



LISTR

# Project Proposal

Arranged by:

**Grace Chen**

**Patrick Cole**

**Nicholas Drake**

**Olushola Durojaiye**

**Lena Lu**

Office:

633 Clark St.

Evanston, IL 60208

+1 847 491-3741

project@listr.com

www.listr.com



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# The Team



Grace Chen currently is working as a data science developer within a large insurance firm by creating various pricing optimization tools across multiple lines of business for internal stakeholders. She has led teams of software developers as well as spearheaded high priority projects to produce explicit results and immediate benefits to the organization. Prior to her current position, she has experience with various roles involving production support, model building, and data engineering.

Patrick Cole has over twenty years of experience within the United States Department of Defense in a variety of roles that have included; disarming bombs, presidential protection, leading a rapid prototyping laboratory, and serving as a data scientist and data engineer. He has led high-stakes projects that garner national level exposure where failure is not an option. He is comfortable translating technical subjects into digestible information and briefing findings to decision makers at all levels. He finds creative and innovative solutions by partnering with different skill sets to enhance project outcomes.



Nicholas Drake is a Director of Data Solution Strategy responsible for developing and executing ESG data-driven strategies to solve Responsible Investing business problems and drive organizational growth. He has expertise in various areas of data analytics, including data warehousing, data mining, data visualization, and predictive modeling. Nicholas works closely with data scientists, engineers, and other stakeholders to identify and prioritize data-driven solutions that align with business goals.

Olushola Durojaiye is an Analytics Developer with several years of experience in system analysis, data modeling, database design, SQL programming, data analysis, and metrics reporting. He possesses extensive expertise in ETL processes and business reporting, utilizing the Microsoft Business Intelligence Stack and Tableau suite of products. Additionally, he demonstrates strong leadership, organizational, oral/written communication, interpersonal, analytical, and problem-solving skills. He excels in both independent and collaborative work environments.



Lena Lu is a Senior Insight Analyst and has five years of experience working with data initiatives in retail and supply chain. She currently works with a large U.S. grocery retailer client on various data driven projects. She has led end-to-end data projects and has worked alongside data engineers, data scientists, analysts, and key business stakeholders on those projects. She is able to work cross functionally with different teams and audiences while being an individual contributor.

# Vision and Mission

Streaming has become the primary listening format for music in the last decade. It has grown at an average rate of 43.9% since 2014 with an annual revenue of \$13.7B in the United States alone in 2022<sup>1</sup>. With any highly profitable business, there are bound to be many competitors vying for their own share. Spotify currently dominates the global music streaming market share at 32% in 2021, but that is on the decline as they were at 34% in 2019<sup>2</sup>. The market is oversaturated-- Amazon Music and YouTube Music increased their subscriber count by 25% and 50% respectively in 2021.

You may ask, "why would we join an oversaturated market?"

The answer is simple. Our AI generated playlists brings a personalized touch that sets us apart from the rest of the market. Music is very personal. No two people will have exactly the same tastes, so their playlists should be unique to them.

Aside from personalized playlists, users can ask our chatbot to make them playlists based on prompts such as "songs about Tennessee" or "Taylor Swift's saddest songs"

Consumers only need one subscription; we'll make sure Listr is the one they choose.



[1] David Curry, "Music Streaming App Revenue and Usage Statistics (2023)," Business of Apps, May 2, 2023, <https://www.businessofapps.com/data/music-streaming-market/>.

[2] "Music Streaming Market Share and Revenue Statistics: Details on the Biggest Music Streaming Services," SiriusXM Music for Business, January 27, 2023, <https://sxmbusiness.com/music-streaming-market-share-and-revenue-statistics>.

# Objectives

01	Determine the best performing model to build a playlist from a subject prompt.
02	Determine the best performing model to build a playlist from a mood/emotion/feeling prompt
03	Determine the best performing model to build a playlist from a lyrical prompt.
04	Develop an interactive dashboard that allows testers, decision-makers, and customers to create custom playlists, test model performance, and showcase functionality.
05	Prototype a mobile application that will allow testers, decision-makers, and customers to create custom playlists, test model performance, showcase functionality, and drive user interface adaptations prior to launch.
06	Seek approval from the company CEO for a live beta implementation during quarter 4 of 2023.
07	Obtain approval from the company CEO and board for a full-scale application deployment by the end of quarter 1 of 2024.

# Approach

For this project, our team will first define the user requirements and expectations for the application, ensuring a clear understanding of the target audience and their preferences. Next, we will collect and preprocess relevant data, such as music metadata, track audio features and track similarity. Using multiple models, we will select the most appropriate model for playlist recommendation and train it using the collected data. Lastly, we will develop a user interface that enables users to input prompts related to subjects, moods, emotions, and lyrics, and receive personalized playlist recommendations in response.

Our models and application will be thoroughly tested and evaluated, incorporating feedback from testers and users to refine its functionality. We will seek necessary approvals for deployment and strategically launch the application, ensuring user satisfaction and continually gathering feedback for further improvements. Throughout the project, we will maintain a strong focus on delivering a personalized and user-friendly music streaming experience.



