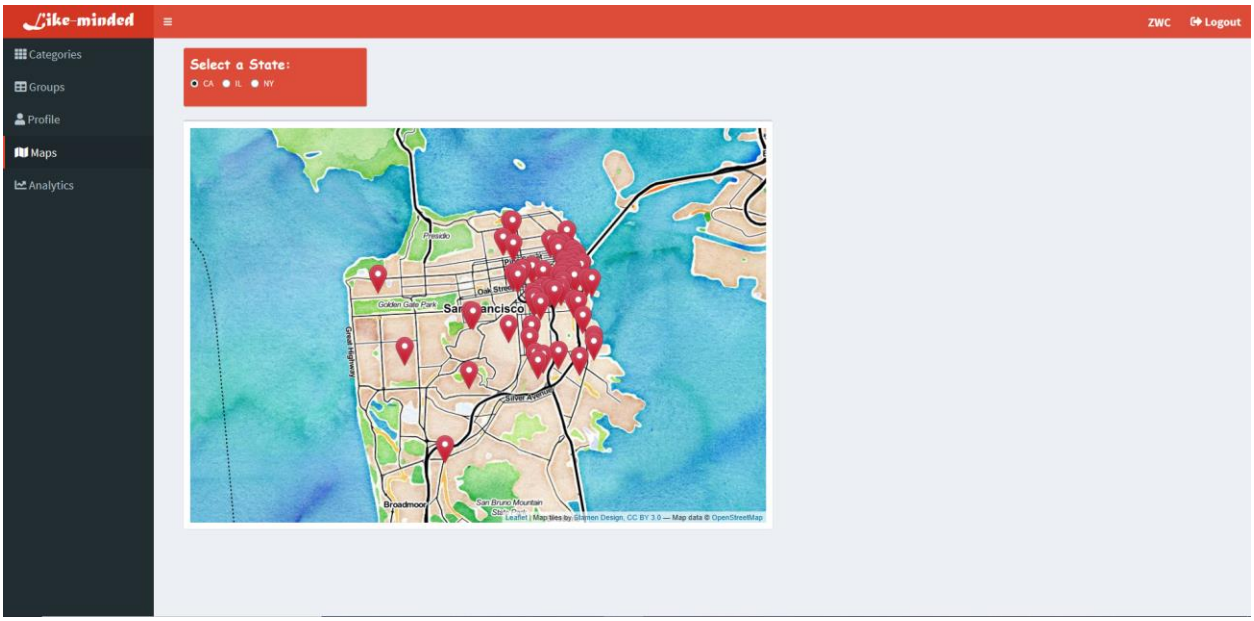
- If a logged user is interested in the selected group, he can click on the "join the group" button. If a non-logged user clicked on the button, a warning message would pop up asking the user to log in before joining the group. If a logged user had already joined the group, a warning message would pop up noticing that the user has already been in the selected group.



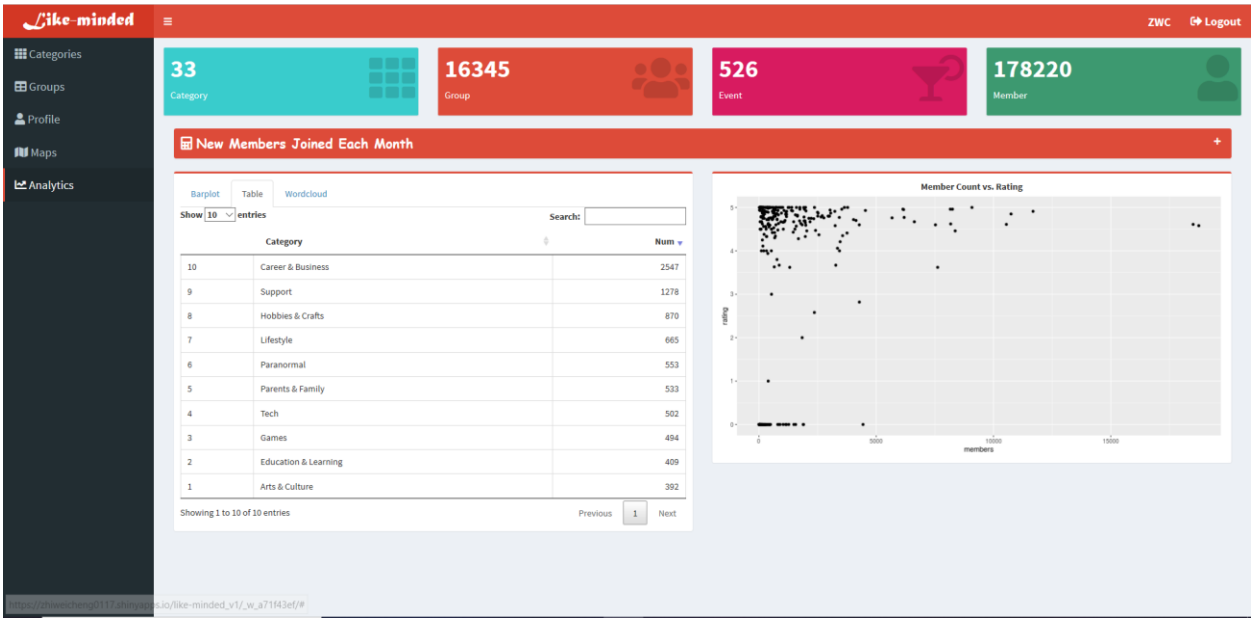
- Items on the Profile tab would not be visible until the user logs in. Top-left box contains the user profile, below which is an "edit profile" link allowing the user to change the user name and the city of residence.

