

RIDHIM

FINAL PROJECT REPORT

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BONAFIDE CERTIFICATE

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

The project 'Ridhim' (Music Streaming Application) is a application that can be used for services related to music. It provides an easy and convenient way to access music anytime, anywhere. Users can stream or download millions of songs to their device with just a few clicks, making it easy for them to enjoy their favorite music anytime, anywhere. These apps use advanced algorithms to customize the user experience and offer recommendations based on the user's listening and preferences. This helps users discover new music they might not find otherwise and can create a more engaging and enjoyable listening experience. This app provides access to a large library of songs spanning many genres, artists, and eras.

CHAPTER 1

INTRODUCTION

1.1. Client Identification/Need Identification:

In developing our music player project, we have identified several potential client groups with unique needs. Our target audiences include music enthusiasts who value high-quality audio and personalized playlists, fitness and sports enthusiasts who require features like workout playlists and durable hardware, travelers and commuters who seek offline playback and long battery life, audiophiles who appreciate premium audio components and lossless format support, students and professionals who need productivity-oriented features, and elderly individuals who prefer user-friendly interfaces. To meet their needs, our music player will prioritize user-friendly interfaces, excellent audio quality, personalization and recommendations, seamless integration with streaming services, portability, connectivity options, sufficient storage capacity, durability, and additional features like playlist synchronization and lyrics display. By understanding our clients and their specific requirements, we aim to deliver a music player that enhances their listening experience and meets their diverse needs

1.2. Identification of Problem

The existing music player Android apps face several problems that hinder users from enjoying a seamless and personalized music experience. One of the common issues is the complex user interface, which often overwhelms users with cluttered menus and confusing navigation. Users find it challenging to locate specific features or customize their music settings, leading to frustration and a poor user experience.

Another problem is the limited audio format support of many music player apps. Users encounter difficulties playing certain file types or high-quality lossless formats, restricting their ability to enjoy their music library to the fullest. This limitation can be particularly frustrating for audiophiles or users with diverse music collections.

Personalization options are often lacking in many music player apps. Users desire the ability to create custom playlists, organize their music library efficiently, and receive personalized recommendations based on their music preferences. Without these features, users struggle to tailor their music experience to their liking.

Connectivity issues also plague some music player apps. Users may face challenges in connecting their app to other devices or streaming services. This includes difficulties in pairing Bluetooth devices, syncing music libraries across multiple devices, or experiencing interruptions in streaming playback. Such issues disrupt the seamless flow of music and undermine the overall user experience.

Inconsistent audio quality is another significant problem. Users expect their music player app to deliver high-quality audio playback without distortion or volume imbalances. However, some apps fail to provide reliable and consistent audio performance, diminishing the enjoyment of the music.

Performance problems such as slow loading times, frequent crashes, or excessive resource consumption are also common complaints among music player app users. These issues not only disrupt the user experience but can also impact the overall performance of the device.

Furthermore, many music player apps lack robust offline playback options. Users who frequently travel or have limited internet access may struggle to enjoy their music without a reliable offline playback feature. They desire the ability to download and store their favorite tracks locally for uninterrupted listening.

Lastly, inadequate music discovery features hinder users from exploring new music or discovering curated playlists. Users want an app that helps them discover new artists, genres, or songs that align with their musical preferences, enhancing their overall music experience.

DRAWBACKS OF EXISTING SYSTEM:

1. **Complex User Interface:** Many music player apps have complex and cluttered interfaces, making it difficult for users to navigate and find the features they need. This can lead to frustration and a poor user experience.
2. **Limited Audio Format Support:** Some music player apps may have limitations in supporting various audio formats. Users may encounter issues when trying to play specific file types or high-quality lossless formats.
3. **Lack of Personalization:** Users often desire a personalized music experience, including the ability to create custom playlists, organize their music library, and receive recommendations based on their preferences. Many music player apps lack robust personalization features.

4. **Connectivity Issues:** Users may face challenges in connecting their music player app with other devices or streaming services. This can include difficulties in pairing Bluetooth devices, syncing music libraries across multiple devices, or experiencing interruptions in streaming playback.
5. **Inconsistent or Poor Audio Quality:** Users expect a music player app to deliver high-quality audio playback. However, some apps may have issues with audio distortion, uneven volume levels, or lack of support for advanced audio settings such as equalizers.
6. **Performance and Stability Problems:** Music player apps that are slow, crash frequently, or consume excessive device resources can significantly impact the user experience. Users want an app that is reliable, responsive, and performs well even with large music libraries.
7. **Limited Offline Playback Options:** Users who frequently travel or have limited internet access may struggle with music player apps that have limited offline playback capabilities. They may desire the ability to download and store music locally for offline listening.
8. **Inadequate Music Discovery Features:** Users often appreciate discovering new music or exploring curated playlists.

1.3. Gantt Chart

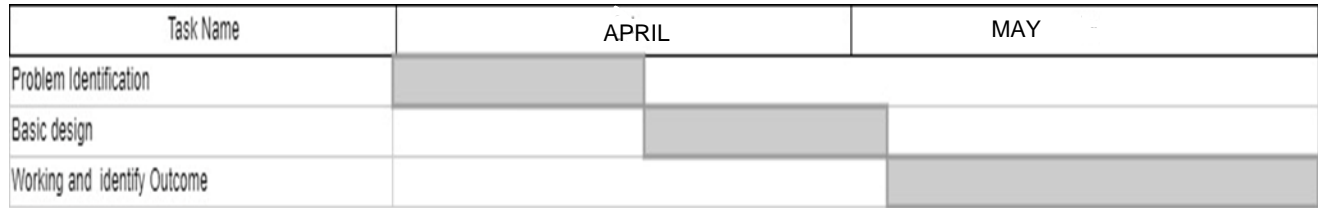


Figure 1.1: Gantt Chart

1.4. Organization of the Report

Based on the outline design of the system requirements in terms of inputs, output, Procedures, the technical issues raised during technical feasibility include:

- Does the necessary technology exist to do what is proposed?
- Does the proposed equipment have the technical capacity to hold the data required to use in the new system?
- Adequate responses provided by the proposed system?
- Is the system flexible enough to facilitate expansion?
- Is there any technical guarantee of accuracy, reliability, ease of access and data security?
- The system developer's task is to view needed capabilities in light of currently available technology. Our site works hand
- In the current system which is the semi computerized system the information may be lost in the process of sending from one place to another. This is mainly due to human interaction in the process of the transferring information from one place to another. Whether the new system affects the current users in the system?

The new proposed system will affect the users in the following areas

- Accuracy
- Efficiency
- Productivity

CHAPTER 2.

LITERATURE REVIEW

Music plays an important role in every person life. Over the time , it has been proved that music has immense effect in every aspect of life whether it is personal growth or social growth . Music has been shown to have many cognitive benefits, from improving memory and thinking to encouraging creativity and problem solving. Playing music or singing can also help develop fine motor skills and coordination.It can be a great way to showcase and celebrate a culture and heritage and can help bring people from different backgrounds together. Music is a universal language that brings people together and creates a sense of community. Music can create unity and build strong relationships. Music therapy has been used to help people cope with a variety of physical and mental problems, from chronic pain to depression and anxiety. Listening to music can also reduce stress and stimulate emotions.