# Data Sources

## Spotify API<sup>3</sup>

As we will be focusing on personalization within Spotify, we will be utilizing Spotify's API to access music data, user playlists, and recommendations. Spotify's API allows us to search for tracks, albums, artists, and playlists and pull back unique audio features such as danceability, energy, loudness, and valence. The API also allows Spotify users to interact directly with their account, in which we can programmatically create playlists based on our model's suggestion

## Million Song Dataset<sup>4</sup>

Million Song Dataset is a large collection of audio features and metadata for a million contemporary popular music tracks. It was created for research purposes and provides a rich set of data that can be used for various music-related analyses and machine learning tasks. The Million Song Dataset data includes track metadata, range of audio features computed from the audio signal of each track, social tags associated with each track, and information on track similarity and nearest neighbors based on audio features.

## Lyrics Database<sup>5</sup>

With access to Musixmatch, the largest lyrics database globally, consisting of over 14 million lyrics, we can leverage their API to retrieve lyrics data. Our script will efficiently parse the obtained data, allowing us to extract the necessary lyrics and seamlessly integrate them into our playlist generation logic. This integration will enhance the thematic and lyrical aspects of the playlists we curate, providing users with a more enriched music streaming experience.

[3] "Spotify API," Web API | Spotify for Developers, accessed July 8, 2023, <https://developer.spotify.com/documentation/web-api>.

[4] Million Song Dataset, accessed July 8, 2023, <http://millionsongdataset.com/>.

[5] "Build with Lyrics." Musixmatch Developer. Accessed July 8, 2023. <https://developer.musixmatch.com/>.

