

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
THE UNIVERSITY OF TEXAS AT ARLINGTON**

**SYSTEM REQUIREMENTS SPECIFICATION  
CSE 4316: SENIOR DESIGN I  
FALL 2018**



**THE UNDER ACHIEVERS  
SYNTHIFY**

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## REVISION HISTORY

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# 1 PRODUCT CONCEPT

Synthify is a music player that allows a user to bring all of their content from different platforms & services (YouTube, Spotify, SoundCloud, etc.) into one place

## 1.1 PURPOSE AND USE

Synthify will allow users to sign in with different providers to fetch their content from the respective platforms. This will allow them to have all their content in one place. Synthify required users to provide their login information for each service that they want to connect to. If a user does not have an account with one of the music services that can be connected with Synthify and he/she wants to start using that service, he/she has to meet the requirement of that service.

## 1.2 INTENDED AUDIENCE

Synthify is open to anyone who wants to use the service. There is no hard Terms of Service for using the platform. However, the associated services that users will be signed in with to get their content have their own Terms of Service. We align our product with those respective Terms of Service and should a consumer choose to our product, they must also follow those terms.

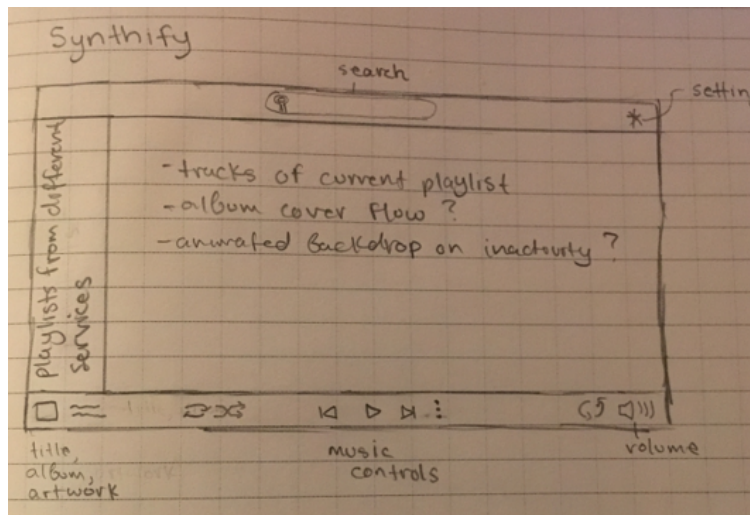


Figure 1: conceptual drawing

## **2 PRODUCT DESCRIPTION**

This section provides the reader with an overview of Synthify. The primary operational aspects of the product, from the perspective of end users, maintainers and administrators, are defined here. The key features and functions found in the product, as well as critical user interactions and user interfaces are described in detail.

### **2.1 FEATURES & FUNCTIONS**

Synthify.me will get playlists from a user from each platform, and bring them all together and have the playlists unified under one service. The service will auto-update after a certain amount of time to make sure it's consistent with any playlist changes that the user may have done on the respective platform. The "look and feel" of Synthify.me is similar to Spotify's dashboard. Users should expect to listen to music from each platform they have signed up for.

### **2.2 EXTERNAL INPUTS & OUTPUTS**

Synthify will utilize the various other streaming services' APIs to retrieve the user's playlists. Assuming these playlists are retrieved, the application will stream the music content using YouTube. The music will only be streaming when a user clicks the play button on a song or playlist. The external output will be music being played on the device the user is currently using.

### **2.3 PRODUCT INTERFACES**

The look of Synthify is similar to Spotify's dashboard. Each song and playlist will have a play button that the user is able to click to start the song or playlist.

### **3 CUSTOMER REQUIREMENTS**

Synthify.me will get playlists from a user from each platform, and bring them all together and have the playlists unified under one service. The service will auto-update after a certain amount of time to make sure it's consistent with any playlist changes that the user may have done on the respective platform. The "look and feel" of Synthify.me is similar to Spotify's dashboard. Users should expect to listen to music from each platform they have signed up for.