Online music streaming apps have become increasingly popular in recent years, with the rise of smartphones and the increasing availability of high-speed internet. These apps helps in different ways.

It provides an easy and convenient way to access music anytime, anywhere. Users can stream or download millions of songs to their device with just a few clicks, making it easy for them to enjoy their favorite music anytime, anywhere. These apps use advanced algorithms to customize the user experience and offer recommendations based on the user's listening and preferences. This helps users discover new music they might not find otherwise and can create a more engaging and enjoyable listening experience.

These apps provides access to a large library of songs spanning many genres, artists, and eras. This means users can easily search for new movies and artists or rediscover old favorites all in one place. Many music apps offer integrations that allow users to share their favorite songs and playlists with friends and followers on social media. This will help create a sense of community and link music and can introduce users to new songs their friends are listening to. Music app provides a great way to access and enjoy music. While many apps offer free versions with limited features, premium versions often offer additional benefits such as ad-free listening, offline playback, and better sound. This literature review will provide an overview of the current state of research on online music streaming apps and their impact on the music industry.

BACKGROUND STUDY

Music streaming applications have revolutionized the way people consume music in the digital age. These apps provide users with access to a vast library of songs and artists, personalized recommendations, and the convenience of on-demand listening without the need for physical media. They have become increasingly popular due to the rise of smartphones and the increasing availability of high-speed internet. However, these apps have also raised concerns about the impact on the music industry, particularly for artists and record labels. Technical challenges such as audio quality and compatibility with different devices and platforms also need to be addressed to ensure a high-quality user experience.

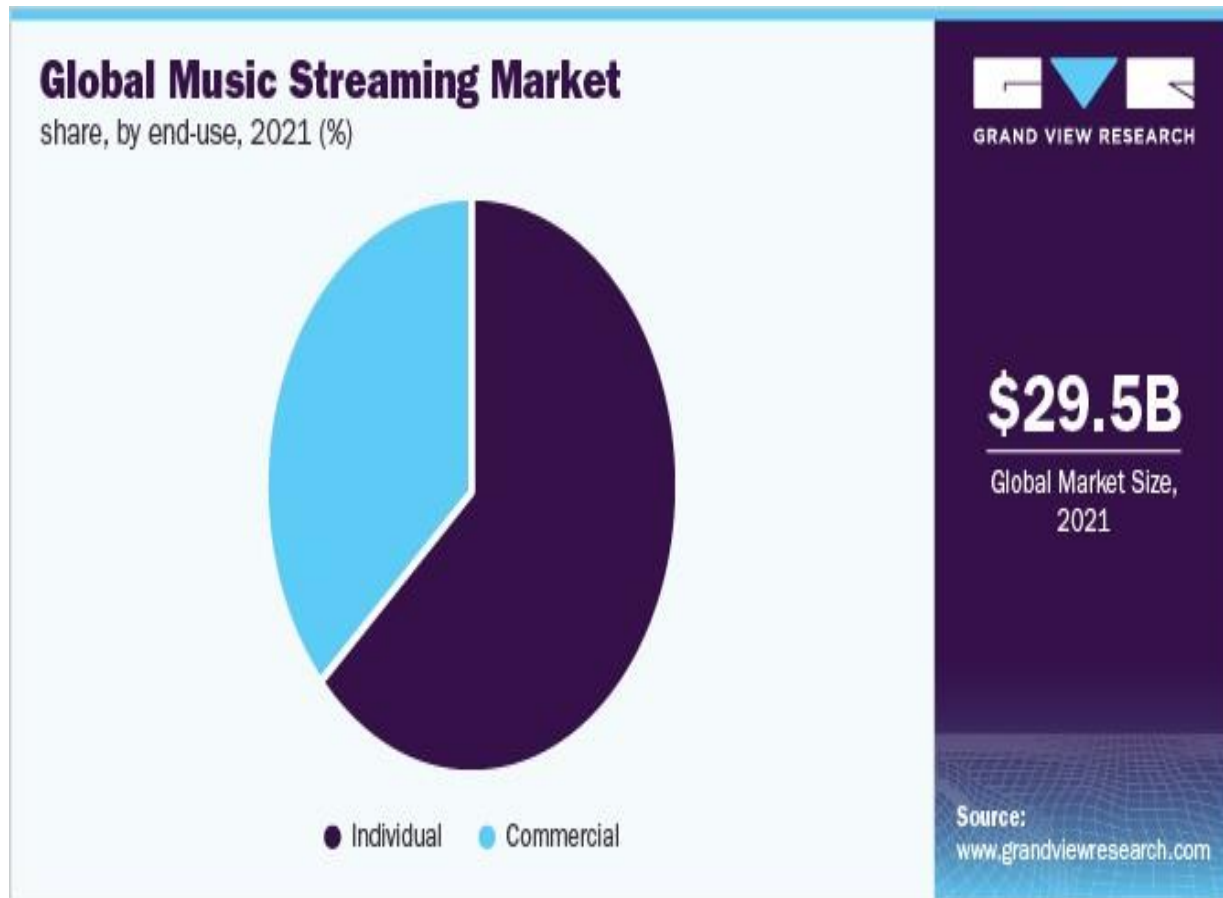


Figure 1. Market value graph

The world is tuning in to the sweet sound of music streaming, with the global market hitting a high note at USD 29.45 billion in 2021. The melody is expected to continue its crescendo, with a compound annual growth rate of 14.7% from 2022 to 2030, fueled by the rise of digital platforms and the use of smart devices. With offerings ranging from audio and podcasts to music videos, streaming services are striking the right chord with users through features like personalized recommendations and effortless connectivity on apps and browsers. As the podcast genre expands on these platforms, the market's rhythm is set to amplify.

Timeline Of the reported problem

- **2000s:** The rise of digital music and file-sharing services such as Napster, Kazaa, and Limewire.
- **2008:** The launch of Spotify, which becomes one of the most popular music streaming apps.
- **2014:** Taylor Swift removes her music from Spotify, citing concerns about the low royalties paid to artists.
- **2015:** Apple Music is launched, offering a new competitor in the music streaming market.
- **2016:** Prince removes his music from all streaming services except Tidal, leading to a debate about exclusive content deals.
- **2018:** Spotify goes public, with a valuation of over \$26 billion.
- **2019:** Apple Music surpasses Spotify in paid subscribers in the United States.
- **2020:** The COVID-19 pandemic leads to a surge in music streaming as people stay home and seek entertainment online.
- **2021:** Reports emerge about the potential impact of new music streaming regulations proposed in the US, which could affect how much artists are paid for their work.

