INRODUCTION

A recommendation system refers to a system that is able to predict the future preference of a set of elements for a user and recommend the main elements. A key reason we need a recommendation system in a modern society is that people have too many options to use due to the prevalence of the Internet. In the past, living a physical store, where available items are limited. For example, the amount of movies that can be placed in a Blockbuster store depends on the size of that store. On the contrary, today, the Internet allows people to access abundant resources online. Netflix, for example, has a huge collection of movies. Although the amount of information available increased, a new problem arose as people had difficulty selecting the items they really want to see. This is where the recommendation system comes into play.Many products are purchased online, and there is a growing demand from customers to filter many items available on websites, so that, a specific item can be founded more easily according to their real interest.

**NEED OF RECOMMENDATION SYSTEM**

Companies that use recommendation systems focus on increasing sales as a result of highly customized offers and a better customer experience. In general, recommendations speed up searches, and make it easier for users to access the content they are interested in, and surprise them with offers they never wanted. In addition, companies can win and retain customers by sending emails with links to new offers that meet the interests of the recipients, or suggestions of movies and TV shows that fit their profiles. The user begins to feel known and understood and is more likely to buy additional products or consume more content. By knowing what a user wants, the company obtains a competitive advantage and decreases the threat of losing a customer to a competitor. Providing that added value to users by including recommendations in systems and products is  attractive. In addition, it allows companies to position themselves ahead of their competitors and, finally, increase their profits.

**Overview Of Recommendation System –Working**

There are mainly two types of information Recommedation system uses

1. User and Item based – This information include rating,likes on post,purchase count by user.

The relation between user and item is explored using this information.

User’s preference can evaluate using the number of likes , purchase count , time of watch ,etc

1. Characteristic based – This information is all about user and Items. Items are always associated with some keywords ,Category. Information includes Users - their profile along with the preference

Based on above criteria, we can distinguish RS between three algorithms used in recommender systems:

1. Content-based systems
2. Collaborative filtering systems
3. Demographic systems
4. Content-based System

This model uses the user data profile to find matching items related to the item list, but new products and present this new item to the user. A recommended list of potentially interesting items. The correspondence is made by calculating the similarity of the cosine between the prototypes vector and the element vector

These systems make recommendations using a user element and profile features. They hypothesize that if a user was interested in an article in the past, they will be interested in it again in the future. Similar elements are usually grouped according to their characteristics. A user profiles are constructed using historical interactions or by explicitly asking users about their interests. There are other systems, not considered purely based on the content that use personal and social data of the user. A problem that arises is making obvious recommendations due to excessive specialization (user A is only interested in categories B, C and D, and the system cannot recommend items outside those categories, although they may be interesting for them). Another common problem is that new users lack a defined profile unless explicitly requested information. However, it is relatively simple to add new elements to the system. We just need to make sure to assign them a group according to their characteristics.

1. Collaborative filtering systems

Collaborative filtering is currently one of the most used approaches, and generally provides better results than content-based recommendations. \*Some examples of these are found in the recommendation systems of YouTube, Netflix and Spotify. These types of systems use user interactions to filter items of interest. We can visualize the set of interactions with an array, where each entry (i, j) (i, j) represents the interaction between user ii and the element jj. An interesting way to see collaborative filtering is to consider it as a generalization of classification and regression. Although in these cases we intend to predict a variable that depends directly on other variables (characteristics), in the collaborative filtering there is no such distinction between the characteristic variables, and the class variables. Visualizing the problem as an array, we do not seek to predict the values ​​of a single column, but rather to predict the value of any given input..

In summary, collaborative filtering systems are based on the assumption if one user likes item A and another user likes the same item A, as well as another item, item B, the first user might also be interested In the second element. Therefore, its objective is to predict new interactions based on the historical ones. There are two types of method to achieve this goal: based on memory and model.

**Memory-based**

There are two approaches: the first identifies user groups and uses the interactions of a specific user to predict the interactions of other similar users. The second approach identifies groups of elements that have been rated by user A and uses them to predict the interaction of user A with a different but similar element B. These methods generally encounter significant problems with large dispersed matrices, since the number of user elements Interactions may be too low to generate high quality clusters.

#### Model-based

These methods are based on machine learning techniques and data mining. The goal is to train models to be able to make predictions. For example, we could use existing interactions between users and elements to train a model to predict the 5 main elements that a user likes most. An advantage of these methods is that they can recommend a larger number of items to a larger number of users, compared to other methods such as those based on memory. We say they have great coverage, even when they work with large dispersed matrices.

**The Collaborative System has two main Challenges**

1. **COLD START :** We should have enough information (interactions between users and elements) for the system to work. If we set up a new e-commerce site, we cannot give recommendations until users have interacted with a significant number of articles.
2. Adding new users/items to the system: whether it is a new user or item, we have no prior information about them since they don’t have existing interactions.
3. **Demographic System**

This recommendation system technique used user profile information such as age, gender, demographic area, education, interests and their opinion on the qualification elements and found that common users have similarity.

**SYSTEM REQUIREMENTS**

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**Problem Staatement**

**This work is to focus on the development of the issues in Recommendation System**

**Mainly Cold Start and Grey ship and to develop hybrid system which can improve the Recommendation System**

1. **To study the Existing Recommendation Systems**

**Literature survey**