#### **3.1 SELECT A SONG FROM A PLAYLIST**

##### **3.1.1 DESCRIPTION**

The system shall allow a user to select a song from a playlist.

##### **3.1.2 SOURCE**

Mary Huerta

##### **3.1.3 CONSTRAINTS**

NA

##### **3.1.4 STANDARDS**

NA

##### **3.1.5 PRIORITY**

Critical

#### **3.2 USER SIGN IN**

##### **3.2.1 DESCRIPTION**

The user shall authenticate themselves with their credentials i.e. their email and password they signed up with.

##### **3.2.2 SOURCE**

Mary Huerta

##### **3.2.3 CONSTRAINTS**

Invalid emails and invalid passwords will be checked. If the user types in an email that does not exist do not let them sign in.

##### **3.2.4 STANDARDS**

NA

##### **3.2.5 PRIORITY**

Critical

#### **3.3 USER SIGN UP**

##### **3.3.1 DESCRIPTION**

User shall sign up with their email, a password, any music services they use and their name.

##### **3.3.2 SOURCE**

Mary Huerta

### **3.3.3 CONSTRAINTS**

Emails have to have an "@" character and if the email has already been used by another user the system will not let them register as a new user. User must have an email.

### **3.3.4 STANDARDS**

NA

### **3.3.5 PRIORITY**

Critical

## **3.4 UPDATE PLAYLISTS**

### **3.4.1 DESCRIPTION**

The system shall utilize AJAX to check if the play list has changed on the service and get updated play lists after a certain amount of time.

### **3.4.2 SOURCE**

Mary Huerta

### **3.4.3 CONSTRAINTS**

The system can not update playlists by calling of the APIs too frequently or it will be given a 429 status code. Thus there should be a set constraint on how much the system can call any of the APIs. User must be registered to at least one of the services to be shown any playlist.

### **3.4.4 STANDARDS**

NA

### **3.4.5 PRIORITY**

Critical

## **3.5 SHOW PLAYLISTS FROM DIFFERENT SERVICES**

### **3.5.1 DESCRIPTION**

The system shall display playlists from different music services like Youtube, Spotify, and SoundCloud

### **3.5.2 SOURCE**

Mary Huerta

### **3.5.3 CONSTRAINTS**

User must be registered to at least one of the services to be shown any playlist. Users must also have playlists on the services that can be updated and shown.

### **3.5.4 STANDARDS**

NA

### **3.5.5 PRIORITY**

High

## **3.6 SEARCH FOR SONGS**

### **3.6.1 DESCRIPTION**

The system shall allow users to search for songs in their playlists.

### **3.6.2 SOURCE**

Mary Huerta

### **3.6.3 CONSTRAINTS**

User must be registered to at least one of the services to be shown any playlist. If there is no song that matches the search terms then the user will be shown a message that they're term didn't match a song.

### **3.6.4 STANDARDS**

NA

### **3.6.5 PRIORITY**

High

## **3.7 CHANGE THE VOLUME**

### **3.7.1 DESCRIPTION**

The system shall allow users to change the volume of the song they are listening to

### **3.7.2 SOURCE**

Mary Huerta

### **3.7.3 CONSTRAINTS**

If the system is playing a song it must change the volume dynamically. If the system isn't playing a song the next song played will have the volume the user requested. Speakers/Headphones are required to hear differences in volume.

### **3.7.4 STANDARDS**

NA

### **3.7.5 PRIORITY**

Critical

## **3.8 THE SYSTEM SHALL PLAY A SONG**

### **3.8.1 DESCRIPTION**

The song shall be streamed from a URL

### **3.8.2 SOURCE**

Kolten Sturgill

### **3.8.3 CONSTRAINTS**

NA

### **3.8.4 STANDARDS**

NA

### **3.8.5 PRIORITY**

Critical

## **3.9 REPLAY SONGS**

### **3.9.1 DESCRIPTION**

The system shall allow users to replay a song.