Existing Solutions

There are many existing solutions in the music streaming app market. Here are some of the most popular ones:

- **Spotify:** It is one of the most popular music streaming apps, offering a vast library of songs, podcasts, and playlists, personalized recommendations, and social features. Spotify has many integrations that allow users to share their favorite songs, albums and playlists with their friends and followers on social media. This will help create a sense of community and link music and can introduce users to new songs their friends are listening to. Spotify also provides access to a variety of podcasts, audiobooks, and other content. This means users can use the app for various entertainment in one place. Spotify has a free version with limited features, as well as a premium version that offers additional benefits such as ad-free listening, great sound for offline play, and more.
- **Apple Music:** A music streaming service offered by Apple developed in 2015, with a similar range of features to Spotify, including exclusive content and radio shows. Apple Music integrates with all Apple devices such as iPhone, iPad and Mac. It offers a free trial period as well as a monthly subscription option that is very affordable and comparable to other music services.
- **Amazon Music:** A music streaming service offered by Amazon, with a focus on integrating with other Amazon devices and services.
- **Tidal:** It is a music streaming service launched in 2014 and owned by Jay-Z and

a group of other music artists. It is a music streaming service known for its high-quality audio and exclusive content, including albums and music videos. It has over 70 million songs from different genres and artists. This means users can easily find and listen to their favorite songs and discover new songs they may not have seen.

- **Pandora:** It is music streaming app launched in 2005 that creates personalized radio stations based on user preferences and song selection. Pandora offers both ad-supported and subscription-based options for users. The subscription option provides additional features such as ad-free listening, higher audio quality, and offline playback. It is integrated with a range of smart devices, including Amazon Echo and Google Home. This means that users can easily access and control their music using voice commands.
- **Deezer:** Deezer is a music streaming service launched in 2007. It has a large music library of songs in different formats and is known for its recommendations and features. It provides access to over 73 million songs, making it one of the largest music services. Deezer's "Flow" feature is a personalized radio station that plays shuffles based on the user's listening history and preferences. It's a great way to discover new music and artists you wouldn't find otherwise. It also provides access to a wide variety of podcasts, including original content and popular international shows.
- **YouTube Music:** A music streaming service launched in 2018 offered by YouTube, with a focus on music videos and live performances. It uses advanced technology to customize the user experience and offers recommendations based

on the user's listening history and preferences. This helps users find new music they like and can create a harmonious and enjoyable listening experience. YouTube Music offers users ad-supported and subscription-based options. The subscription option offers additional features such as ad-free listening, better sound quality and offline playback. YouTube Music has a free version with limited features as well as a monthly subscription option that is very affordable and comparable to other music services.

- **SoundCloud:** A platform for independent artists to upload and share their music, with a growing library of songs and features such as reposting and commenting. It is an online platform for music sharing and discovery that allows users to upload, promote and share their own music or listen to music uploaded by other users. Founded in 2007, SoundCloud has grown into a popular destination for independent musicians, DJs and music lovers, with a large and strong client base around the world.
- One of the unique features of SoundCloud is its focus on social networks, allowing users to follow, like and comment on tracks and connect with other users who share their experiences. The platform also offers a variety of tools and analytics to help artists and producers build their audience and track their progress.

Problem Definition

The main objective is to create application-based music player that enables users to stream their preferred music. The music player should have an intuitive interface that makes it simple for users to explore, search, and play music tracks. It should also be quick and easy to use.

There is a growing demand for online music streaming services, with users seeking convenient, personalized, and high-quality access to a vast library of songs and artists. However, there are several challenges associated with developing and maintaining a successful music streaming app, including technical issues such as audio quality and compatibility, concerns about the impact on the music industry and artist royalties, and the need to provide a unique and engaging user experience to stand out in a crowded market. The problem to be addressed by the Music Streaming App project is how to create a high-quality, user-friendly music streaming app that meets the needs and expectations of today's music consumers, while addressing these challenges and ensuring the sustainability and profitability of the service.

CHAPTER 3.

DESIGN FLOW/PROCESS

3.1 Feature/characteristics identification

- **User Authentication:** The application must require users to register and log in to access the music. User authentication ensures that only authorized users can access the content, and their preferences and playlists can be saved and accessed across devices.
- **Music Library:** The application must have a vast collection of music that users can choose from. The music library should be regularly updated to provide users with the latest releases and popular tracks.
- **Audio Quality:** The application must provide high-quality audio playback to enhance the user experience. The audio quality must be consistent across different devices and internet speeds.
- **Search Functionality:** The application should allow users to search for music based on artists, albums, genres, and other parameters. The search function must be quick, accurate, and user-friendly.
- **Playlists:** Users should be able to create and manage their playlists, and the application should provide features like automatic playlist generation based on user preferences, smart shuffle, and repeat options.
- **Offline Playback:** The application should allow users to download music and listen to it offline without an internet connection. This feature is particularly important for users with limited internet connectivity.

- **Social Integration:** Users should be able to share music and playlists on social media platforms like Facebook, Instagram, and Twitter.
- **Personalization:** The application should provide personalized recommendations based on user listening history, preferences, and search history.
- **Recommendation Engine:** The application must provide personalized recommendations to users based on their listening history, preferences, and search history. This feature involves implementing machine learning algorithms that analyze user behavior to make accurate recommendations.
- **Security:** The application must ensure that user data such as login credentials and payment information is secure and protected from unauthorized access.

3.2 Constraints Identification

- **Scalability:** The application must be able to handle a large number of users, requests, and traffic without sacrificing performance. Scalability involves considering issues such as load balancing, caching, and database optimization.
- **Compatibility:** The application must be compatible with different platforms, devices, and web browsers. This constraint involves considering different operating systems, screen resolutions, and hardware specifications.
- **Performance:** The application must provide a fast and responsive user experience, including quick loading times, smooth playback, and accurate search results. Performance involves optimizing code, minimizing latency, and reducing server load.

- **Availability:** The application must be available and accessible to users 24/7 without downtime or interruptions. This constraint involves implementing backup and recovery mechanisms, load balancing, and failover strategies.
- **Resource Constraints:** The application must be optimized to run on limited resources, including processing power, memory, and storage. This constraint involves implementing efficient algorithms, reducing redundant data, and minimizing the use of external APIs.
- **Budget Constraints:** The application must be developed within the allocated budget, which includes development costs, hosting fees, and marketing expenses. This constraint involves prioritizing features and functionalities based on their impact on user experience and revenue generation

3.3Analysis of features and finalization, subject to constraints

Legal Constraints: The application must comply with legal constraints, including music licensing agreements, copyright laws, and data privacy regulations.

Scalability: The application must be able to handle a large number of users, requests, and traffic without sacrificing performance. Scalability involves considering issues such as load balancing, caching, and database optimization.

Compatibility: The application must be compatible with different platforms, devices, and web browsers. This constraint involves considering different operating systems, screen resolutions, and hardware specifications.

