An Algorithmic approach for recommendation systems for web blogs and microblogs

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Abstract- Now a days, Recommendations system is a pillar for each web portal and application. Recommendation systems are not specific to a single domain, it is applicable in diverse domains. It is used in social networking sites for posts and recommending friends; or e-commercial websites for giving suggestions for the user about products and services; or it's a movie recommendations based on the user's interest and suggest the upcoming movies which is well suited for a respective user. At the backend, the machine learning is used to give better recommendations and suggestions. In the paper, various algorithms are discusses with their implementation areas. A comparative study is discussed in the paper and a proposed algorithm which is well suited for the web blogs and the microblogs websites. A proposed approach uses the machine learning methodologies based on the user's point of interest. User's hobbies and the likings are the major concerns when the recommendation system recommends the posts and friends. Proposed algorithm is derived from various aspects to call it a hybrid algorithm for recommendation systems.

Index Terms- Content Curation, Hybrid Computing, Machine Learning, Recommendations Systems, Web Blogs

I. INTRODUCTION

This article gives the insight of recommendation systems and the approaches used in implementing of recommendation systems. Web 2.0 is a vast collection of the tools and services used by the end users in this digital era. As the business and the communication is increasing on web, the functionalities and services of the web are also increasing. Now a days, web services are smart enough to predict the pattern of user's search and recommends the related product and services to the user. [15]
Recommendation Systems are the useful features adopted by almost all the ecommerce websites and the service portals. This thing is good for the companies as well as the end users. Recommendation systems use the machine learning methods to process the input dataset and give the desired results. Recommendation systems are used by various web giants like Google, Amazon, Twitter, Facebook, LinkedIn, Netflix etc. [1][2][3][4]
In the paper, the various approaches of recommendation system is derived and the areas where they are implemented. The algorithms used in recommendation systems are also discussed in the paper.

II. THEORETICAL BACKGROUND

From the last few decades, the user's interest is the prime concern of all the commercial domains. Either the discussion is on reading and watching news articles or purchasing the products from the market. Many researchers had given their view in this area. Presenting the News based on the reader's choice has been in trend to sell the newspapers in market. Newspapers published the articles column wise to attract the readers on their interest areas [5] [6]. The trend can also be seen in the web news aggregators and how the news is presenting on such web portals [7].

Blogs are the category of Web tools which are based on individual's interest. Bloggers blog to share their ideas, thoughts, stories and views using blog posts. Blogs are the best way to communicate and share the things among friends and society. People share their experiences of watching movies, reading books and recommend places to visit via posts. Many blogs allow users to share and post pictures and clips as posts. Recommendation system in web blogs are doing tremendous job to make new connections and enlarge the blogosphere [8]. Recommender system in blogs is used for: *First,* to suggest the posts of other bloggers of same interest; *second,* to recommend the bloggers to follow them to get updates; third, to suggest the posts while posting a new post in blogger's page. [10]

Social Networking sites are the next version of blogs which are available with more features and services. Millions of users are using SNS daily to communicate with friends and their circle. In SNS, recommendation system gives friend suggestions based on the work place, home location, schooling and other common interests. Facebook, Instagram, LinkedIn are the major names under the domain. Role of recommender systems are very prominent in this area. [14][17]

Online communities and the discussion forums are the first choice of the users who have queries and doubts in their minds. Users generally google the questions and google recommends the best out of his database. The Search engines first recommend the forum links and further the forum will recommends the similar posts and threads to the users for more details. Quara, Howstuffworks, Yahoo answers, Reddit and many more. Most of the forums are designed for specific group of people. Like Stack Overflow is

more programmers and developers. The scope of recommendation system is enormous. Everywhere it is in use.

Now a day's users want to search the relevant content on web in minimum amount of time. It's hard to make an efficient system which searches the relevant data to the user on a click. To show the curated results and recommends the best search results as per user's interest is a typical task, and gets more complicated when we are going to apply on web data.[9] Figure 1 shows the list of Web 2.0 tools available for users to search and interact.

