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MOTIVATIONAL CONTENT BASED RECOMMENDATION SYSTEM FOR SOCIAL MEDIA

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Abstract : Social media is becoming a necessity in today's era. It is essential to our daily lives. Nobody is able to escape its influence. . People spend 70% of their time on social media watching movies, chatting, conversation, online gaming. It's always been interesting to know the impact of it over the young generation of India. The increasing popularity of social media resources such as blogs, bookmarks, chat rooms, forums and video portals in recent years has attracted diverse users. The increasing popularity of the Internet has resulted in an abundance of online content, which prompted the development of recommendation systems on social media. As a result, since the year 2000, there has been a considerable increase in study on the dynamic growth of recommendation systems in social media. In order to find the most relevant recommendations, social media recommendation systems (SMRS) use a variety of recommendation fields, including item, user, location, tag, event, tour, and game. The purpose of this research paper is to show motivational based recommendations to youth on social media. This paper proposes a sentiment-based recommendation system that aims to analyze the psychological patterns of social media users and provide personalized recommendations based on their sentiments. The system collects data from users' social media profiles, such as their posts and comments, and uses natural language processing techniques to analyze the sentiment expressed in their messages. Based on the sentiment analysis results, the system recommends content that is relevant and appealing to the users. The proposed system can help users to discover new content and interact with like-minded individuals, thus enhancing their social media experience. The paper concludes by discussing the potential applications of the system and highlighting future research directions.

Keywords : Recommender system, Social media , Hybrid Filtering , Motivational based , Social recommender system , Sentiment Analysis , Text Mining , K-Means .

I.INTRODUCTION

Nowadays, a large amount of information (including data, images, videos, contents, and documents) is shared on social media. This considerable sharing of information introduces the problem of information overload to users. Because of this, a number of social media platforms use recommender systems (RSs) to address this problem and provide targeted consumers with relevant information. RSs have been extensively explored in the mid-1990s.RSs work to make suggestions for products, television shows, movies, music, and novels. RSs analyse suggestions from users in the form of reviews and ratings. In the academic context, the recommendation systems (RSs) of scientific and online libraries serve users by enabling them to go beyond catalogue searches using the systems' effective and precise recommendation methodologies, resulting in recommendations that are relevant and reliable. RSs can reduce the time and cost spent by users and improve the process, quality, and decision-making strategy for providers.

Social media RSs produce helpful recommendations of articles and products that assist users in working with one another. Social networks (Facebook, Twitter, and blogs) contain a large quantity of information available as online documents and archives. Social networks aim to allow connection among friends and contain valuable information about user preferences. However, contents shared on these networks are noisy and heterogeneous, and they must be processed for information extraction. Users discuss their specialization and highlight their opinions online. The number of online items is rapidly growing. Thus, determining items in a particular specialization becomes difficult for experts. RS is an essential solution to this problem and used in social media sites to identify the neighbors of target users based on user profile. These systems suggest the target user items liked or posted by neighbor users. Identifying the suitable item or information on the internet becomes challenging due to information overload. By filtering primary data in accordance with user preferences, interests, liked items, and ratings on the desired item, RS is an information filtering system that addresses this issue. These factors predict whether the user will prefer the information according to his or her profile. Social media grows at a high rate as a result of the popularity and large number of users in the network.

The process of data mining involves utilizing analytical techniques to explore data, seeking out relationships between variables and applying the resulting insights to a new subset of data. Stored within a data warehouse, the type and amount of data available

can vary greatly depending on the specific company. While the term "data mining" may be new, the technology itself is not. It's important to distinguish between data and knowledge; data refers to facts, numbers, and figures that can be processed by a computer and may come from sources such as banks, insurance companies, hospitals, or government agencies. By identifying patterns and relationships among this data, information can be gleaned, which can then be turned into knowledge for understanding both historical data and future trends.