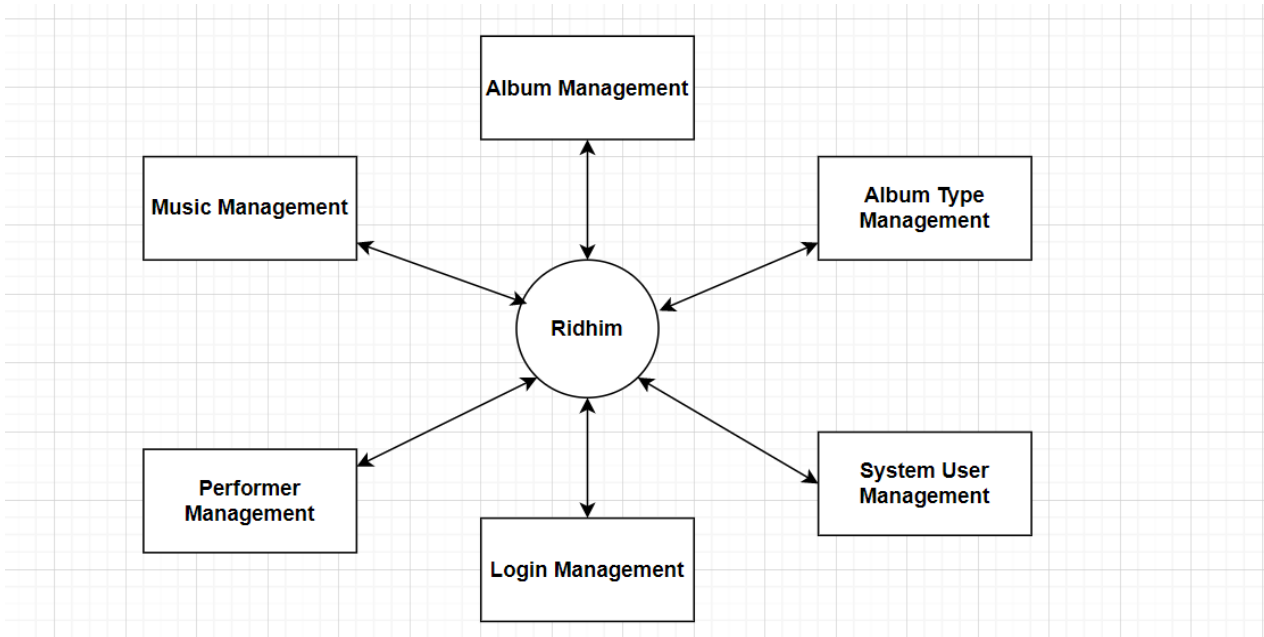
Performance: The application must provide a fast and responsive user experience, including quick loading times, smooth playback, and accurate search results. Performance involves optimizing code, minimizing latency, and reducing server load.

Security: The application must ensure that user data such as login credentials and payment information is secure and protected from unauthorized access. This constraint involves implementing encryption, firewalls, and access controls.

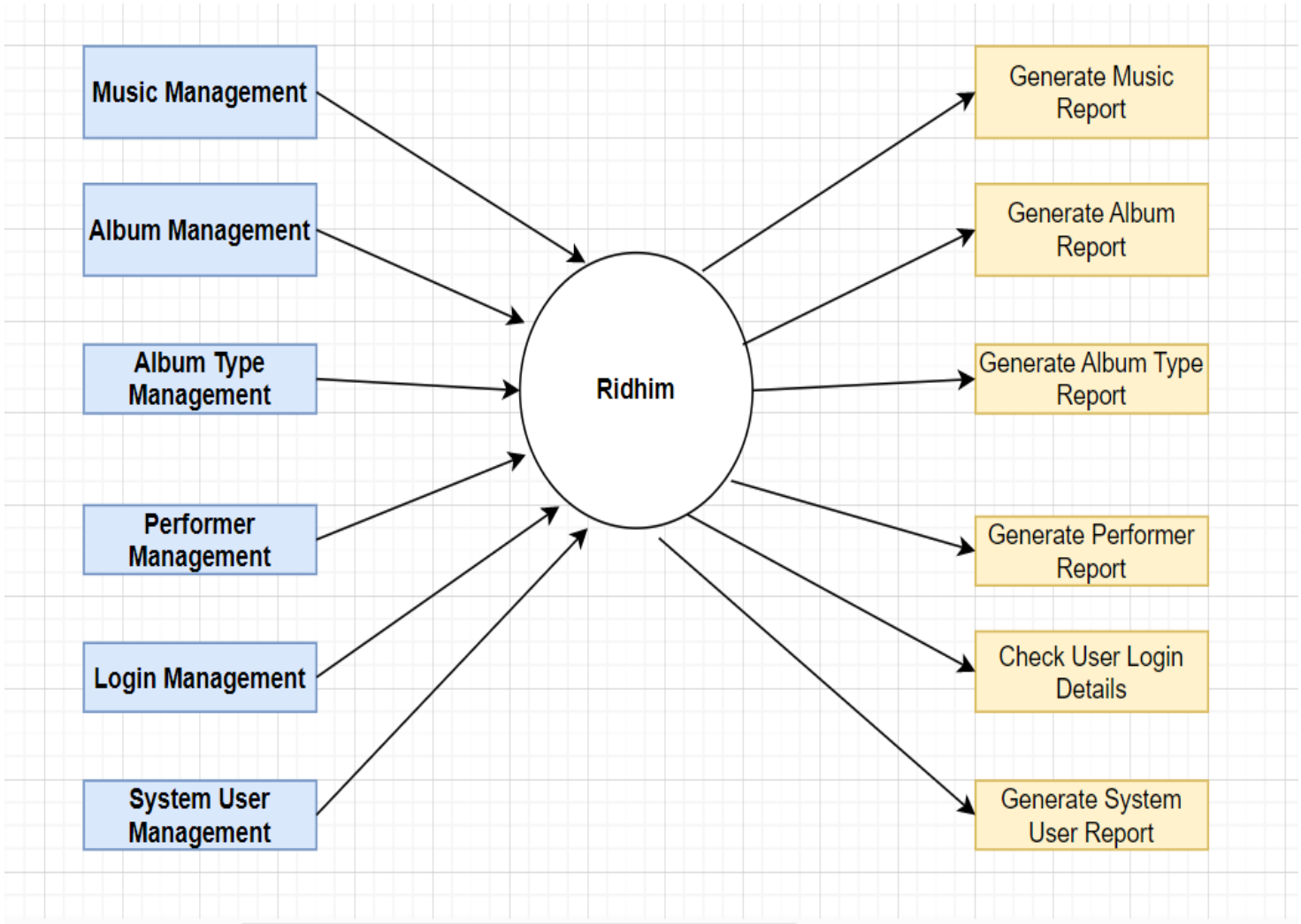
Budget Constraints: To ensure the project stays within the allocated budget, the application should prioritize features based on their impact on user experience and revenue generation. The development team should also consider open-source solutions, use cost-efficient cloud infrastructure, and optimize development processes to minimize costs.