### **3.9.2 SOURCE**

Mary Huerta

### **3.9.3 CONSTRAINTS**

If the system isn't playing a song the next song played will be repeated.

### **3.9.4 STANDARDS**

NA

### **3.9.5 PRIORITY**

low

## **3.10 ADD MUSIC SERVICE**

### **3.10.1 DESCRIPTION**

The system shall allow users to add music services (YouTube Music, Spotify, Soundcloud) to their account.

### **3.10.2 SOURCE**

Mary Huerta

### **3.10.3 CONSTRAINTS**

Users must have an account with the music service before adding a service to their Synthify.me account.

### **3.10.4 STANDARDS**

NA

### **3.10.5 PRIORITY**

Critical

## **3.11 DISPLAY CURRENT SONG TITLE**

### **3.11.1 DESCRIPTION**

The system shall display the current song title the user is listening to.

### **3.11.2 SOURCE**

Mary Huerta

### **3.11.3 CONSTRAINTS**

If the system isn't playing a song no song title will be displayed.

### **3.11.4 STANDARDS**

NA

### **3.11.5 PRIORITY**

High

## **3.12 DISPLAY CURRENT SONG TIME**

### **3.12.1 DESCRIPTION**

The system shall display the time within current song the user is listening to.

### **3.12.2 SOURCE**

Mary Huerta

### **3.12.3 CONSTRAINTS**

If the system isn't playing a song no song Time will be displayed. If the system is paused on the song then that song's time will be displayed.

### **3.12.4 STANDARDS**

NA

### **3.12.5 PRIORITY**

High

## **3.13 STORING USER PREFERENCES**

### **3.13.1 DESCRIPTION**

The system shall store users local preferences (volume setting, color of page).

### **3.13.2 SOURCE**

Kolten Sturgill

### **3.13.3 CONSTRAINTS**

NA

### **3.13.4 STANDARDS**

NA

### **3.13.5 PRIORITY**

Low

## **3.14 PLAYING A NEXT SONG**

### **3.14.1 DESCRIPTION**

The system shall consecutively play another song after the previous song has ended.

### **3.14.2 SOURCE**

Mary Huerta

### **3.14.3 CONSTRAINTS**

NA

### **3.14.4 STANDARDS**

NA

### **3.14.5 PRIORITY**

High

## **3.15 STORING USER SEARCHES**

### **3.15.1 DESCRIPTION**

The system shall store each query the user make

### **3.15.2 SOURCE**

Kolten Sturgill

### **3.15.3 CONSTRAINTS**

NA

### **3.15.4 STANDARDS**

NA

### **3.15.5 PRIORITY**

High

## **3.16 STORING API RESULTS**

### **3.16.1 DESCRIPTION**

The system shall store each result in correspondence with the users search results

### **3.16.2 SOURCE**

Kolten Sturgill

### **3.16.3 CONSTRAINTS**

NA

### **3.16.4 STANDARDS**

NA

### **3.16.5 PRIORITY**

High

## **3.17 SEARCHING FOR PREVIOUS USER SEARCHES**

### **3.17.1 DESCRIPTION**

The system shall check previously made user searches for similar results in order to preserve critical API access.

### **3.17.2 SOURCE**

Kolten Sturgill

### **3.17.3 CONSTRAINTS**

NA

### **3.17.4 STANDARDS**

NA

### **3.17.5 PRIORITY**

Low

## **3.18 NEXT SONG SHUFFLED**

### **3.18.1 DESCRIPTION**

The system shall play random song in the playlist if the the previous song has ended if the user has selected shuffle mode.



### **3.18.2 SOURCE**

Mary Huerta

### **3.18.3 CONSTRAINTS**

The next song that will be played will be based upon whether the user has selected shuffle in-order or shuffle.

### **3.18.4 STANDARDS**

NA

### **3.18.5 PRIORITY**

High

## **3.19 NEXT SONG NON-SHUFFLED**

### **3.19.1 DESCRIPTION**

The system shall play a song in order from the current playlist if the previous song has ended if the user has selected in-order mode

### **3.19.2 SOURCE**

Mary Huerta

### **3.19.3 CONSTRAINTS**

The next song that will be played will be based upon whether the user has selected shuffle in order or shuffle.

