**KIET GROUP OF INSTITUTIONS, Ghaziabad**

**SYNOPSIS**

***ON***

Movie Recommendation System

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*Computer Science and Engineering*

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# INTRODUCTION

# A recommendation system, sometimes known as a recommendation engine, is a paradigm for information filtering that aims to anticipate user preferences and offer suggestions in accordance with these preferences. These technologies are now widely used in a variety of industries, including those that deal with utilities, books, music, movies, television, apparel, and restaurants. These systems gather data on a user's preferences and behavior, which they then employ to enhance their future suggestions.

# There are many various kinds of movies, such as those meant for amusement, those meant for teaching. children's animation movies, horror movies, and action movies. Watching movies is relaxing. Distinguished by their various genres, such as humor, suspense, animation, action, etc. Another approach to differentiate between movies is to look at their release year, language, director, etc. When watching movies online, there are many to choose from in our list of top picks. We may find our favorite movies among all of these different kinds of movies with the aid of movie recommendation systems, which saves us the stress of having to spend a lot of time looking for our preferred movies.

# As a result, it is essential that the system for suggesting movies to us is very trustworthy and gives us recommendations for the films that are either most similar to or identical to our tastes. Recommendation systems are being used by a lot of businesses to improve customer interaction and the purchasing experience. The most significant advantages of recommendation systems are client happiness and income.

# ABSTRACT

# Each of us needs entertainment to recharge our spirits and energy in this fast-paced world. Our confidence for work is restored by entertainment, and we work more ardently as a result. We can watch our favorite movies or listen to our favorite music to reenergize ourselves.

# Since finding chosen movies will take more and more time, which one cannot afford to waste, we can use more reliable movie recommendation algorithms to watch good movies online. In this paper, a hybrid approach that combines content-based filtering, collaborative filtering, using Support Vector Machine as a classifier, and genetic algorithm is presented in the proposed methodology.

# Comparative results are shown, showing that the proposed approach shows an improvement in the accuracy quality, and scalability of the movie recommendation system than the pure approaches in three areas: accuracy, quality, and scalability. The advantages of both approaches are combined in a hybrid strategy, which also seeks to minimize their negative aspects.

# OBJECTIVE

Our goal is to enhance the accuracy of our recommendation system by integrating multiple recommendation techniques and leveraging advanced machine learning algorithms like SVM. By doing so, we aim to ensure that users receive suggestions that closely match their preferences, providing a more reliable and precise recommendation experience.

We strive to provide personalized recommendations that reflect each user's unique tastes, interests, and viewing history. By analyzing user behavior and preferences, our system will tailor its recommendations to each individual user. This approach ensures a more engaging and satisfying movie-watching experience, making our service more relevant and enjoyable.

Additionally, we aim to improve the scalability and efficiency of our recommendation system. By optimizing the performance of our algorithms and infrastructure, we will ensure that our system can handle large volumes of users and movie data without compromising speed or reliability. This will enable us to deliver consistent and high-quality recommendations even as our user base grows.

# SCOPE

The project's scope includes the conceptualization, development, implementation, and evaluation of a comprehensive movie recommendation system. This initiative aims to overcome the limitations of existing recommendation systems by employing advanced techniques and methodologies, providing users with more precise, personalized, and efficient recommendations.

Key components of the project scope are:

Algorithm Development: The project will focus on creating and refining innovative recommendation algorithms, such as content-based filtering, collaborative filtering, Support Vector Machine (SVM) classification, and genetic algorithms. These algorithms will form the core of the recommendation system, allowing it to analyze user preferences and generate customized movie recommendations.

Data Collection and Preprocessing: A crucial aspect of the project is gathering and preprocessing movie-related data from various sources, including user ratings, movie metadata, and user preferences. This data will be meticulously curated, cleansed, and standardized to ensure compatibility with the recommendation algorithms and maintain data integrity throughout the recommendation process.

System Architecture: The project will involve designing and implementing the system architecture that supports the movie recommendation system. This includes building the backend infrastructure for data storage, retrieval, and processing, as well as the frontend interface for user interaction and recommendation presentation.

User Interface Design: Creating a user-friendly interface is vital for encouraging user engagement and interaction with the recommendation system. The project will focus on designing an intuitive and visually appealing user interface that enables users to input preferences, explore recommendations, and provide feedback on suggested movies.