3.4 Design Selection

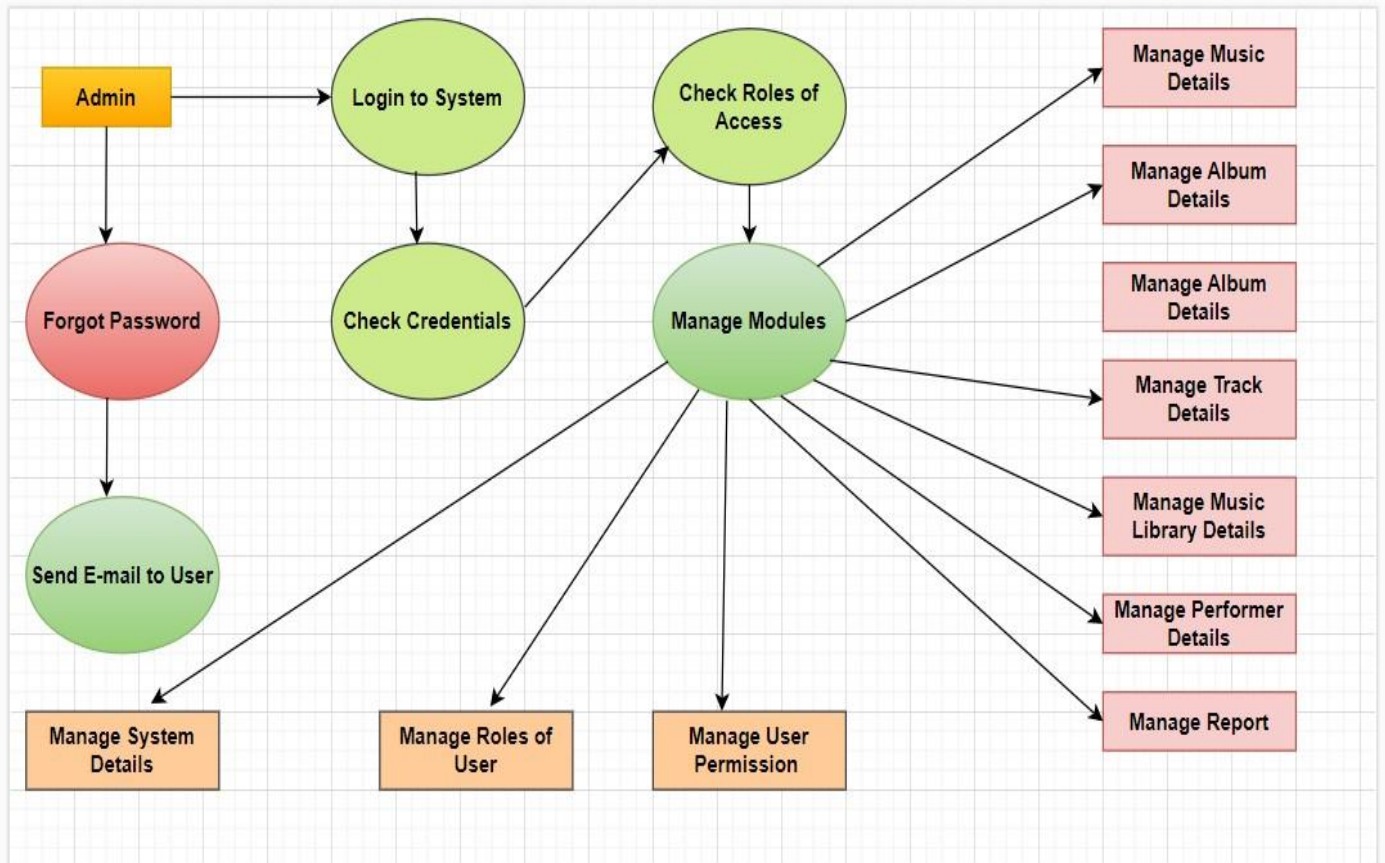
3.4.1 DFD (level 0)



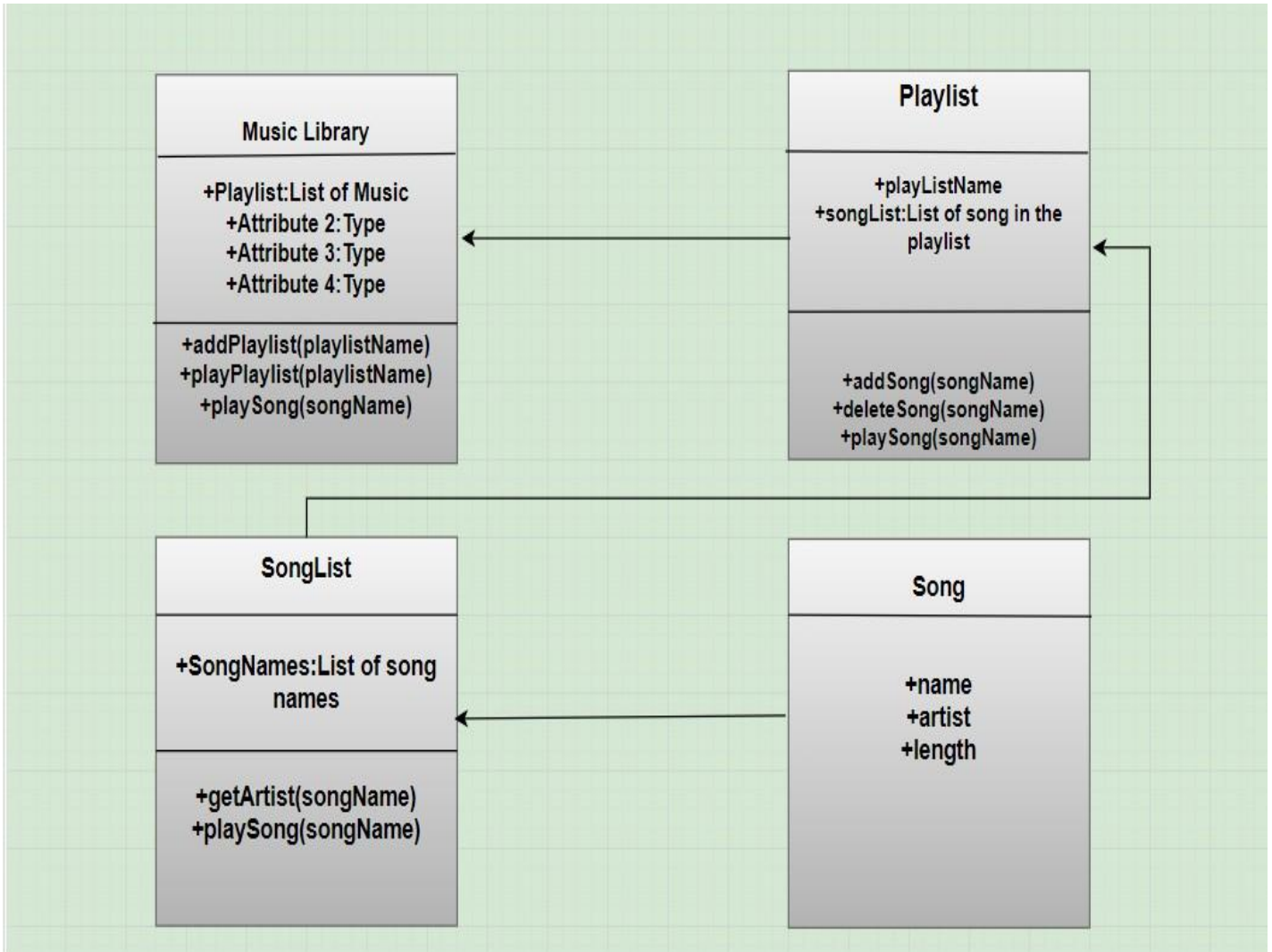
3.4.2 DFD (level 1)



