

Social Networking With Smart Education

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Abstract - In today's age of ever increasing use of internet, there are around 74% active internet users out of which 60% users contribute to social networking and most of them are students from the age group 16-30. If this young generation is targeted specifically towards educational activities keeping the same social networking environment in the background would create interest in students for educational activities and also yield productive results. Using Big Data analytics, machine learning and recommender system on the student data and activity would provide them with useful information and suggestions which would help them gain knowledge and make proper decisions to make their future in right direction. This can be implemented by creating a social-cum-educational portal with recommender systems; also data can be generated and displayed on the same place after analysis through recommenders. There is large amount of social, educational information generated on a rapid basis on the web which can be analyzed and used for the betterment of the students and also the analyzed information can be provided to the students based on their interests. Specific information to specific student can be provided. Use of such technology can reduce the gap between students and the information which can lead to their inherent development and success!

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I. INTRODUCTION

Global social media research summary 2018 states that the number of social media users worldwide in 2018 is 3.196 billion, which increases 13 percent year-on-year. Most of them are students from the age group 16-30. The leading social networks are usually available in multiple languages and enable users to connect with friends or people across geographical, political or economic borders. Approximately 2 billion internet users are using social networks and these figures are still expected to grow. The primary activity by youngsters on the web is social networking. Facebook, Tweeter, LinkedIn and the names would go on increasing when talking about social networking. There are about millions of users active daily on these sites and they generate a large amount of data such as blogs, photos, videos and user generated content. Social networking affects one's life differently either in a positive or a negative way, moreover it is the negative way. Due to a constant presence in the lives of their users, social networks have a decidedly strong social impact. The abundance and popularity of these systems have led to the flooding of huge amount of data and hence brings the users the problem of information overload.

One of the solutions to this problem is turning this social networking in a smart education system by keeping the social networking features in the background. This can be achieved by creating a social-cum-educational portal and using recommender system for them by using their social-cum educational profile for fetching them user-specific and useful information from the web which can be in a number of forms. This can be done by using the profile and activity data from the social and educational portals of the students to provide future predictions to the existing students based on their profile and activity data and also recommend them to take the right actions at that moment to get in the success direction. The power of Big Data analytics, machine learning, collaborative filtering techniques, content-based filtering techniques, etc. can lead to obtain undiscovered insights from the student data which can be made functional for the wellbeing of the students. A web portal which provides educational information as well as a social networking platform can be created for students.

II. SOCIAL NETWORKS HOMOGENIZED WITH EDUCATION

While much of the curriculum takes place in a physical space which we describe as smart student

education, it does include some activities such as interacting socially with people of same interests. Smart education system with analysis is a sophisticated technology environment that can assign roles, deliver materials, and support student activities within the learning space. In this system we connect the profiles socially with same area of interest or people working on same project in the university. This can connect them and help them discuss or work on the project simultaneously. Teachers' interaction will also play an important role where we can have relationships of profiles formed according to the subjects. This representation would allow students to situate their individual contributions within a complex interrelated web of content, providing them with the ability to construct personal understanding in relation with more global knowledge construction and activities conducted by the institute.

III. DATA ANALYTICS

Data analytics is a process of studying the unprocessed data with the view of resulting conclusions of a particular information. Data analysis is used in many organizations for the betterment of business decisions, in the life of science to verify or disapprove systems or theories. It is used more in the business sector for the analysis of profitable functioning of the company. Data analysis has drawn great importance for the telecom companies which need precise data to handle large amount of customer services. It is also playing an important role in the educational analysis such that the students would get recommendations and suggestions based on their field of interest. It's very rare that we have some platform which would analyse the activities and areas of interest of students and create a huge amount of benefit in their education. In this system implementation the students gain knowledge when they make connections. Data analysis is a process of connection discovery. The more data the greater we have possibilities and the greater we need to filter it for efficient output. It helps us to contextualize the future predictions and recommendations of a student.

IV. RECOMMENDERS AND MACHINE LEARNING

Recommendation system provides us the facility of understanding a person's taste and find desirable content for them automatically. Although people's tastes vary, they do follow certain patterns. People tend to like things that are similar to other things they like as well as other similar behavioural person likes. Sometimes these types of patterns can be related with the relevant processing of items. On the other hand, we could figure out what items are similar to what we already liked, again by looking to other's apparent preferences. In fact, these are the two broadcast categories of recommender engine algorithms: user-based and item-based recommender systems. These recommendations are based on two filtering techniques namely collaborative and content-based filtering techniques.

A genetic algorithm which can actually be used to learn the interests of a user from a set of documents the user has rated. The interests of the users which are represented by a profile vector in the vector space model and learned from various population of potential profiles. The fitness of a potential profile known as P is determined by using various functions. Taking a feedback of students by asking their interest would be easier for the recommendation system and suggestion system to post the same on their profiles. This technique will be applied in the Smart student education system too which will analyse and give suggestions/recommendations according to the area of interest given by the user. Here the users are able to find articles, blogs, e-books, videos, links and much more with their interest sector. The user interests will be secured and stored for further future analysis as a repository.

Prediction for user interests will also be a generalized term in the recommendation system. Multiple users having the same database with similar area of interests will be an add-on suggestion in the social network of the system. First the mapreduce functions will execute on the user profiles which will contain data, this data will be further stored into the HDFS and then be retrieved on the other user profiles based on the user's activity. This is also known as the activity based recommendation or collaborative filtering. Item-based collaborative filtering analysis uses a particular user profile and the references such as links the user profile has accessed. These links or references will be further posted to a new user of the same area of interest.

