Object-Oriented System Analysis, Modeling, and Design (ITMT-531-02)

Assignment #4 –Developing ER Diagram of Artist Experience App.
Sharing Key Pain Areas during the journey.

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ER Diagram

In the field of Database management, ER diagrams are used as fundamental tools in the database development life cycle to design, maintain, and operate the system.

Description on the ER Diagram

Entities and their relationship is listed below. Let's consider a scenario where Dan is logging in to the App(since he is the producer and a co-founder of the app, he has a few extra features other than the normal users). Dan has a specific user account.

1. User Account – The user account has credentials such as email ID and password to log in.

   Relationships:

   Many users can have optional premium

   One user can have multiple playlists.

2. Premium- Every user including Dan can take up premium to avoid ads and improve streaming quality for premium members.

   Relationships:

   Premium members can listen to multiple genres without ads.

   NonPremium members have to view multiple ads while switching music.

3. Ads- Ads are played to users without a premium in between the playlist.

   Relationships:

   One Ad can have multiple algorithms. (This can only be seen through Dan's App and not the user's app since Dan is a co-founder.)

   One Ad can play between multiple Mix(song)

4. Genre: Genre describes the type of music entity. Describes Genre ID and Genre Name

Relationships:

One Genre has multiple artists in its entity.

5. Artists: Artists describe data of the artists which is Artist ID that is specific to each artist and their name and about their biography.

Relationships:

One Artist to many Artists Music as he creates multiple songs.

One Artist to many trends as each of his songs can create multiple trends.

6. Trends: As the name of the entity suggests it describes the current trending music scene. For Dan(as he is a co-founder) an extra feature is set that describes the information called Trend Analytics which shows Top songs and emerging artists etc,.

Relationships: A lot of feedback from the listeners can contribute to Trends. Best songs listed by multiple users becomes number 1 Trending.

7. Playlists: Playlists describe a set of songs that is sorted by the user. Each Playlist has Playlist_ID, the Title of the playlist, and its description.

Relationships:

Each Playlist will have many Artists.

8. Gen AI Music: This entity is only accessible to DAN and not other users. Gen AI music is a prebuilt AI-generated music having GenAI ID that represents the ID key of the each sound.

Relationships:

One GenAI music sound can help and is connected to multiple DAN compositions.

9. DAN composition: This entity is only accessible to DAN and not other users. DAN composition has a certain set of music that is professionally made by DAN and GENAI to enhance the quality of music.

Relationships:

ONE DAN Composition is used to create ONE Mix avoiding COPYRIGHT issues.

10.Artist Music: This entity is only accessible to DAN and not other users. This entity describes the music composed by a feature Artist who wants to collaborate with DAN.Unlike, artist entity Artist music entity has Music made my artist and not just the biography them. This entity has Artist ID that describes artist has SongID that describes the Song made by artist.

Relationship:

ONE Artist Music is used to create ONE Mix avoiding COPYRIGHT issues.

11. Mix: Mix describes the Final Music that has Artist's composition with DAN and GENAI composition that is put on the charts for the listeners. Mix ID describes Mix music ID and Music name describes the name of the music similarly Mix Description ID describes date information and time span of the music.

Relationships:

One Mix music is shared across multiple platforms, so one mix music to many share relationship.

12. R & D: This entity is only accessible to DAN and not other users. This describes Research and development that is done to improve the application effectively. Research ID represents research and development ID of the algorithm

Relationships:

Many Researchers contribute to one Algorithm.

13. Security: This entity is only accessible to DAN and not other users. This describes security patches that help the hackers not to breach into the system or viruses to not corrupt the data. Containing Security ID.SecType ID describes features of the security patch and description about it.

Relationships:

One Security patch to many Algorithm.

14. Share: This entity describes the sharing of mix music in multiple areas such as social media and directly sending the link of the mix music to other listener.

Relationships:

One Share can have many feedbacks as people have many opinion on one song.

15. Feedback: Feedback describes the opinion of the listeners on the mix music. Each feedback has an ID and description of its own.

Relationships:

One feedback on the song can affect many trends. For example, one negative feedback on the song can get the song below in the charts of No.1 Trending,No.1 Trending in recent releases etc,.

16. Algorithm: This particular entity is only accessible to DAN as he is a co-founder and will not be visible t general users or premium users. This describes the type of algorithm that is used to set up the app and generate revenue using ads and other activities.

Relationships:

Many Algorithms can make up one ad posting

One Algorithm is connected to many developers in R&D.

There are certain designs that are added to describe the user interface of DAN as a co-founder.But as a premium or normal user entities which are mentioned will not be seen or accessible.

Those entities are listed below.