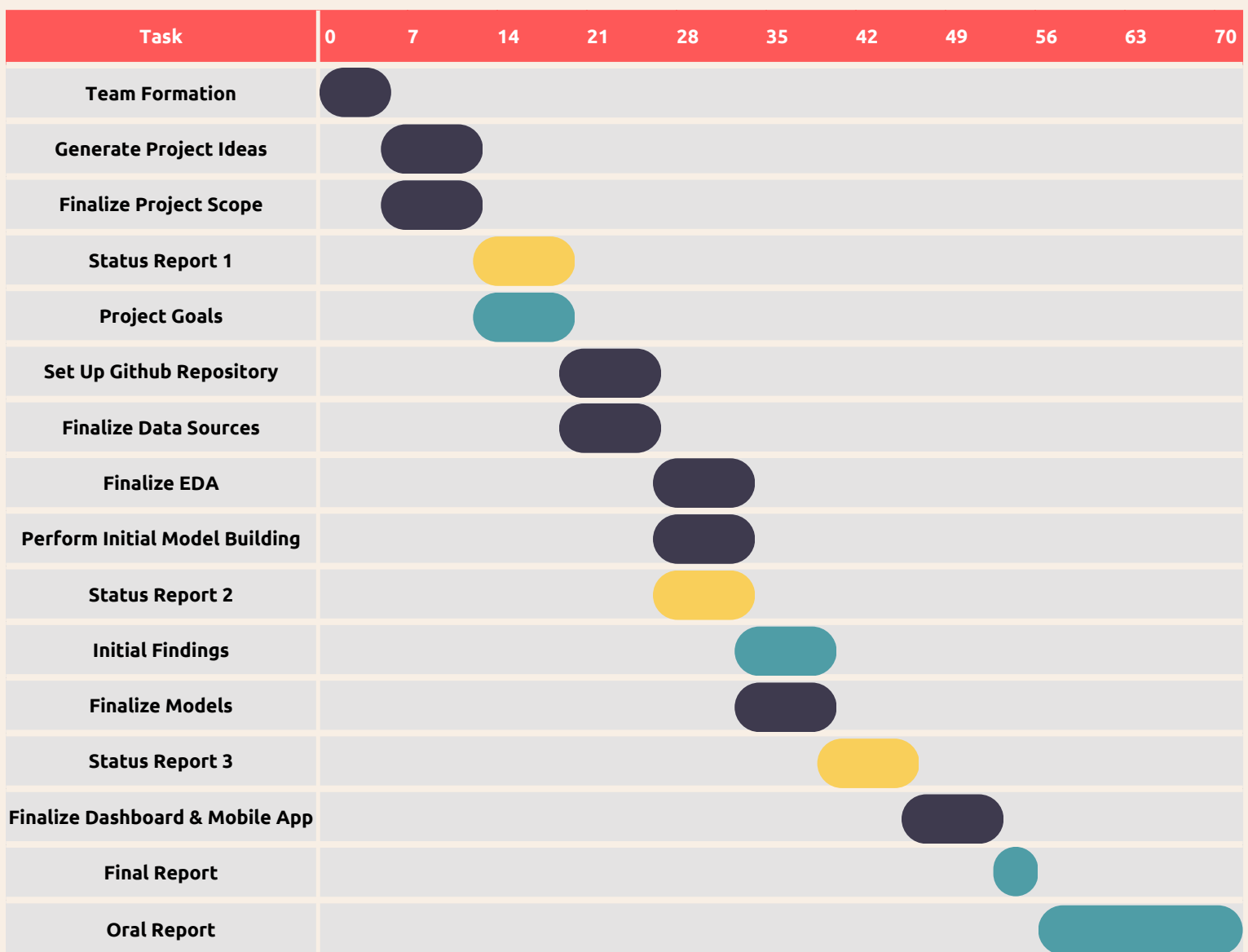
# Milestones & Timeline

The team has created a project plan as depicted in the figures below. Throughout the duration of the project, bi-weekly status reports are delivered to stakeholders to provide updates and accomplishments as well as address concerns and risks with the timeline. These also include an overall project status as well as the plan for the upcoming weeks. In the figures below, the major deliverables or milestones are highlighted in blue while the status reports are highlighted in yellow.

Task Name	Start Date	End Date	Day	Duration
<b>Team Formation</b>	6/20/23	6/25/23	0	5
<b>Generate Project Ideas</b>	6/25/23	7/2/23	5	7
<b>Finalize Project Scope</b>	6/25/23	7/2/23	5	7
<b>Status Report 1</b>	7/2/23	7/9/23	12	7
<b>Project Goals Deliverable</b>	7/2/23	7/9/23	12	7
<b>Set up Github Repository</b>	7/9/23	7/16/23	19	7
<b>Finalize Data Sources</b>	7/9/23	7/16/23	19	7
<b>Finalize Eda</b>	7/16/23	7/23/23	26	7
<b>Initial Model Building</b>	7/16/23	7/23/23	26	7
<b>Status Report 2</b>	7/16/23	7/23/23	26	7
<b>Initial Findings Deliverable</b>	7/23/23	7/30/23	33	7
<b>Executive Summary Deliverable</b>	7/23/23	7/30/23	33	7
<b>Final Models</b>	7/30/23	8/6/23	40	7
<b>Status Report 3</b>	7/30/23	8/6/23	40	7
<b>Finalize Dashboard &amp; Mobile Apps</b>	8/6/23	8/13/23	47	7



To accomplish this plan, the team decided to use multiple external tools for project management and collaboration purposes including ClickUp, Slack, and Google Drive . This set up allows the team to create meeting agendas, generate new tasks as appropriate, and collaborate effectively on deliverables. The team plans to meet formally once a week using Google Hangouts to drive the project forward such as provide updates on deliverables, address challenges, and make collective decisions. Additional meetings will be scheduled as necessary as deadlines approach. Outside of regular meetings, the team will use the designated Slack channel to communicate regularly. Git and Github will be used to manage the collaboration for the code base and share code efficiently.



# Closing Remarks

The music streaming industry has experienced significant growth over the past decade, with streaming becoming the primary format for music consumption. However, with intense competition among streaming services, companies must find innovative ways to differentiate themselves and attract and retain customers. Our project aims to address this challenge by focusing on AI personalization in music streaming.

By developing an application that leverages AI technology, we will provide subscribers with a unique and personalized music streaming experience. Through prompts and user input related to subjects, moods, emotions, and lyrics, our application will generate specialized playlists tailored to the individual preferences of each user. This AI-driven personalization will enhance the user experience and offer a new and convenient way to discover and enjoy music.

To achieve this, our team will begin by defining user requirements and expectations, ensuring a clear understanding of the target audience and their preferences. We will collect and preprocess relevant data, including music metadata, track audio features, and track similarity, which will serve as the foundation for our recommendation models. Through rigorous testing and evaluation, incorporating feedback from testers and users, we will refine the functionality of our application to ensure optimal performance and user satisfaction.

We will utilize the Spotify API and the Million Song Dataset to access audio features and metadata for music tracks.

To enhance user interaction, we will incorporate a chatbot framework using tools like chatterBot, NLTK Rasa, or OpenAI. This chatbot will understand user intents and prompts, allowing for natural language communication and generating playlist recommendations based on user inputs.

Throughout the project, we will maintain a strong focus on delivering a personalized and user-friendly music streaming experience. By strategically launching the application and continuously gathering user feedback, we will iterate and improve upon our models and interface to ensure that our offering remains innovative and compelling in a highly competitive market.

Overall, our project aims to revolutionize the music streaming experience by leveraging AI personalization and providing users with tailored playlists based on their unique preferences and inputs. By differentiating ourselves from other streaming services, we strive to attract and retain a loyal user base and establish our application as a go-to platform for music discovery and enjoyment.

# References

"Build with Lyrics." Musixmatch Developer. Accessed July 8, 2023.  
<https://developer.musixmatch.com/>.

Curry, David. "Music Streaming App Revenue and Usage Statistics (2023)." Business of Apps, May 2, 2023. <https://www.businessofapps.com/data/music-streaming-market/>.

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<https://sxmbusiness.com/music-streaming-market-share-and-revenue-statistics/#:~:text=Spotify's%20subscribers%20increased%20by%20,increased%20by%20more%20than%2050%25>.

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