- The bottom-left box displays all the groups that this logged user has joined in. To leave a group, the user can click on the group number which would be shown in the bottom-right box, and then click on “leave”.

- Considering that a user might like to create a new group on his own interest, we have the "create a new group" box to satisfy such demand. The user can select a category for the group, type in the group name and group description, and click on "Create" to create a new group. In this case, the member ID would be stored as an organizer ID in the database.



- The Map tab essentially contains the location information of all the events, sorted by states.



The analytics tab serves as a performance monitoring tool for Like-minded management team to have an overall picture of how popular the application is and get insights on users' preferences and activities.

The top section of the analytics tab contains 4 key performance indicators tiles, category, group, event, and member to present a quantitative measurement of primary components of the application. The numbers will change with the insert of new records.

The middle section of the tab is a scatter plot of the new member enrollment count for each month. It provides a view of enrollment in a time series plot, which can be used in analyzing trends and seasonality. For example, the plot shows that the low month and high month for members enrollment is December and January, respectively. Like-minded management team can launch promotions or increase marketing efforts accordingly. The plot can be expanded collapsed based on visual needs.

The bottom left corner is a graphing analytics section that contains three different types of visualization of category popularity, which are bar plot, table, and word cloud. The bar plot shows top categories ranked in descending order by the number of groups within each category. The management team can change the parameter to select how many categories they want to see on the plot.

The filter also applies to the table tab, which presents the same information as the bar plot but in table format. In addition, each category can be clicked then used as a filter to the member count vs. rating scatter plot on the lower right corner. This scatter plot shows the correlation between the number of members for each group within a category and groups' ratings.

The third tab within the graphing analytics section is a word cloud analyzing the category popularity. The bigger the size, the more groups there are within a category. Also, if the management team hover the mouse on the category name, it will show the number of groups.