## Reports of E-Learning Management System:

* Overview of the project's goals, scope, and key findings.
* Background on the need for movie recommendation systems.
* Summary of existing recommendation systems and their limitations.
* Detailed description of the algorithms developed (content-based filtering, collaborative filtering, SVM classification, genetic algorithms).

## Modules of E-Learning Management System:

* Data Collection Module: A script that collects daily movie ratings from a user base and metadata from TDMB.
* Data Preprocessing Module: A pipeline that removes duplicates, handles missing values and normalizes ratings.
* User Profiling Module: Profiling users into different based on their viewing history and ratings.
* Recommendation Algorithm Module: Implementing a hybrid recommender that combines content-based and collaborative filtering methods.
* Recommendation Engine Module: A service that generates and serves real-time recommendation to users.
* User Interface Module: A dashboard where users can see recommended movies, rate them and provide feedback.
* Backend Infrastructure Module: A database schema designed to store user profiles, movie metadata and interaction history efficiently.
* Scalability and Optimization Module: Implementing a microservices architecture to handle high traffic loads effectively.

### Features

* User Registration and Authentication
* User Profiles
* Personalized Recommendations
* Advanced Recommendation Algorithms
* Search Functionality
* Movie Metadata and Details
* User Ratings and Reviews
* Watchlists and Favorites
* Trending and Popular Movies
* Social Features
* User Feedback Mechanism
* Scalability and Performance
* Data Privacy and Security
* Intuitive User Interface
* Multi language Support
* Analytics and Insights
* Offline Access
* Notifications and Alerts
* Integration with Streaming Services
* Continuous Improvement

Software Requirement Specification

The Software Requirements Specification is produced at the culmination of the analysis task. The function and performance allocated to software as part of system engineering are refined by establishing a complete information description, a detailed functional and behavioral description, an indication of performance requirements and design constraints, appropriate validation criteria, and other data pertinent to requirements.

### The proposed system has the following requirements:

* System needs store information about new entry of Course
* System needs to help the internal staff to keep information of Student and find them as per various queries
* System needs to maintain quantity record
* System needs to keep the record of Faculty.
* System needs to update and delete the record
* System also needs a search area.
* It also needs a security system to prevent data.

## Identification of need

The old manual system was suffering from a series of drawbacks. Since whole of the system was to be maintained with hands the process of keeping, maintaining and retrieving the information was very tedious and lengthy. The records were never used to be

in a systematic order, there used to be lots of difficulties in associating any particular transaction with a particular context. If any information was to be found it was required to go through the different registers, documents there would never exist anything like report generation. There would always be unnecessary consumption of time while entering records and retrieving records. One more problem was that it was very difficult to find errors while entering the records. Once the records were entered it was very difficult to update these records.

The reason behind it is that there is lot of information to be maintained and have to be kept in mind while running the business. For this reason, we have provided features Present system is partially automated (computerized), actually existing system is quite laborious as one has to enter same information at three different places.

### Following points should be well considered:

* Documents and reports that must be provided by the new system: there can also be few reports, which can help management in decision-making and cost controlling, but since these reports do not get required attention, such kind of reports and information were also identified and given required attention.
* Details of the information needed for each document and report
* The required frequency and distribution for each document.
* Probable sources of information for each document and report.
* With the implementation of computerized system, the task of keeping records in an organized manner will be solved. The greatest of all is the retrieval of information, which will be at the click of the mouse. So, the proposed system helps in saving the time in different operations and making information flow easy giving valuable reports.

## Feasibility Study

This feasibility study aims to analyze the viability of developing a movie recommendation system. The system's primary objective is to provide users with personalized movie suggestions, enhancing their viewing experience. The study will cover various aspects, including technical, operational, economic, and schedule feasibility.

### A, Economical Feasibility

### Costs associated with software development, hardware procurement, and initial data acquisition.

### Salaries for developers, data scientists, and support staff.

### Expenses related to cloud services and data storage.

### Charging users a subscription fee for premium features.

### Collaborating with streaming services and movie studios for exclusive content and features.

### Enhanced user engagement, increased user satisfaction, potential for high revenue through subscriptions and advertisements.