### **3.19.4 STANDARDS**

NA

### **3.19.5 PRIORITY**

High

## **3.20 USER SIGN OUT**

### **3.20.1 DESCRIPTION**

User shall be able to sign out of their account.

### **3.20.2 SOURCE**

Mitchel Smith

### **3.20.3 CONSTRAINTS**

NA

### **3.20.4 STANDARDS**

NA

### **3.20.5 PRIORITY**

Critical

## **3.21 PREVIOUS SONG**

### **3.21.1 DESCRIPTION**

The system shall play the previously played song

### **3.21.2 SOURCE**

Mitchel Smith

### **3.21.3 CONSTRAINTS**

NA

### **3.21.4 STANDARDS**

NA

### **3.21.5 PRIORITY**

High

## **3.22 STORE PREVIOUSLY PLAYED SONGS**

### **3.22.1 DESCRIPTION**

The system shall store the previously played songs of the user's current session.

### **3.22.2 SOURCE**

Mitchel Smith

### **3.22.3 CONSTRAINTS**

NA

### **3.22.4 STANDARDS**

NA

### **3.22.5 PRIORITY**

High

## **3.23 REPEAT PLAYLIST**

### **3.23.1 DESCRIPTION**

The system shall repeat the playlist if the repeat button is selected

### **3.23.2 SOURCE**

Mitchel Smith

### **3.23.3 CONSTRAINTS**

NA

### **3.23.4 STANDARDS**

NA

### **3.23.5 PRIORITY**

Medium

## **3.24 CHANGING PAGE THEME**

### **3.24.1 DESCRIPTION**

The system shall have a light mode (white background with black text) and dark mode (Black background with white text). It shall be available to be switched from light mode to dark mode in the user's settings.

### **3.24.2 SOURCE**

Kolten Sturgill

### **3.24.3 CONSTRAINTS**

NA

### **3.24.4 STANDARDS**

NA

### **3.24.5 PRIORITY**

Future

## **3.25 REPEAT SONG**

### **3.25.1 DESCRIPTION**

The system shall repeat the song if the repeat song button is selected

### **3.25.2 SOURCE**

Mitchel Smith

### **3.25.3 CONSTRAINTS**

NA

### **3.25.4 STANDARDS**

NA

### **3.25.5 PRIORITY**

Medium

## **3.26 DISPLAY ALBUM ARTWORK**

### **3.26.1 DESCRIPTION**

The system shall display the album artwork of the currently playing song.

### **3.26.2 SOURCE**

Mitchel Smith

### **3.26.3 CONSTRAINTS**

NA

### **3.26.4 STANDARDS**

NA

### **3.26.5 PRIORITY**

Low

## **3.27 STOP SONG**

### **3.27.1 DESCRIPTION**

The user shall be able to stop the currently playing song

### **3.27.2 SOURCE**

Mitchel Smith

### **3.27.3 CONSTRAINTS**

NA

### **3.27.4 STANDARDS**

NA

### **3.27.5 PRIORITY**

Critical

## **3.28 PLAY SONG**

### **3.28.1 DESCRIPTION**

The user shall be able to start the current song if it is stopped

### **3.28.2 SOURCE**

Mitchel Smith

### **3.28.3 CONSTRAINTS**

NA

### **3.28.4 STANDARDS**

NA

### **3.28.5 PRIORITY**

Critical

## **4 PACKAGING REQUIREMENTS**

Synthify will be delivered and view-able as a web application, but the source code will be available in a repository for the stakeholder to view.

### **4.1 HOSTING**

#### **4.1.1 DESCRIPTION**

The system shall be a website hosted on GitHub Pages. The back-end services that handles API requests will be hosted on Heroku.