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Appendix

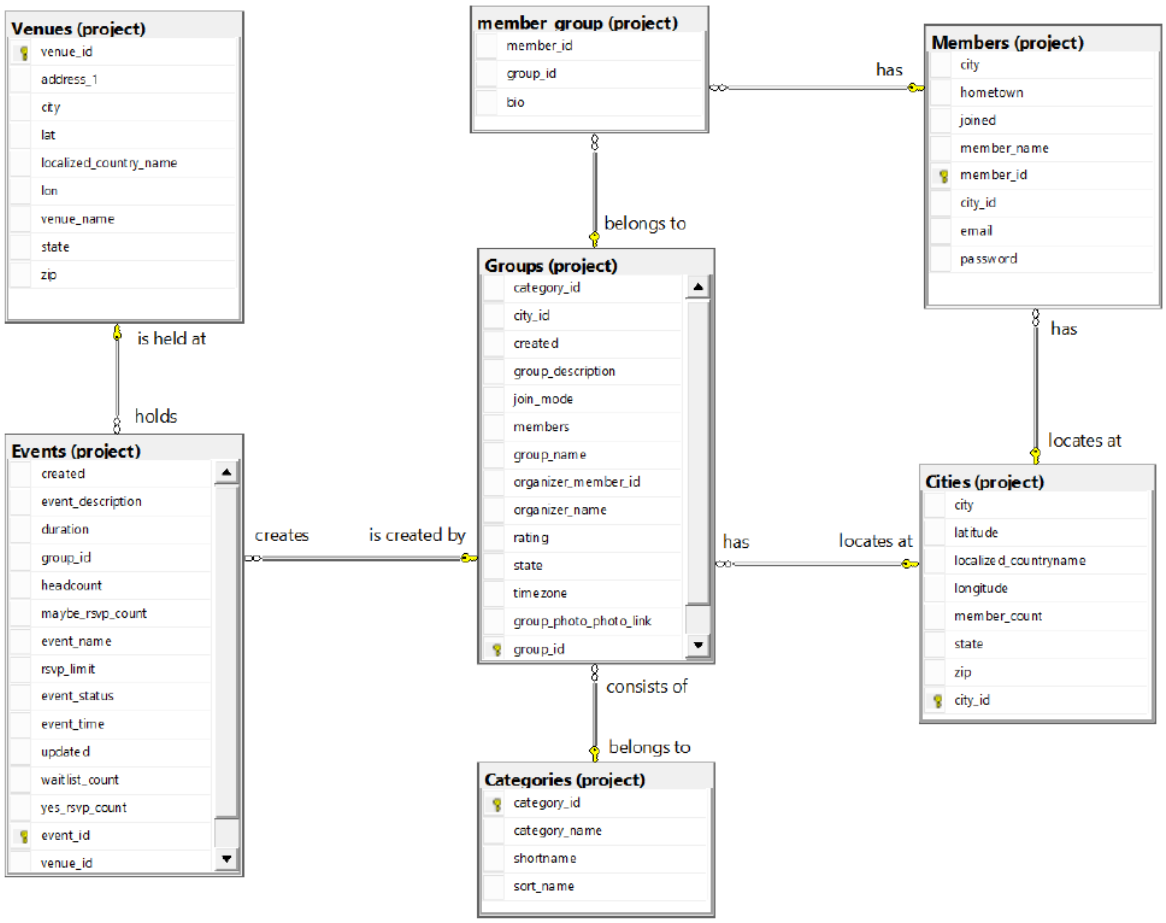

Exhibit 1 - Entity Relationship Diagram

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Exhibit 2 - Relationship

- A Categories consists of one or many Groups
- A Groups belongs to only one Categories
- A Groups creates one or many Events
- An Events is created by only one Groups
- A Cities has one or many Groups
- A Groups can be located at only one Cities
- A Cities has one or many Members
- A Members can be located at only one Cities
- A Venues can hold one or many Events
- An Events can only be held at one Venues
- A Groups can have many Members
- A Members can belong to many Groups

Exhibit 3 - Data Dictionary

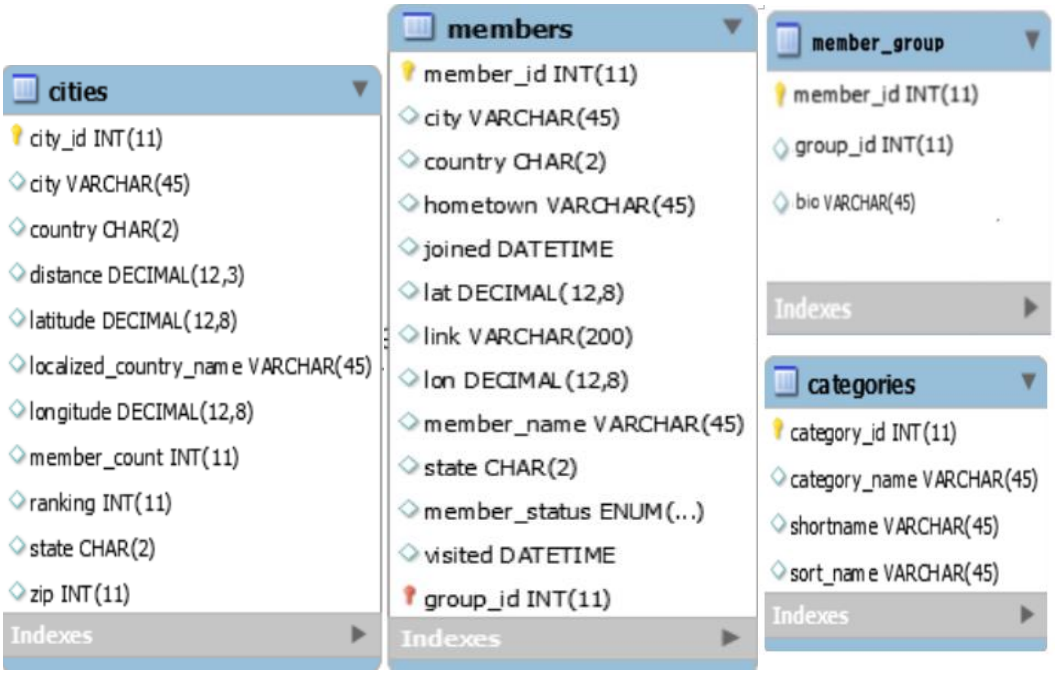

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Exhibit 3 - Data Dictionary (Cont.)