### B. Technical Feasibility

### C. Operational Feasibility

### Movie enthusiasts, streaming service subscribers, and casual viewers.

### Movie enthusiasts, streaming service subscribers, and casual viewers.

### Regular updates to improve functionality and incorporate user feedback.

### Dedicated team for ongoing maintenance and user support.

### The system can be seamlessly integrated into existing workflows of streaming services, enhancing user experience without disrupting current operations.

## System Design of E-Learning:

In this phase, a logical system is built which fulfils the given requirements. Design phase of software development deals with transforming the client's requirements into a logically working system. Normally, design is performed in the following in the following two steps:

### Primary Design Phase:

In this phase, the system is designed at block level. The blocks are created on the basis of analysis done in the problem identification phase. Different blocks are created for different functions emphasis is put on minimizing the information flow between blocks. Thus, all activities which require more interaction are kept in one block.

### Secondary Design Phase:

In the secondary phase the detailed design of every block is performed.

The general tasks involved in the design process are the following:

1. Design various blocks for overall system processes.
2. Design smaller, compact and workable modules in each block.
3. Design various database structures.
4. Specify details of programs to achieve desired functionality
5. System reviews.

## User Interface Design

User Interface Design is concerned with the dialogue between a user and the computer. It is concerned with everything from starting the system or logging into the system to the eventually presentation of desired inputs and outputs. The overall flow of screens and messages is called a dialogue.

The following steps are various guidelines for User Interface Design:

1. The system user should always be aware of what to do next.
2. The screen should be formatted so that various types of information, instructions and messages always appear in the same general display area.
3. Message, instructions or information should be displayed long enough to allow the system user to read them.
4. Use display attributes sparingly.

## Preliminary Product Description:

The first step in the system development life cycle is the preliminary investigation to determine the feasibility of the system. The purpose of the preliminary investigation is to evaluate project requests. It is not a design study nor does it include the collection of details to describe the business system in all respect. Rather, it is the collecting of information that helps committee members to evaluate the merits of the project request and make an informed judgment about the feasibility of the proposed project.

Analysts working on the preliminary investigation should accomplish the following objectives:

* + Clarify and understand the project request
  + Determine the size of the project.
  + Assess costs and benefits of alternative approaches.
  + Determine the technical and operational feasibility of alternative approaches.
  + Report the findings to management, acceptance or rejection of the proposal with recommendations.

### Benefits to Organization

The organization will obviously be able to gain benefits such as savings in operating cost, reduction in paperwork, better utilization of human resources and more presentable image increasing goodwill.

### The Initial Cost

The initial cost of setting up the system will include the cost of hardware software (OS, add-on software, utilities) & labor (setup & maintenance). The same has to bear by the organization.

### Running Cost

Besides, the initial cost the long-term cost will include the running cost for the system including the AMC, stationary charges, cost for human resources, cost for update/renewal of various related software.

### Need for Training

The users along with the administrator need to be trained at the time of implementation of the system for smooth running of the system. The client will provide the training site.

## Project Category

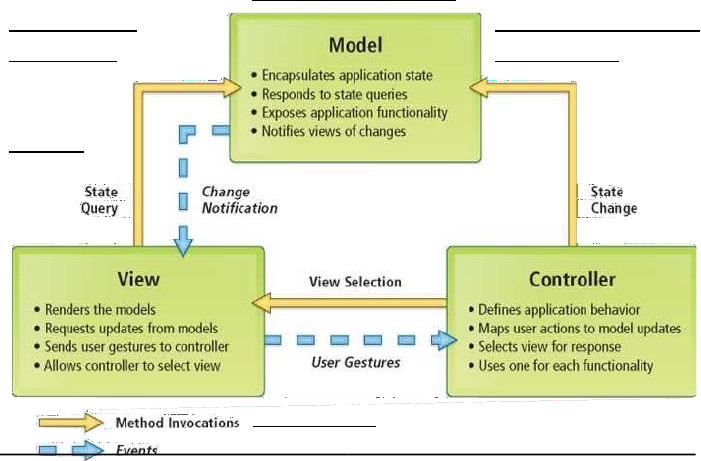
Relational Database Management System (RDBMS): This is an RDBMS based project which is currently using MySQL for all the transaction statements. MySQL is an open-source RDBMS System.

