**CHAPTER TWO: LITERATURE REVIEW**

**2.0 INTRODUCTION**

Movie ranking and recommendation system is a very important system that has a lot of benefits at least to movies fan. To help set the foundation of this project.

This chapter is concerned with the study of existing solution to the topic movie ranking and recommendation system. This chapter will also contain the technologies upon which this work is based.

**2.1 THEORETICAL BACKGROUND**

The amount of films as indicated by [1] has expanded to turn out to be more congested due to the volume available; in this manner, to track down a film to watch, a client has to search through a large collection of videos and then make a choice, which is exceptionally hard to do and also time consuming. Thus, the clients need a framework that can propose the film necessity to them and the best innovation about these is the recommendation framework or system. In any case, the most used recommendation framework is utilizing collaborative filtering techniques to anticipate the necessities of the client because this strategy gives the most reliable forecast or prediction.

[2] that in the field of machine learning there are six possible way of classifying data for recommendation, they are:

1. Collaborative filtering
2. Content-based filtering
3. Multi-criteria recommender systems
4. Risk-aware recommender systems
5. Mobile recommender systems and
6. Hybrid recommender systems

It is my desire to use the collaborative filtering and content-based filtering as a framework for designing my system.

**2.1.1 TECHNOLOGY USED**

* **HTML:** This is an acronym for Hypertext Markup Language. It is a markup language used to describe the structure of a web page. HTML markup tags are usually called HTML tags. They are keywords surrounded by angle brackets like <br>. they normally come in pairs like <p> and </p>. The first tag is the start tag and the second one is the ending tag. Each Html tag defines the format of how its content has to be structured. E.g. the <p> defines that it’s content be rendered by the browser as a paragraph, etc.
* **CSS:** This stands for Cascading Style sheet. It is used to describe the presentation semantics (look and formatting) of a document written in a markup language like HTML. A CSS rule consists of a selector and a declaration block. In CSS, *selectors* are used in describing which part of the HTML a style applies to by matching tags and attributes in the HTML itself. The following rule has a selector p that refers to a p tag element which specifies how to style the element: “use color green, center the text”.
  + p{
    - color: green;
    - text-align: center;
  + }
* **JAVASCRIPT:** often abbreviated as JS, is a high-level, interpreted programming language that conforms to the ECMAScript specification. It is a programming language that is characterized as dynamic, weakly typed, prototype-based and multi-paradigm.
* **PHP:** This is an acronym for Hypertext preprocessor. It is a general-purpose server-side scripting language originally designed for web development to produce dynamic web pages.
* **Frameworks:** frameworks like bootstrap, JQuery and others were also used.
* **MySQL:** This is the simplest type of SQL language. SQL means Structural Query Language. It is used for the collection and manipulation of data (storing, retrieval and manipulation of data in the database).

**2.2 REVIEW OF RELATED LITERATURE**

This sub-chapter focuses on the review of previously published works on movie ranking and recommendation system, with the aim of establishing the progress different entities have made in the subject matter.

According to [2,] recommender systems typically use either collaborative filtering or content-based filtering (also known as the personality-based approach), as well as other systems such as knowledge-based systems. [2] also stated that a movie recommendation system is extremely important in our social lives because of its ability to provide enhanced entertainment. A system like this can recommend a set of movies to users based on their interests or the popularity of the movies. [2] likewise noticed that Recommender frameworks are used in an assortment of regions and are most ordinarily perceived as playlist generators for video and music administrations like Netflix, YouTube and Spotify, item recommenders for administrations like Amazon, or content recommenders for online media stages like Facebook and Twitter.

For the advancement of the film suggestion framework [2] used the film focal point little dataset, and spotlight on two records, i.e. the movies.csv and rating.csv. here the movie.csv had three fields in particular:

1. Movie id – it has a unique id for every movie
2. Title – it is the name of the movie
3. Genre – the genre of the movie.

While the rating.csv file contained four fields namely:

1. User id
2. Movie id
3. Rating
4. Timestamp.

Conclusively the framework presented Movie Rec, a recommender framework for film suggestion which permitted clients to choose his/her decisions from a given arrangement of characteristics and afterward suggest a film list dependent on the aggregate load of various qualities utilizing K-implies calculation. The significant impediment of this framework is that it was only a model that was rarely executed.

[3] additionally had a similar view with [2] concerning the significant of suggestion or recommendation framework in this advanced period. This paper groups collaborative filtering utilizing different methodologies like network factorization, client based suggestion, item based recommendation. The work carried out by [3] was chiefly an examination work on the different sort of calculation that can be utilized to carry out suggestion or recommendation framework. First [3] portrayed how a cooperative separating can be accomplished utilizing the KNN model. As per [3] the KNN model aides separate the film informational collection into an unrated and evaluated test set, which would then be prescribed to the clients depending on the data accumulated from their enrollment data and as per the film history and score of the user. The database in this methodology is the MYSQL information base. While in the Alternating Least Squares(ALS) calculation [3] noticed that the outcome got utilizing this technique is better contrasted with utilizing different calculations like SVD, KNN, and the typical indicator. Be that as it may, in utilizing this methodology the calculation must be prepared with a great deal of dataset. The significant constraint of this framework is that the framework isn't productive in prescribing motion pictures (i.e. movies) effectively to existing clients as compared to new clients.