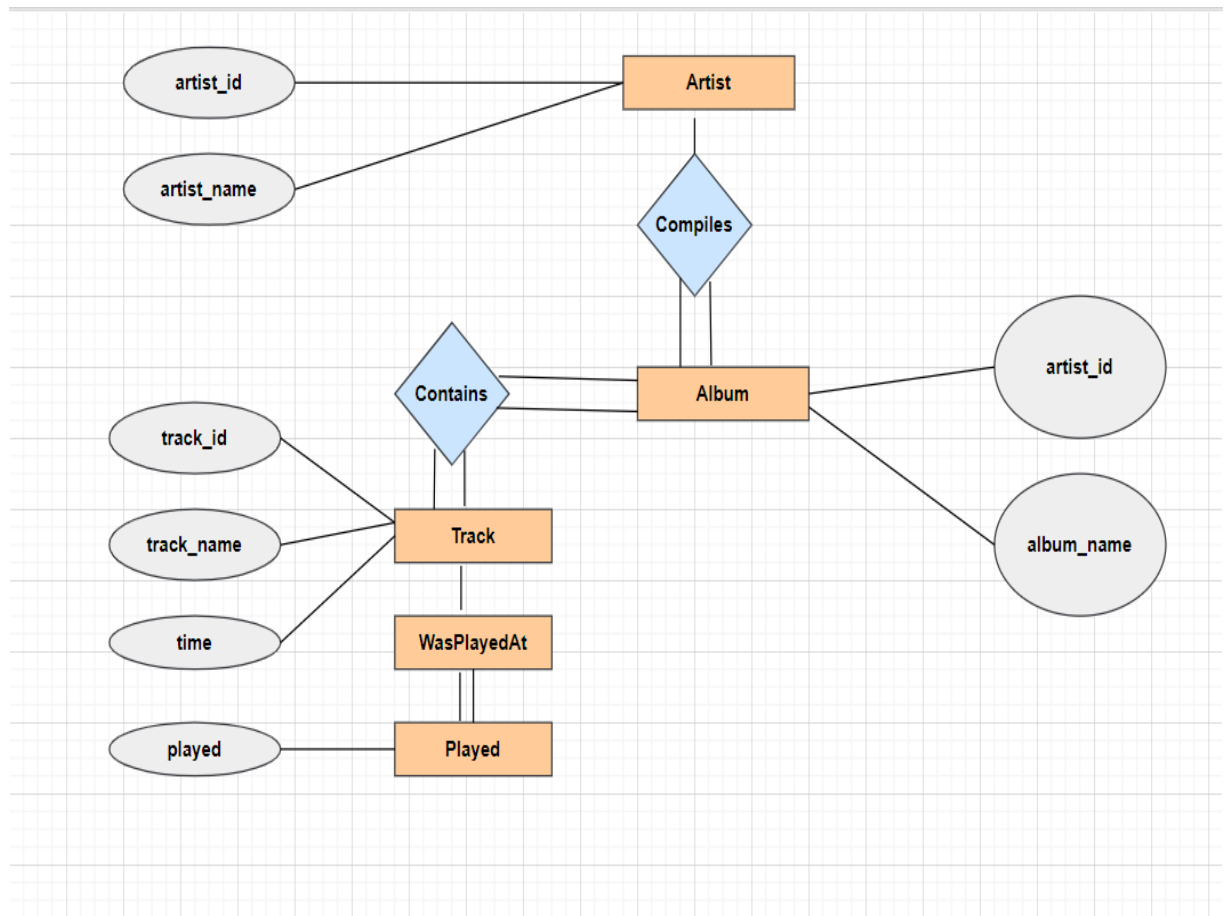
3.4.3 DFD (level 2)



3.4.4 UML Class Diagram



3.4.5 ER Diagram



CHAPTER 4

RESULTS ANALYSIS AND VALIDATION

4.1 TECHNOLOGIES USED

KOTLIN

Kotlin is a modern programming language that runs on the Java Virtual Machine (JVM) and can be used to develop Android applications. Kotlin was developed by JetBrains and released in 2011, and it has since gained popularity as an alternative to Java for Android development.

Kotlin is a statically typed language that is interoperable with Java, which means that developers can use Kotlin and Java code together in the same project. Kotlin offers many features that make it more concise and expressive than Java, such as type inference, null safety, lambdas, extension functions, and coroutines.

XML

XML stands for eXtensible Markup Language. It is a markup language used to store and transport data. XML is similar to HTML in that it uses tags to structure data, but it is not intended for use in displaying data in a web browser. Instead, XML is used as a format for exchanging data between different applications and systems.

XML is a flexible and extensible format that allows developers to define their own tags and structure data according to their needs. XML tags are enclosed in angle brackets (< >), and they are used to define the structure of data.

FIREBASE AUTH

Firebase Auth is a service provided by Google's Firebase platform that enables developers to add authentication and authorization to their applications with minimal effort. Firebase Auth provides several authentication options, including email and password authentication,

phone number authentication, social authentication (using services like Google, Facebook, Twitter, and GitHub), and anonymous authentication.

Firebase Auth simplifies the authentication process for developers by providing a client-side SDK that integrates with the Firebase backend. This SDK handles user authentication and securely stores user data, including user IDs, passwords, and other authentication tokens. It also provides an API for developers to manage user accounts and handle authentication events.

Firebase Auth provides a secure authentication process that includes hashing and salting user passwords, as well as supporting multi-factor authentication (MFA) to add an extra layer of security to user accounts. Firebase Auth also integrates with other Firebase services, such as Firebase Realtime Database, Cloud Firestore, and Cloud Functions, to enable developers to create secure and scalable applications with ease.

Firebase Auth also provides built-in UI components that developers can use to create a custom authentication flow in their applications. These components provide a user-friendly interface for signing in and signing up, as well as password reset and email verification workflows.

.2 IMPLEMENTATION OF SOLUTION

The project required a lot of thinking on how and what features should be implemented. Keeping all the basic necessary requirements a project should have as well as bringing out some less executed concepts, we have summarized some features the app contains as follows:

4.1.1 Feature 1: User Login

One of the main features of the Ridhim application is the login- based authentication. The user registers himself/herself and logs in using his/her user-id and password. After logging in, a dashboard will be appeared which will persist until and unless a user either logs out. When you Log out, the user won't be able to see the content and again you come in the login page.



Figure 1: USER Login authentication

4.1.2 Feature 2: Interactive GUI

As You can see the GUI of the application is very fascinating. The user will like to use the application and will enjoy the music.

