SYNOPSIS

ON

AI - Powered Music Recommendation system

IN PARTIAL FULFILLMENT OF

MASTER OF COMPUTER APPLICATION BY

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1. Introduction

In today's era of digital music platforms and vast song libraries, listeners often face the challenge of information overload, making it difficult to discover music that truly matches their unique tastes and moods. To address this issue, this project proposes the development of an intelligent Music Recommendation System **(**MRS**)** leveraging Artificial Intelligence **(**AI**)** and Machine Learning **(**ML**)** techniques.

2. Existing System and Need for System

2.1 Existing System

Many of these rely on basic filtering techniques, such as popularity charts, trending playlists, or user-curated lists, rather than deep personalization. While some advanced platforms do use AI-based models, they are often limited in transparency, heavily influenced by global trends, and may not always capture the individual user's exact mood, preference, or context.

2.2 Need for System

There is a strong need for an AI-powered Music Recommendation System that goes beyond traditional approaches by learning from individual user behavior, preferences, and listening patterns**.** With millions of songs available on streaming platforms, users require a system

3. Scope and objectives of System

The AI-Powered Music Recommendation System (MRS) is designed to deliver personalized and intelligent music suggestions by analyzing user preferences, listening history, and audio features such as tempo, genre, and mood. The system can be deployed as a standalone application or integrated with existing music streaming platforms.

4. List of modules/Functionalities with description

1. Admin Module:

Purpose: To control and manage the overall system.

Features:

1. Manage and update music database.
2. Monitor user activity and system performance.
3. Handle security, scalability, and optimization.

Key Technologies:

Frontend: HTML, CSS, JavaScript

Backend: Python

Database: MySQL

2. User Management Module:

Purpose: Handles user registration, login, and profile

Features:

1. User registration and authentication.
2. Profile creation with initial music preferences.
3. Secure storage of user credentials and data.

Key Technologies:

Frontend: HTML, CSS, JS

Backend:Python

Database: MySQL

3. Music Database Module:

Purpose: Stores and manages information

Features:
1. Storage of music metadata (title, artist, album,)
2. Audio feature data storage (tempo, pitch, energy, mood).
3. Efficient retrieval of data for recommendation.

Key Technologies:

Database:MySQL

Backend: Python

4. Recommendation Engine Module:

Purpose: The core module that applies AI/ML.

Features:

1. Recommends songs based on similar user listening patterns.
2. similar to those a user has liked, based on audio features.

Key Technologies:

3. Collaborative Filtering
4. Content-Based Filtering
5. Hybrid Recommendation

Backend: Python

5. Search and Playlist Management Module:

Purpose: Allows users to search for songs, artists, or genres.

. Features:

1. Search by title, artist, album, or genre.
2. Dynamic playlist generation based on mood, activity.
3. User ability to save, edit, and share playlists.

Key Technologies:

Backend: Python

6. Feedback and Learning Module:

Purpose: Captures user feedback to improve system accuracy and personalization

Features:

1. Rating system (like/dislike, star rating).
2. Recommendations based on feedback.
3. Continuous improvement of ML models

Key Technologies:

Backend: Python

Database: MySQL

7. Report

Purpose: provide insightful summaries and analytical reports
Features:
1. User Listening History Reports
2. Personalized Analytics
3. Recommendation Performance Reports

Frontend: HTML,

CSS, JS

Backend:Python

Database: MySQL

5. System Requirement Specification

1 Server Side Requirement
Requirement Specification
5.1 Hardware Requirements: - Processor Minimum Dual-Core i5. RAM: 8GB ram HDD Minimum 100 GB Free Space
5.2 Software Requirements: Operating System: Windows Server Database: MySQL Cloud
Front End:HTML5, CSS3, JavaScript
Server Side: Script Python (Core language for AI/ML) Software Development Tool PyCharm / VS Code / Anaconda
2.Client Side Requirement Requirement Specification
5.3 Hardware Requirements: -Processor: Standard Processor RAM Standard RAM
5.4 Software Requirements: - Operating System: Windows Requirement: Specification Browser: Google Chrome

6. Proposed System

The proposed AI-Powered Music Recommendation System (MRS) is designed to overcome the limitations of existing systems by providing personalized, intelligent, and adaptive music recommendations. Unlike traditional systems that rely mainly on static playlists or popularity-based charts, this system leverages Artificial Intelligence (AI) and Machine Learning (ML) techniques to deliver highly accurate suggestions tailored to each individual user.

7. Feasibility Study

7.1 Technical Feasibility

Machine Learning: Algorithms like collaborative filtering, content-based filtering, and hybrid models can be implemented using Python libraries

Frontend & Backend: React.js/Angular for the user interface and Node.js/Django/Java Spring Boot for backend development.

Databases: SQL or NoSQL databases (MySQL, PostgreSQL, MongoDB) can efficiently handle user data and music metadata.

7.2 Economic Feasibility

Development tools and frameworks are mostly open-source and free (Python, React, Node.js, Tensor Flow).

Initial costs are limited to hosting, storage, and optional premium APIs.

The system can later be monetized by integrating with streaming services or through subscription models.

7.3 Operational Feasibility

1. Users can easily interact with the system through a user-friendly interface.
2. Recommendations improve continuously via feedback loops, ensuring higher satisfaction.
3. Administrators can manage the system with minimal training.