II. LITERATURE SURVEY

The three approaches that were generally used to create the RSs are content-based (CB), collaborative (CF), hybrid-based (HB), CB filtering uses features and preferences to provide suggestions. Instead of user data, content similarity is used. Similar users are considered active users by CF. This system is based on the opinions and previously declared interests of people who share your interests. The most known method that overcomes the shortcomings of CB and CF is HB filtering, which combine CB and CF techniques .The explicit knowledge of an item assortment, user preferences, and recommendation criteria form the basis of motivational content based filtering.

Several data mining techniques, like k-means and k-nearest neighbour (k NN) are used in social media RSs to extract user trends or interests from enormous amounts of data .These methods are applied in social media RSs to draw conclusions from data and offer helpful advice. In general, two methods or two dimensional and contextual or multidimensional—are used in RSs in social media to offer helpful recommendations based on ratings or rankings.

Recommendation categories like item-user (relevance between pair of item and user), user-item (relevance between pair of user and item), user-tag (relevance between pair of user and tag), and user-user are typically included in classical techniques (relevance between a pair of user and user).

In order to make relevant recommendations, contextual or multidimensional approaches, like user-tag-items or user-item-tag, require more than two dimensions. The performance of RS approaches is assessed using a variety of performance indicators, including precision, recall, and accuracy. The effectiveness of the chosen pertinent things is measured by precision. Recall is the sum of the number of pertinent things chosen and the number of items in the entire set. The reproducibility of user ratings is measured by accuracy. Many reviews and surveys on RS have been published in social media over the last few years. These research focused on the classic methodologies, such as CB, CF, and HB, and gave an overview of the technologies that are currently available for creating personalised RSs and recommendation approaches.

Additionally, from the standpoint of recommendation methodologies and types, these published reviews primarily reviewed the prior research in the field of social media RS. By focusing on RS according to six aspects, this evaluation differs from others that have already been published. The six areas of social media RSs that this study will explore and assess are: (1) recommendation approaches; (2) social media subdomains; (3) datasets; (4) data mining techniques; (5) recommendation types; and (6) performance measures. Following is a list of the review's particular contributions:

In-depth information about social media, its subdomains, and the function of RSs in social media is provided in this review.

Different social media subdomains are reviewed. The goal of RSs in these subdomains is to give users helpful recommendations. A number of datasets that are currently being utilised and are openly accessible for future researchers are cited and reviewed for each subdomain.

In-depth reviews of a number of data mining techniques used to ascertain users' preferences or interests related to items or other users are provided.

Various recommendation kinds, including classical and contextual recommendations, that were employed in a few research were thoroughly studied and reviewed. Also identified and reviewed are the popular performance metrics used to evaluate RS performance.

Finally, social media RSs are still in the early stages of development, and many unresolved difficulties demand more research. In order to enhance social media recommendation's performance across various social media domains, this study offers prospective research approaches.

A. EXISTING RECOMMENDATION SYSTEM

Hybrid Filtering, Collaborative Filtering, and Content based filtering are the most used recommendation types in sequence. Various types of recommendation filtering shows different advantages and disadvantages. Content based filtering makes recommendations similar to items previously preferred by a specific user. These items are used to distinguish the items used in user profiles. To compare each item with the user profile, items with a high degree of similarity with the user profile will be recommended. Collaborative filtering is used to select based on the opinion of other people who share similar interests. Collaborative filtering can be classified into user based and item-based approaches. In a user-based approach, a user will receive an item recommendation liked by similar currently active users. In an item-based approach, the user will receive recommendations of items by those who liked the item in the past. A prediction for the active user is calculated by a weighted average of the ratings of the selected users. The important issue with collaborative filtering is sparsity having only few ratings is a considerably severe problem. Hybrid filtering achieves high performance and overcomes the drawbacks of Content based and Collaborative. To overcome the existing issues on Content based and Collaborative Filtering, Hybrid Filtering approach is used in common practice to avoid cold start, sparseness, and/or scalability problems and obtain improved performance. Hybrid filtering is mostly custom-based development. Different social media recommendation types and strategies are combined and exploited under Hybrid based to improve the performance of recommendations when individual techniques do not provide satisfying results. Several studies showed that the Hybrid based approach achieves good performance in RS by combining the advantages of Content based and Collaborative approaches.