1.GenAI music

2.Dan Composition

3.Artist Music

4.Mix Music

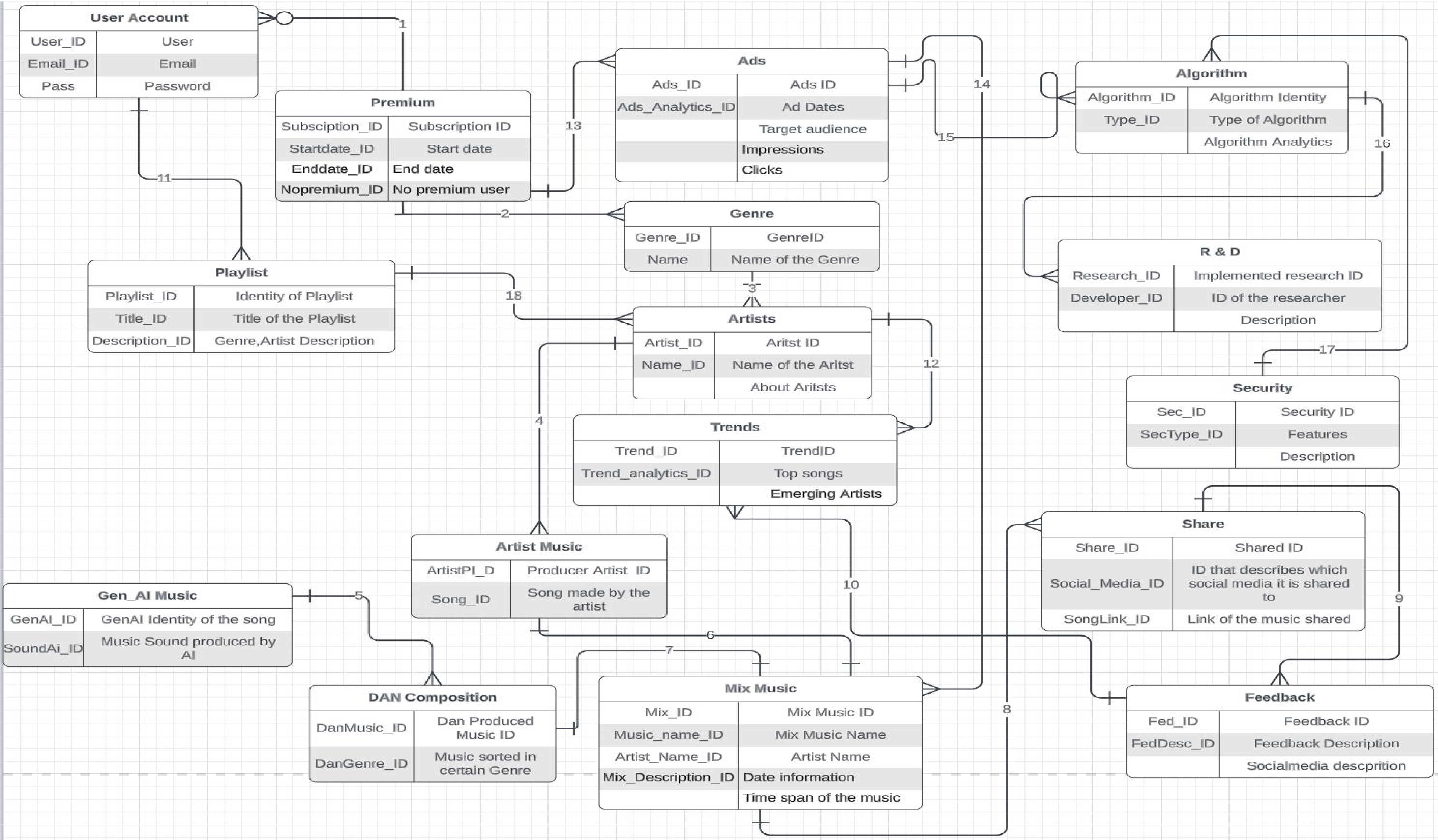
5.Algorithm

6.R&D

7.Security

Please find the ER Diagram on the next Page.

NOTE- IN THE ER DIAGRAM NUMBER 1- 10 IN THE RELATIONSHIP LINE DEPICTS THE FLOW. THE REST OF THEM ARE RANDOMLY NUMBERED BUT CLEARLY EXPLAINED ABOVE.



User Account

User_ID	User
Email_ID	Email
Pass	Password

Premium

Subsciption_ID	Subscription ID
Startdate_ID	Start date
Enddate_ID	End date
Nopremium_ID	No premium user

Ads

Ads_ID	Ads ID
Ads_Analytics_ID	Ad Dates
	Target audience
	Impressions
	Clicks

Algorithm

Algorithm_ID	Algorithm Identity
Type_ID	Type of Algorithm
	Algorithm Analytics

Genre

Genre_ID	GenreID
Name	Name of the Genre

R & D

Research_ID	Implemented research ID
Developer_ID	ID of the researcher
	Description

Playlist

Playlist_ID	Identity of Playlist
Title_ID	Title of the Playlist
Description_ID	Genre,Artist Description

Artists

Artist_ID	Aritst ID
Name_ID	Name of the Aritst
	About Aritsts

Security

Sec_ID	Security ID
SecType_ID	Features
	Description

Trends

Trend_ID	TrendID
Trend_analytics_ID	Top songs
	Emerging Artists

Artist Music

ArtistPI_D	Producer Artist ID
Song_ID	Song made by the artist

Share

Share_ID	Shared ID
Social_Media_ID	ID that describes which social media it is shared to
SongLink_ID	Link of the music shared

Gen_AI Music

GenAI_ID	GenAI Identity of the song
SoundAi_ID	Music Sound produced by AI

DAN Composition

DanMusic_ID	Dan Produced Music ID
DanGenre_ID	Music sorted in certain Genre

Mix Music

Mix_ID	Mix Music ID
Music_name_ID	Mix Music Name
Artist_Name_ID	Artist Name
Mix_Description_ID	Date information
	Time span of the music

Feedback

Fed_ID	Feedback ID
FedDesc_ID	Feedback Description
	Socialmedia descprition

Key Pains Areas:

- Trying to keep scalability in mind and designing the ER Diagram to avoid issues once there is a large volume of data in the system.
- Normalization in the design to improve data consistency.
- Assigning the right relationship to the entities either it's one to many, many to many, mandatory to one, mandatary to many, optional to one or , optional to many.
- Transitive dependencies are reduced by the design. For instance, a distinct "Genre" entity is created for the "Genre" attribute.
- Selection of right attributes in the entities.
- Optimizing the design after multiple iterations.