[4] created and deployed a movie recommendation system based on the KNN collaborative filtering algorithm. According to [4,] the KNN algorithm is known as the K nearest neighbor classification algorithm. The way the system works is that if the majority of the K most similar neighbors of samples in the feature set belong to a particular category, then the sample is considered to belong to that category as well. Figure 1 depicts this. The majority of w's nearest neighbors are in the x category, and w is in the X category.

Fig. 1. Example of KNN algorithm

[4] also said that collaborative filtering algorithm is categorized as user-based collaborative filtering algorithm and project-based collaborative filtering algorithm. The basic idea of the collaborative filtering recommendation algorithm is to introduce the information of similar-interest users to object users. As show in figure 2.



User A enjoys movies A, B, and C, and user C enjoys movies B and D, so we can conclude that user A and user C have very similar tastes. Because user A enjoys movie D, we can infer that user A may also enjoy item D, and thus item D would be recommended to the user. The algorithm's basic concept is based on the user's history score. Find the neighbor user as u' who shares the same interests as target user u, and then recommend the items that the neighbor user u' liked to target user u; the predict score that target user u may give on the item is obtained by the score calculation of neighbor user u' on the item. The algorithm consists of three basic steps: user similarity calculation, nearest neighbor selection and prediction score calculation.

The above framework depended on B/S mode, it utilizes JavaEE design, and Tomcat server for framework arrangement. The undertaking was an online task and utilized html, css, JavaScript and for the backend it utilized Struts2, Spring and rest, the data set uses MySQL for capacity. The framework is object-arranged. Taking everything into account, the article planned and carried out a total film suggestion framework model dependent on KNN.

[5] proposed a mathematical model in developing a recommendation system for movies. The model had the ability to estimate distributions from tied and incomplete data from collaborative filtering. The pros of his model is that it proffered a solution to some of the weakness observed in the KNN algorithm, such as the inability of the algorithm to proffer solution when there is incomplete data. While the cons of the work is that it just a theory and has to implemented first to ascertain that it really meet up with it expectations.

According to [6] a recommender system recommends objects of interests based on user’s implicitly specified choice or behavior. [6] noted that most of the recommendation systems sort out information through two means, namely

1. Collaborative and
2. Content based filtering

Where collaborative filtering recommends items built around a user behavior while content based or cognitive filtering recommends item based on its characteristics, this is done by studying user profiles. In other to actualize this study, an online questionnaire was designed and sent to 400 Indian video OTT consumers and 366 responses were received. These responses gathered was used to identify perception and evaluation of video recommendation systems. Stratified sampling procedures was used for the selection of respondents for the study. From the study carried out the researcher came to the conclusion that consumers decide to use recommendation system to choose content to view primarily because of the trust, confidence and satisfaction he/she has from the system. Conclusively, [6] work was a research work that was set out to understand user-centric perspectives towards recommendation systems in Indian video services.

The pros of the research are; the research gives the developers of recommendation systems an overview of what it consumers want, how it consumers sees the available systems and what are there expectation. While the con of this research is that the conclusions arrived at can hardly be used for other populations, given the fact that the research was focused on just Indians.

From the review of various relevant literature above, it can be concluded that a recommendation system is of utmost importance in this era and that there are many algorithms that can be used to achieve this system. Hence it is my desire to develop a movie recommendation and ranking system using a suitable algorithm that will be able to serve a large audience.

# References

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| [1] | P. Vilakone, D.-S. Park, K. Xinchang and F. Hao., "An efficient movie recommendation algorithm based on improved k-clique.," *Human-centric Computing and Information Sciences,* vol. 8 , no. 1, pp. 1-15., 2018. |
| [2] | P. Kumar, S. G. Kibriya and Y. Ajay., "Movie Recommender System Using Machine Learning Algorithms," *In Journal of Physics: Conference Series,* vol. 1916, no. 1, pp. 012 - 052, 2021. |
| [3] | N. a. V. K. Raval, "A review paper on Collaborative filtering based movie recommendation system.," ISSN Explore , 2019. |
| [4] | B.-B. Cui, "Design and implementation of movie recommendation system based on Knn collaborative filtering algorithm.," *In ITM web of conferences,* vol. 12, p. 04008, 2017. |
| [5] | M. Sun, Guy Lebanon and P. Kidwell., "Estimating probabilities in recommendation systems.," *In Proceedings of the fourteenth international conference on artificial intelligence and statistics, Workshop and Conference Proceedings,* pp. 734-742., 2011. |
| [6] | S. a. K. S. Sivamol, "Personalization Phenom: User-centric Perspectives towards Recommendation Systems in Indian Video Services.," *SCMS Journal of Indian Management ,* vol. 16, no. 2, pp. 73-86, 2019. |