### Brief Introduction about RDBSM

A relational database management system (RDBMS) is a database management system (DBMS) that is based on the relational model as invented by E. F. Codd, of IBM's San Jose Research Laboratory. Many popular databases currently in use are based on the relational database model.

RDBMSs have become a predominant choice for the storage of information in new databases used for financial records, manufacturing and logistical information, personnel data, and much more since the 1980s. Relational databases have often replaced legacy hierarchical databases and network databases because they are easier to understand and use. However, relational databases have been challenged by object databases,

which were introduced in an attempt to address the object- relational impedance mismatch in relational database, and XML databases.



## Implementation Methodology:

Model View Controller or MVC as it is popularly called, is a software design pattern for developing web applications. A Model View Controller pattern is made up of the following three parts:

* + **Model -** The lowest level of the pattern which is responsible for maintaining data
  + **View -** This is responsible for displaying all or a portion of the data to the user.
  + **Controller -** Software Code that controls the interactions between the Model and View.

MVC is popular as it isolates the application logic from the user interface layer and supports separation of concerns. Here the Controller receives all requests for the application and then works with the Model to prepare any data needed by the View.

|  |  |
| --- | --- |
| **Name of component** | **Specification** |
| **Operating System** | Windows 98, Windows XP,  Windows7, Linux |
| **Language** | PHP, HTML, JavaScript |
| **Database** | MySQL Server |
| **Browser** | Any of Mozilla, Opera, Chrome |
| **Web Server** | Apache 2 |
| **Software Development Kit** | PHP 5.5 or above |
| **Scripting Language Enable** | JavaScript |

## Hardware Requirements :

|  |  |
| --- | --- |
| **Name of component** | **Specification** |
| **Processor** | Pentium III 630MHz |
| **RAM** | 128 MB |
| **Hard disk** | 20 GB |
| **Monitor** | 15 color monitor |
| **Keyboard** | 122 keys |

**Conclusion of the Project E-Learning Management System:**

In this project, we have made the movie recommender system which recommends movies based on the content that is the most similar to what the user searches on the site. We have used cosine similarity to find out which top 8 movies would be the closest to what the user searches. This system tries to save up the time for the users who want to watch a movie similar to watch what they had watched before. We have used movie datasets from Kaggle.com which contained information like genre, cast, movie title, keywords in the movie, language and any more to preprocess the data and filter and gather all the information that would to be required to find out all the relevant data for content-based filtering.

### At the end it is concluded that we have made effort on following points:

* + A description of the background and context of the project and its relation to work already done in the area.
  + Made statement of the aims and objectives of the project.
  + The description of Purpose, Scope, and applicability
  + We define the problem on which we are working in the project.
  + We describe the requirement specifications of the system and

the actions that can be done on these things.

* + We understand the problem domain and produce a model of the system, which describes operations that can be performed on the system.
  + We included features and operations in detail, including screen layouts.
  + We designed user interface and security issues related to system.
  + Finally, the system is implemented and tested according to

test cases.

## Future Scope of the Project:

In the proposed approach, It has considered Genres of movies but, in future we can also consider age of user as according to the age movie preferences also changes, like for example, during our childhood we like animated movies more as compared to other movies. There is a need to work on the memory requirements of the proposed approach in the future. The proposed approach has been implemented here on different movie datasets only. It can also be implemented on the Film Affinity and Netflix datasets and the performance can be computed in the future.

## Limitation of Project on E-Learning Management System

Despite the advanced features and capabilities of a movie recommendation system, there are several inherent limitations that can affect its performance and user satisfaction. These limitations include:

* + Many users may rate only a few movies, leading to sparse data matrices.
  + Difficulty in recommending movies to new users who have not rated or watched many movies.
  + Both scenarios lead to lower recommendation accuracy for new users and new movies.
  + As the number of users and movies increases, the computational resources required to generate recommendations grow significantly.
  + The system may fail to provide unexpected but relevant recommendations, focusing too narrowly on user preferences.
  + A focus on accuracy can lead to less diverse recommendations, repeatedly suggesting similar types of movies.
  + Collecting and analyzing user data raises privacy issues and requires strict compliance with regulations like GDPR and CCPA.
  + Algorithms may inadvertently incorporate biases present in the training data, leading to unfair or biased recommendations.

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