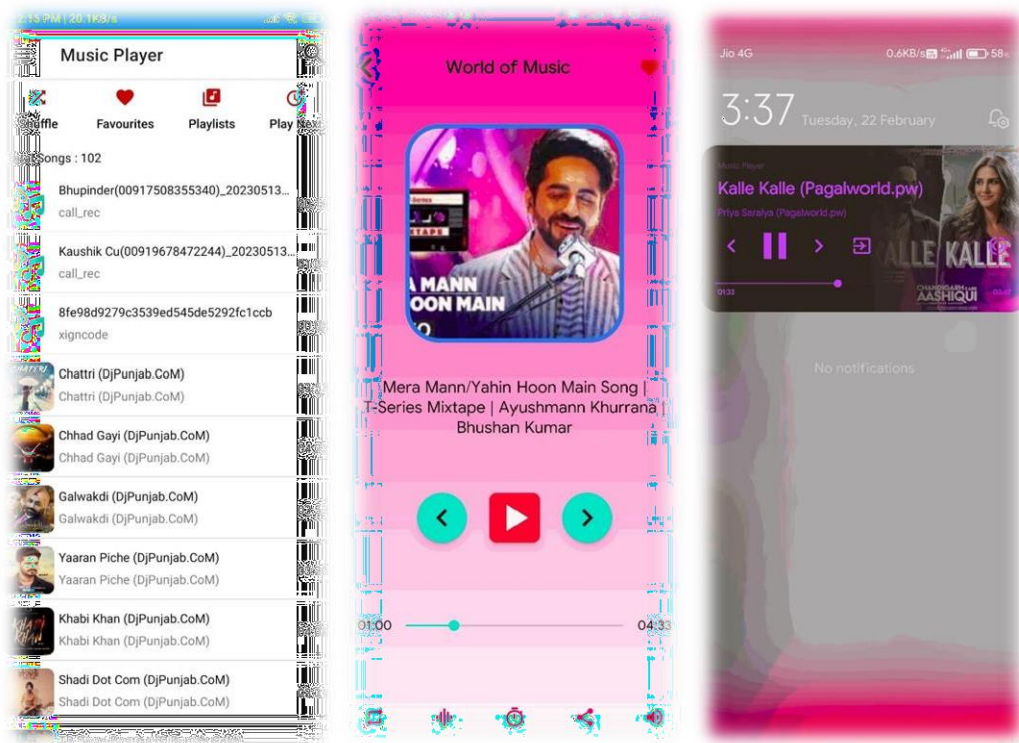


Figure 2: Interactive GUI

4.1.3 Feature 3: User Sign-up

One of the most common features most applications have is the sign-up feature. This application allows a user to create their account and proceed with further operations.

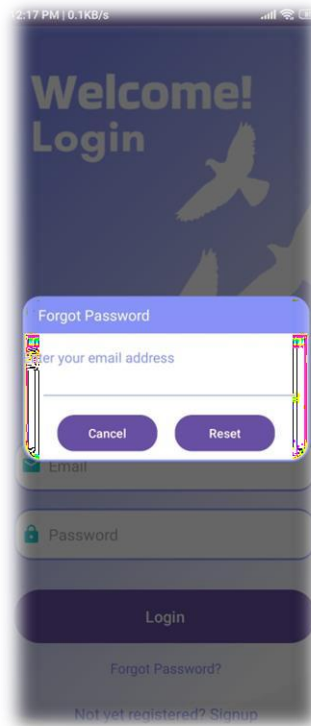


Figure 3: Sign-up option

4.1.4 Feature 4: Different option in Ridhim Application

Like Forgot Password, Playlists, Favourite songs etc are there. So, let us discuss all the option one by one

1. **Forgot Password:** In this we are able to recover the password and save it in database.



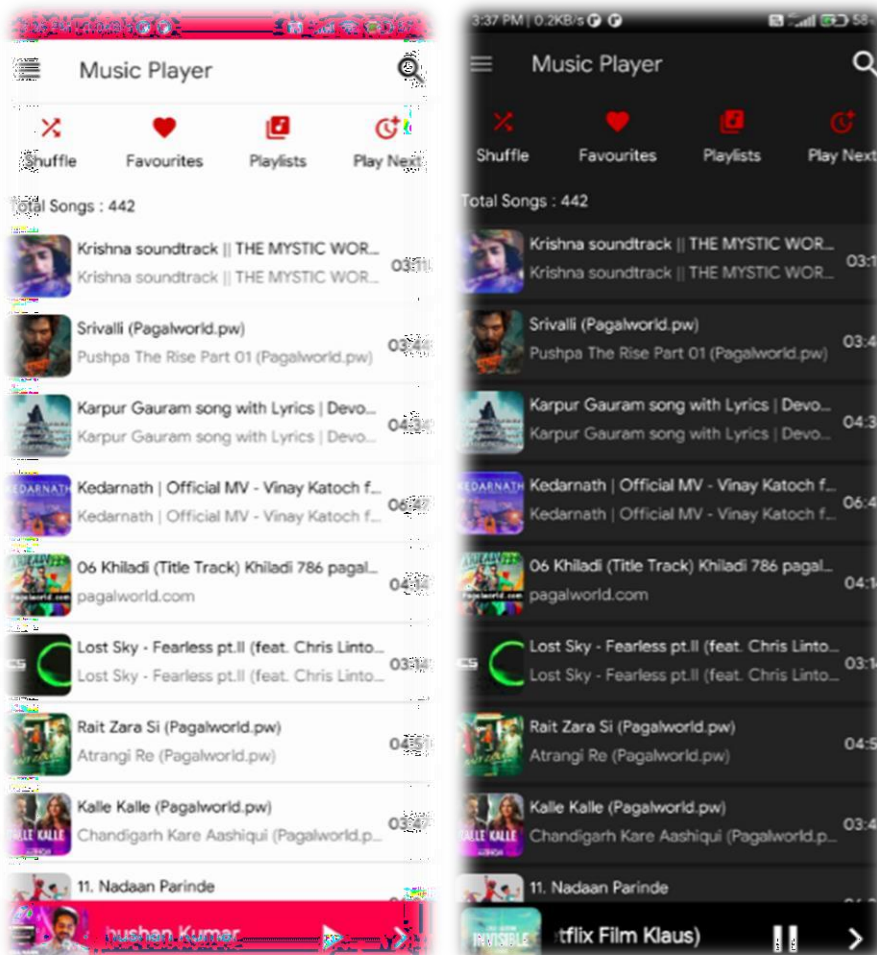
2. **Playlist:** In this we are able to create our playlist for non stop music listening.



3. Favourite Songs: In this we are able to add our favourite songs to listen them again.



4. Dark Theme (Using Black Theme in Settings) : In this we are able to change the themes as required.

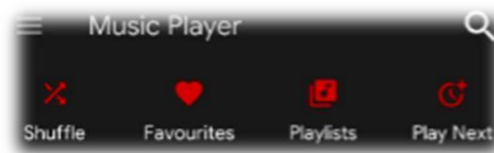


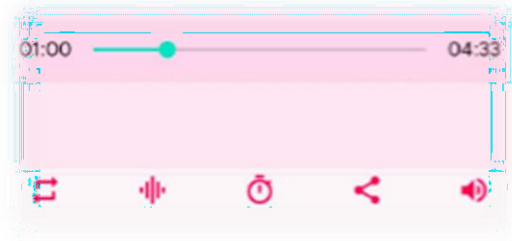
- **Background Playing with Custom Notification:** In this we are able to change the song in notifications only.



