Project Specification Report

Ian Waldschmidt [isw5@case.edu](mailto:isw5@case.edu) EECS 341 - Gurkan Bebek

Justin Lee [jpl88@case.edu](mailto:jpl88@case.edu) Introduction to Database Systems

Jacob Alspaw [jaa134@case.edu](mailto:jaa134@case.edu)

**1. Describe the problem concisely. Why is a database a good idea for this task?**

This database system will allow for the structured organization of media, specifically, pictures, videos, and music. After the completion of this course, our group aims to interface this project with a Raspberry Pi 3 Model B computer as means to develop a novel subscription based media sharing service and device, deemed *Project NightOwl*. Collections of public and private media will be stored externally on a server (on our local machine for the purposes of this project), so users of the media center will only have permission to access their media, ensuring data integrity. Users will interact with an application on the RPi that will enable media to be streamed to a monitor or television set. The application will allow users to search certain media by its attributes; e.g. production dates, actors, genres, titles, etc. The application will return a list of items that meet the given criteria. Additionally, users will be able to recommend open-access media and share their own personal media.

Users of the media center application will enjoy additional search features that would not be implemented easily otherwise. The database system will ensure a structured data management design and, most importantly, allow the user to efficiently search through files. Implementing a database system is crucial to this problem because not doing so will make the system unmanageable over time as new media is added to the set and will not allow searching features.

**2. Describe the intended users of your database system.**

Intended users for our product will be those with some working knowledge of the Linux operating system (though for the scope of this project this isn’t necessary), and also consumers looking for a combination of a computer and media streaming device. The target age range for this product will be 15 - 50 years old due to the product’s demand for technical skills. Besides the direct buyers, anyone who enjoys viewing pictures, watching videos, or listening to music can benefit from this product.

**3. Identify and describe entities about which you will need to keep information.**

*(Each entity will be divided into the appropriate number of tables as described below)*

**MEDIA:**

There are 3 different kinds of media we are concerned with: Pictures, Videos, and Music. Each picture will just have a description field, and each song will have a duration and an artist. Each video can either be a film or a personal video, but they both have a duration. Personal videos will only have a description, but films will have more information, including at least one actor, a director, and the rating (G, PG, R, etc.). In addition to these unique fields, each piece of media will have a creator (whoever uploads the material), a name (for example, the movie title or song name), and a number of ratings with comments from users on a scale from 1 to 10.

**USERS:**

Users table will consist of all the users with an account on the product. Each user will have their login information (username/password/email), demographics information (date of birth, gender, country), as well as a record of recently viewed media (including the time of access). Also, users will be able to access a record of their recently viewed media.

**4. Describe realistic situations where your database system will be used to accomplish tasks and operations.**

Not only will the devices serve as a personal media hub, but it can also be used to share content between users. This is similar to other media hubs like the Google Chromecast, but the ability to upload your own personal files separates it from similar devices, which lets it act not only as a media hub, but also as a cloud-based file storage system.

**5. Construct entity and relationship (ER) diagram of your database. Highlight any design decisions. Specifically, describe why you have the entities and relationships that you do.**

The updated ER diagram is included in our submitted zip file. Most of the design decisions come directly as a result of our entities described in question #3, but there are a few notable design decisions we made. First, we decided that each movie will only have 1 director and that each song will only have 1 artist. This is not always the case, but it is very often true, and for the few cases that have multiple directors or artists, they can simply be listed in a single string. Additionally, if our search tool is set to find a partial match between the user’s input and the database entries (which is more user-friendly), then anytime a user searches for a song/movie made by a particular artist/director, the search will also return any entries where the artist/director wasn’t the only person in charge of making the song/movie. And finally, we assumed that each piece of media only needs 1 ID, so we don’t have any extra primary keys for each type of media. Because of this, when any piece of media is added to the database, the unique mediaID it is given must be different from not just that everything of that type of media, but also from everything of all other types of media.

**6. Derive relational schemas from the entity and relationship (ER) diagram. Highlight any design decisions. Explain why you decided to make the relations you did and how each entity and relationship in the entity and relationship (ER) diagram is captured in the relational schema.**

Users(username: string, password: string, email: string, country: string, birthdate: date, gender: string)

Media(mediaID: integer, name: string, uploadedBy: string)

Feedback(feedbackID: integer, username: string, mediaID: integer, rating: int(1-10), comments: string)

Picture(description: string, pictureMediaID: integer)

Music(duration: int, artist: string, musicMediaID: integer)

Videos(duration: int, videoMediaID: integer)

HomeVideo(description: string, homeVideoMediaID: integer)

Movies(director: string, ageRating: string, movieMediaID: integer)

Acts(actsID: integer, name: string, mediaID: string)

Actors(name: string)

**7. List of Project Members and a brief description of their roles.**

In general, we all worked together on the project. More specifically, Jacob created the preliminary idea for the project and started the basic table structure, and Ian and Justin added ideas and features to the preliminary idea and constructed the ER diagram and schema. This document was made in Google Drive and worked on collaboratively.