V. INTRODUCTION TO RECOMMENDATION ALGORITHMS

1. Friend recommendation

We have implemented this feature using our own algorithm. The algorithm is based on a scoring system. We consider a user A, to whom we want to recommend friends. The user A is paired with all the users in the system and a score is assigned to each user based on the similarities among them. So, the users with the maximum score, say top 5 maximum score users are recommended to the user A.

Working of the Algorithm:

- We need to find friend recommendations for user A. So, we pair up each user in the system with user A.
- If suppose we first pair up user A and user B, we now need to assign a score for user B.

- The points are assigned for 2 categories.
- If user A and user B belong to the same college then 4 points are assigned.
- If user A and user B have similar course selection, then 2 points for each similar course.

In this way total points are counted and the top 5 users with maximum points will be recommended to the user A.

2. Course Recommendation

We have implemented this feature using our own algorithm. The algorithm is based on global likes. So, the course with the most likes will be on top of the list of recommended items in the user's domain. So, if user A has chosen domain 1 and 2. So he will get recommendations of courses from both the domains but the most liked ones only, say top 10 most liked. Also, if he likes a course outside his domain say 3, he will then get top most liked courses from that domain as well.

Working of the Algorithm:

- We need to find course recommendations for user A. So, when registering the user selects some domains. So, at the start, he gets recommendations according to those domains which have maximum likes.
- Later, when he likes a course which isn't from his domain, he then gets recommendations from those domains as well

Some features of the portal

a. Similar Users Recommendation

User profile document often includes user demographic information, personal interests, education backgrounds, work experiences, etc. If two user profile documents are very similar, then they also have the high similarity and can be recommended to each other to become friends. Accordingly, we need to compute pair wise similarities of user profile documents. If two users have high similarity of corresponding user profile documents, then they can be recommended to each other.

b. Content Recommendation

In social networks user-generated content often follows lots of user evaluations, such as ratings. Therefore, collaborative filtering technique, which is widely used in recommender system, can be utilized to recommend user-generated content to users. Collaborative filtering technique has two main categories: user-based methods and item-based methods. User generated content can also be regarded as the item.

Also, miscellaneous features such as connecting to friends, posting on their walls, viewing the posts that are all basic social recommendation system features.

VI. RECOMMENDATION SYSTEM:

Recommendation system provides us the facility of understanding a person's taste and find desirable content for them automatically. Although people's tastes vary, they do follow certain patterns. People tend to like things that are similar to other things they like as well as other similar behavioural person likes. Sometimes these types of patterns can be related with the relevant processing of items. On the other hand, we could figure out what items are similar to what we already liked, again by looking to other's apparent preferences. In fact, these are the two broadcast categories of recommender engine algorithms: user-based and item-based recommender systems. These recommendations are based on two filtering techniques namely collaborative and content-based filtering techniques.

a. Collaborative filtering

Collaborative filtering is a methodology of predicting the taste of an individual user by finding the similarity between past data of all users and the data of the current user. Collaborative filtering practices to obtain the best recommendations possible. Collaborative filtering approaches build a model from a user's past behaviour as well as similar decisions made by other profiles; then use that model to predict that the user may be interested in. Content-based filtering approaches and results in utilizing a series of discrete characteristics of an item in order to recommend other additional items with similar aspects.

b. Content-based filtering

Content-based filtering is another approach for recommender system. These methods are based on description of the item and user preferences. The keywords are used to describe the item to indicate their characteristics that can be used for generating recommendations. In other words, these algorithms try to recommend each kind of items which are almost and most likely similar to those that a user or a profile liked in

the before past (or is examining in the present). In particular, various candidate items are closely compared with items previously which was rated by the user and the best-matching items are recommended.

Data obtained in the following situations is ambiguous and should be refined properly:

- i. Sarcastic reviews,
- ii. Spam reviews,
- iii. Review that may not express any meaning,
- iv. Regional and SMS type's language,
- v. Internet slang words and emoticons,
- vi. Conditional sentences,
- vii. Positive and negative reviews.

c. Hybrid filtering

Hybrid filtering approach can be implemented in two ways. One is both content based and collaborative filtering are applied separately and then combine the result as per need. Second, first we apply collaborative filtering and then apply content based filtering on the result.

VII.LITERATURE SURVEY

The main aspect of the paper is to integrate social networking and the power of hadoop to analyze the vast student data and provide recommendations to them using machine learning and recommender systems on a social-cum-educational portal. Most of the recommender systems are not scalable and they do not deal with the vast amount of data required for their analysis and are rarely available in student

VIII. CONCLUSION

Using the growing power of social networking a social-cum-educational portal can be created integrated with recommender system. This would not only provide them with social networking but also educational facilities with recommendations. These recommendations can provide them with information for their areas of interest, their curriculum, similar friends and professors working in the same field, content about their study fields in various forms like texts, eBooks, videos, etc. Data analytics algorithms, machine learning algorithms play an important role in the study of smart student education system.

IX. FUTURE ENHANCEMENTS

The future enhancements of this system will include a lot of other social media and educational perspectives. Social media perspectives like the system will be able to let the connected users chat with each other so that they can have a direct way to communicate with each other on this platform wherein they can have discussions about all the educational courses and the recent advancements in their field of interest and can share their knowledge. It should also have the functions of creating user communities wherein all the users with similar area of interests or having certain similar ideas can create communities of their own just like we have it on our other social media platforms like Facebook. This kind of functionality lets the users of all hierarchical levels to connect and understand everyone's perspectives. For example a group of teachers and students can be created wherein they can have discussions and sharing of knowledge. The other enhancement can be increasing the data of the courses that the portal provides. The dynamic data scraping can be done and the quality of courses can be refined based on the top ratings. There can also be a section of News wherein all the news related to technology and the user's area of interest can be made available. News like all the technological advancements, inventions, conferences and everything can be made available.

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