Project Proposal Document

Project Title:

Intelligent Movie Recommendation System with Visual Analytics

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1. Introduction

In today's digital world, choosing what to watch is overwhelming due to the massive number of movies available online. Viewers often get confused or spend too much time searching for content. Our project proposes a machine learning–based movie recommendation system combined with interactive dashboards using Power BI. The aim is to simplify the movie discovery process through intelligent suggestions and insights into genre trends, rating patterns, and blockbuster analysis.

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2. Problem Statement

With the rise of OTT platforms, users face difficulty in finding relevant content suited to their tastes. Most platforms offer basic recommendations, but very few allow insights into popularity, success rate, or genre patterns. Our system solves this by recommending movies based on content similarity (not just popularity), while also enabling decision-makers to analyse movie success patterns using dashboards.

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3. Objectives

- Recommend similar movies based on metadata using ML algorithms.
- Fetch and display dynamic movie posters using TMDB API.
- Allow random suggestions for new users.
- Build visual dashboards showing genre popularity, revenue analysis, and cluster-based movie grouping.

- Present useful KPIs and filters for business analysis.

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4. Scope of the Project

- Use NLP (CountVectorizer) and cosine similarity for recommendation.
- Frontend built using Streamlit, with real-time interaction.
- Power BI dashboard with charts, cards, slicers, clustering insights.
- Extendable to books, songs, or product recommendation.
- Lightweight and can be hosted locally or on cloud.

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5. Tools & Technologies Used

Tool	Purpose
Python (pandas, sklearn, numpy)	ML processing and similarity computation
Streamlit	UI development
TMDB API	Fetch movie posters
Power BI	Dashboard and visual analytics
Pickle	Saving trained model
Jupyter Notebook	Model development and testing

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6. Dataset Description

- Source: Kaggle “The Movies Dataset”
- Supporting datasets: Credits, Keywords, Ratings
- Key columns used: title, genres, keywords, cast, crew, overview, popularity, vote_average, revenue, budget

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7. Expected Outcome

- Fully functional ML-powered movie recommender
- Simple web interface using Streamlit

- Visual analytics dashboard for understanding movie success patterns .
- A complete project blending machine learning, UI, and data analytics .