5. Various other features are:

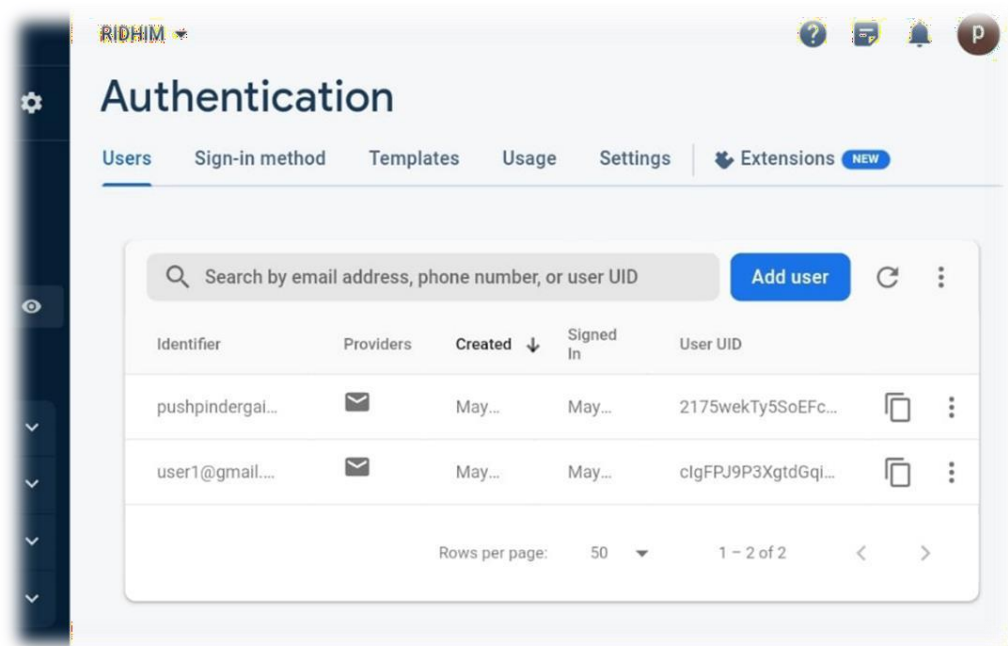
- Shuffle
- Playlists
- Play/Pause Audio Using EarPhones
- Play Next Feature (i.e. Now You Can Schedule Upcoming Songs)
- Custom Color Gradient According To Each Song Image
- Favourite Songs
- Create & Add Playlists
- Sleep Timer
- Audio Booster
- Built-in System Equalizer
- Audio Booster or Audio Amplifier
- Custom Themes
- Swipe to Refresh UI
- Decent UI with New Material Widgets

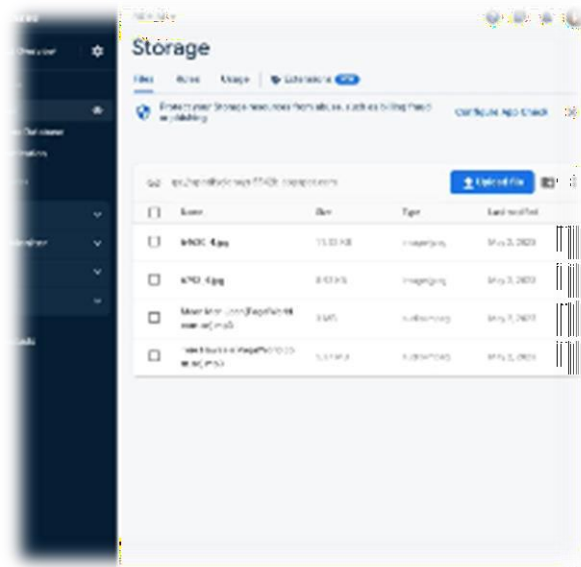




4.1.5 Feature 5: Data Storage

The app offers the features of user signup and login. After performing the desired operations and logging out from the app successfully, all the data, the user has created will not be lost and will persist in the database. The next time, the user logs in, he/she will be able to see the content created by them during the last login. We use the Firebase to access the data.





CHAPTER 5.

CONCLUSION AND FUTURE WORK

5.1 Conclusion

The App provides a platform to explore music .Users can login to their accounts with the help of Google Authentication, which offers a secure and faster way of setting up the profiles. A categorized search will be available for the users as well. The project is user friendly and easy to access, which makes it a perfect platform for socializing.

It provides an easy and convenient way to access music anytime, anywhere. Users can stream or download millions of songs to their device with just a clicks, making it easy for them to enjoy their favorite music anytime, anywhere. These apps use advanced algorithms to customize the user experience and offer recommendations based on the user's listening and preferences. This helps users discover new music they might not find otherwise and can create a more engaging and enjoyable listening experience.

These apps provides access to a large library of songs spanning many genres, artists, and eras. This means users can easily search for new movies and artists or rediscover old favorites all in one place. Many music apps offer integrations that allow users to share their favorite songs and playlists with friends and followers on social media. This will help create a sense of community and link music and can introduce users to new songs their friends are listening to. Music app provides a great way to access and enjoy music. While many apps offer free versions with limited features, premium versions often offer additional benefits such as ad-free listening, offline playback, and better sound.

In conclusion, developing a music player Android app can be a challenging yet rewarding project that requires a combination of technical skills and creativity. With the use of Kotlin , XML, and Firebase, developers can build a feature-rich music player

Overall, a music player app can provide a useful tool for music enthusiasts and offer a unique platform for music sharing and discovery. By incorporating best practices and leveraging modern technologies, developers can create a music player app that stands out in a crowded market and delivers a satisfying experience to users.

5.2 Future Work

There are many improvements that can be done and features that can be added in the project but they surpass the current scope of the project. Some of features that can be added and improvements that can be done in the project includes the following:

- ❑ **User Interface and Experience Enhancements:**

Continuous user interface (UI) and user experience (UX) improvements can be made to enhance the app's overall look, feel, and ease of use. Conducting user research, gathering feedback, and incorporating user-centric design principles can help refine the app's interface and make it more intuitive and visually appealing.

- ❑ **Social Interactions and Community Features:**

Implementing social features such as user profiles, follower systems, and the ability to share music or playlists with friends can foster a sense of community within the app. Additionally, incorporating features like real-time chat or comments can allow users to engage with each other, share their thoughts on music, and discover new tracks through social interactions.

- ❑ **Offline Mode and Cross-Platform Compatibility:**

Providing an offline mode feature would allow users to download songs and playlists for offline listening, which can be a significant value-add for users with limited connectivity or during travel. Moreover, expanding the app's compatibility across different platforms, such as iOS or web browsers, can broaden its user base and increase accessibility.

- ❑ **Enhanced Audio Quality and Integration with Audio Services:**

Improving audio quality by supporting high-quality audio formats, implementing equalizer settings, or integrating with popular audio services can provide users with a seamless and premium listening experience.

- ❑ **Data Analytics and Insights:**

Implementing robust data analytics capabilities can help gather insights into user behavior, preferences, and trends. This data can be used to further personalize recommendations, optimize the

app's features, and make data-driven decisions for future updates and enhancements.

□ **Security and Privacy Enhancements:**

Strengthening security measures, such as implementing secure authentication protocols, encrypted data transmission, and ensuring user privacy compliance, is crucial for protecting user data and maintaining trust within the app.

□ **Performance Optimization:**

Continuously optimizing the app's performance by implementing caching mechanisms, reducing loading times, and minimizing resource consumption can lead to a smoother and more efficient user experience.

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