B. LIMITATIONS OF EXISTING RECOMMENDATION SYSTEM

Recommends the same content for all age groups , content would be Movies , Images , Videos and text format.
Recommend content which spreads jealousy and hatred

III. METHODOLOGY

The steps of the research methodology are summarized as follows.
i. Classification and study of research papers on social media RSs.
ii. Analysis of research papers on social media RSs and summarize the recommendation system for motivational content based recommendation systems.
iii. Analysis of importance of social media RSs and improvements.
iv. Machine learning Algorithms based on content based, collaborative based, hybrid-based.

PROPOSED RECOMMENDATION SYSTEM

The most efficient method for reducing information overload is the recommendation system, which has attracted a lot of interest in recent academic and professional circles. In this essay, a hybrid recommendation approach based on inspiring content is suggested. In order to create a hybrid recommendation system based on the analysis of user behaviour preferences, the post-based collaborative filtering recommendation view and the content-based recommendation view are combined. This recommendation system focuses on the emotional mining and deep semantic analysis of text information, as well as the mining of the natural language description information of the post content.

I. CONTENT BASED FILTERING

Content filtering aims to categorize content with specific keywords, discover the user's preferences, look up those terms in the database, and then suggest related items.
Users' inputs are extremely important to this kind of recommender system; common examples include Google, Wikipedia, etc. For instance, when a user types in a set of keywords, Google shows all the results that contain those words.

Two different models and algorithms are used in the two techniques by which the content-based recommendation system operates. Method 1 and Method 2 both use a classification model, while Method 1 uses the vector spacing method.
A content-based recommender uses information that the user supplies, either consciously (ratings) or unconsciously (other actions) (clicking on a link). This information is utilised to create a user profile, which is subsequently used to provide suggestions to the user. When the user provides more data or follows the advice, the engine becomes more accurate. The engine gets more accurate when the user adds additional information or acts on the recommendations. The ideas of Term Frequency (TF) and Inverse Document Frequency (IDF) are applied to content-based filtering techniques as well as information retrieval (such as a content based recommender). They are employed to assess the relative significance of a piece of writing, an article, a news story, a film, etc.

II. COLLABORATIVE BASED FILTERING

Two general categories can be used to classify CF techniques:
a) Memory-based approach: User-user filtering and item-item filtering are the two main categories under which Memory-Based Collaborative Filtering techniques fall.
1. User-to-user filtering: In this type, products that another user B liked are suggested to user A if their attributes are similar. The phrase "the users who like products similar to you also liked those products" can be used as a claim. So in this case, we advise making use of two users' shared characteristics.
2. Item-item filtering: In this case, if user A likes an item x, then the user is suggested to buy things y and z that are similar to x in property.
"Because you liked this, you might also like those," is one example of a possible statement.

The proposed system consists of following stages:

- Pre-processing data
- Classification into positive , negative and neutral
- Providing recommendations according to the class and intensity of post

b) Model based approach

Model based approaches assume an underlying “generative” model that explains the user-item interactions and try to discover it in order to make new predictions.

Suppose we have a dataset and in this dataset to pre-processing the data then the pre-processing is being done to make the data still more efficient for the classification. Pre-processing or data clean-up is very much necessary in order to avoid the overloading and storage problem, Since the dataset consists of a lot of information, and hence before processing the unnecessary values and other symbols which are not at all required for classification purposes are removed. So the dataset consists of a lot of information, unwanted information for classification is being removed. This includes:

- Removal of Stop words
- Punctuations & symbols Removal

- Removal of numerical values

K-means Clustering

An approach that is frequently used to automatically divide a data set into k groups is called K-means clustering (Mac Queen, 1967). It is an algorithm for unsupervised learning.K-means seeks to minimise the sum of the squared distances between each point and the centroid of the corresponding cluster. K-means clustering attempts to divide a set of observations (x1, x2,..., xn) into k (? n) minimises the within-cluster sum of squares by setting S = S1, S2,..., Sk, where i is the mean of the points in Si. Each observation is a real vector in d dimensions.