#### **4.1.2 SOURCE**

Mary Huerta

#### **4.1.3 CONSTRAINTS**

NA

#### **4.1.4 STANDARDS**

NA

#### **4.1.5 PRIORITY**

Critical

### **4.2 WEBSITE**

#### **4.2.1 DESCRIPTION**

The system shall be a web application accessible via an internet browser.

#### **4.2.2 SOURCE**

Mary Huerta

#### **4.2.3 CONSTRAINTS**

NA

#### **4.2.4 STANDARDS**

NA

#### **4.2.5 PRIORITY**

Critical

## **5 PERFORMANCE REQUIREMENTS**

Synthify will primarily be a web-based application. The thoughts behind performance are more so worrying about response time from the API's we will be calling and the load times for the site when a user is interacting with it.

### **5.1 RESPONSIVENESS**

#### **5.1.1 DESCRIPTION**

The system shall load itself in less than 60 seconds after the user had logged in

#### **5.1.2 SOURCE**

Mary Huerta

#### **5.1.3 CONSTRAINTS**

The user should have an internet speed of 40 Mbps or more to load everything.

#### **5.1.4 STANDARDS**

NA

#### **5.1.5 PRIORITY**

Medium

## **6 SAFETY REQUIREMENTS**

Synthify is purely software and thus requires no physical safety requirements.

## **7 MAINTENANCE & SUPPORT REQUIREMENTS**

To support Synthify.me after it's delivery there will be on-boring features to help new users learn about Synthify.me's features. There will be also be a FAQ page for troubleshooting with new and old users. There will also be documentation of source code available on Github.

### **7.1 ON-BOARDING PAGE**

#### **7.1.1 DESCRIPTION**

The system shall have an on-boarding page on the website to help new users learn how to add music services and play music.

#### **7.1.2 SOURCE**

Mary Huerta

#### **7.1.3 CONSTRAINTS**

NA

#### **7.1.4 STANDARDS**

NA

#### **7.1.5 PRIORITY**

Critical

### **7.2 FAQ PAGE**

#### **7.2.1 DESCRIPTION**

The system shall have a FAQ page on the website to help on-board new users.

#### **7.2.2 SOURCE**

Mary Huerta

#### **7.2.3 CONSTRAINTS**

NA

#### **7.2.4 STANDARDS**

NA

#### **7.2.5 PRIORITY**

Critical

### **7.3 DOCUMENTATION OF SOURCE CODE**

#### **7.3.1 DESCRIPTION**

The system shall be documented and it's code available on Github.

#### **7.3.2 SOURCE**

Mary Huerta

#### **7.3.3 CONSTRAINTS**

NA



#### **7.3.4 STANDARDS**

NA

#### **7.3.5 PRIORITY**

Critical

## **8 OTHER REQUIREMENTS**

Due to our time constraints we will not plan for having extensibility and modularity therefore it is not required. There will be no setup required by the user besides having an account with our service and a internet browser above and certain version.

### **8.1 INTERNET BROWSERS**

#### **8.1.1 DESCRIPTION**

The system shall work on Chrome version 70.0.3538.77 and above, Safari version 12.0.1 and above, and Firefox version 63.0.1 and above.

#### **8.1.2 SOURCE**

Mary Huerta

#### **8.1.3 CONSTRAINTS**

NA

#### **8.1.4 STANDARDS**

NA

#### **8.1.5 PRIORITY**

Critical

## **9 FUTURE ITEMS**

Synthify.me will contain some requirements that can be done in the future one of which is it's color scheme. A time constraint on the project may limit the ability to have two color schemes.

### **9.1 CHANGING PAGE THEME**

#### **9.1.1 DESCRIPTION**

The system shall have a light mode (white background with black text) and dark mode (Black background with white text). It shall be available to be switched from light mode to dark mode in the user's settings.

#### **9.1.2 SOURCE**

Kolten Sturgill

#### **9.1.3 CONSTRAINTS**

NA

#### **9.1.4 STANDARDS**

NA

#### **9.1.5 PRIORITY**

Future

## REFERENCES