• It is NP-hard to find the global optimum.
• The k-means algorithm will always reach a local optimum.

Suppose we have consider the data then,

Firstly, we have to select the numbers of clusters which we want for our dataset. Later, an elbow method will be explained for selection of the optimal number of clusters.
The following step is to choose k unnecessary centroid locations at random from our dataset.

To avoid random initialization traps which can stick to bad clusters, we'll use k-means++ to initialize k centroids and it is provided by Scikit-Learn in the k-means algorithm.
The K-means algorithm will assign each data point to its closest centroid which will finally give us k clusters.
The centroid will be re-centre to a position which is now actually the centroid of its own cluster and will be a new centroid.
Each dataset point will once more be assigned to the new nearest centroid after all clusters have been reset. If the new clusters are the same as the previous cluster or total iterations have completed then it will stop and give us the final clusters of our dataset. If not, step 4 will be reached once more.

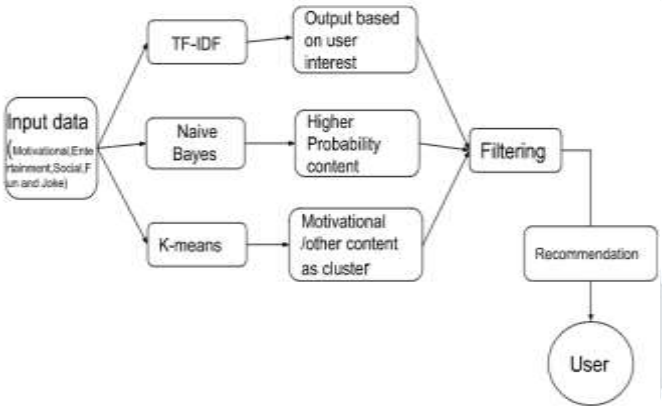

fig. Proposed Recommendation System

Keyword Filtering

- We apply keyword filtering for motivational based content, which filters the content in the dataset.
- We allow the content which is motivational, educational and recommend this content to users.
- We put restrictions on the fun content, Entertainment based content which is only for the timepass.

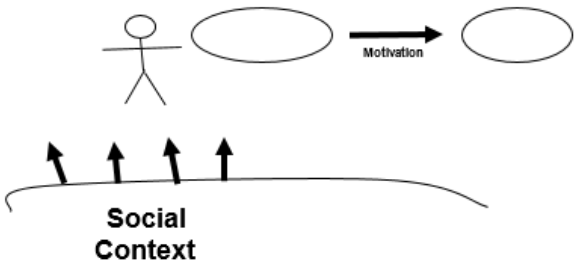

fig. Utilizing social environment to enhance motivation for goal achievement

IV. RESULT

In our project we had implemented both content-based and collaborative-based filtering, which makes our system a hybrid system. By implementing both in a single system we had overcome drawbacks from both types of filtering techniques. The recommendations system requires a very large amount of data to work efficiently, which is lacking for many small scale commercial websites. But our system does overcome this problem too, as it works efficiently when provided with a small amount of data which is a boon for small scale commercial websites. The advantage of this recommendation system is it analyzes all the data provided by the user in their user profile and then it recommends motivational content only.

V. FUTURE SCOPE

The proposed system can be enhanced by incorporating more advanced techniques in sentiment analysis, such as emotion detection, to further improve the accuracy of the system. The system can be extended to include multimedia data such as images and videos, in addition to textual data, to provide more personalized recommendations to users. The proposed system can be evaluated and compared with other existing recommendation systems to determine its effectiveness and identify areas for further improvement.

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