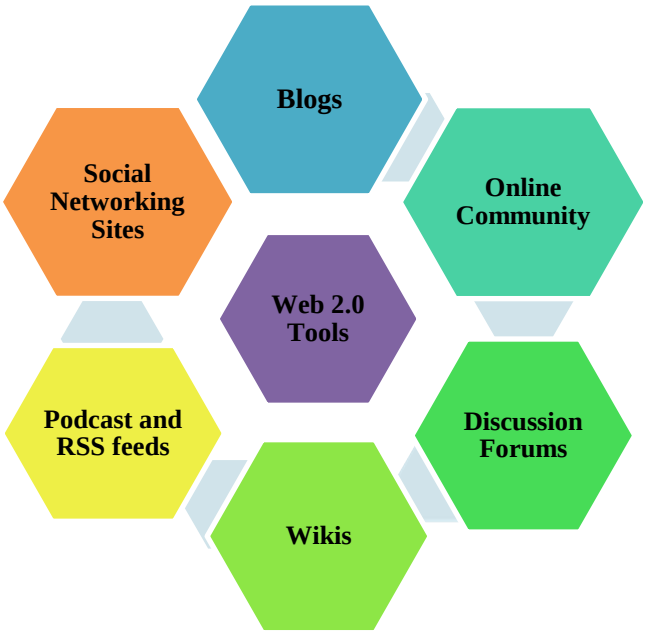

Figure 1: List of Web 2.0 Tools

III. SYSTEMATIC REVIEW

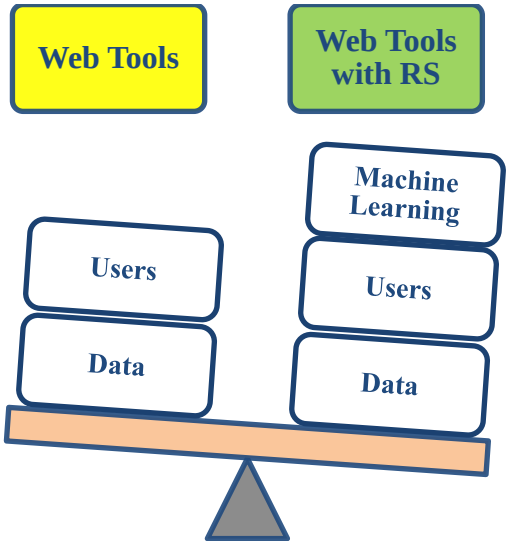

Figure 2: Role of Machine Learning in Web Tools and Services

To promote the recommendation systems, machine learning is the key factor. Machine Learning is the method which takes the previous data as input and analyze the patterns. Based on all permutation and combinations, the system will return the refined outcome. The results after applying the machine learning approaches, are far better than the traditional data mining methodologies. Today, the hybrid algorithms are in use which knits various algorithms and approaches in one cloth to get relevant and best output.

Various approaches and the applications of the recommender system is discussed in the paper by I. Portugal et al.[11]. Authors designed the paper in very streamlined manner to help the readers and researchers to work on recommender systems. In paper, the authors discussed about which recommender system is better for which domain and what machine learning approaches are good to use.

H. Khatter and A. K. Ahlawat discussed the approach associated with the clear relation of the user query and the content-based social relation of keywords. It was mentioned that the given web user query is pre-processed, and then the keywords are given to the Inverse Filtering. Based on such processing the recommender system works [12]. Figure 3 shows the overview of recommendation system using the collaborative filtering, and RNN/ CNN machine learning approaches.

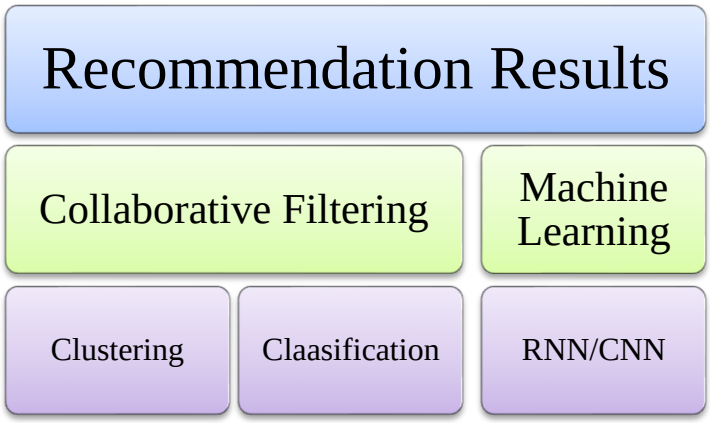

Figure 3: Hybrid Approach for Recommendation System

Most of the systems are based on collaborative filtering and the parameters are minimized using the principle component analysis. The outcomes are based on supervised learning and the refinement of the results are using the Recurrent Neural Network.
Alternate approach is to use the Content based filtering and regression analysis with Semi-supervised learning.
Apart from the mentioned ones, there are many researchers who developed the approaches using Matrix factorization of the user's interest and the posts, CNN method, SVD and Decision Tree methods. [11] [16]

IV. PROPOSED APPROACH

As mentioned in the theoretical background, the need of hour is to make an algorithm which curates the existing data and recommends the product and services to users to save their time. In case of blogs, the posts and the friend suggestions are the major classifications. The proposed algorithm is divided into two parts: *first*, posts recommendations and *second*, friend's suggestion to follow.

A. Posts recommendations:

Step 1: Collect all the posts with the keywords mentioned in user's point of interest.
Step 2: Mining of posts based on the followed users
Step 3: Consider the rating parameter to get the filtered posts and show to the user
Step 4: Check outliers for the interest matching with curated result.
Step 5: create a match index and show the results on behalf of match index.

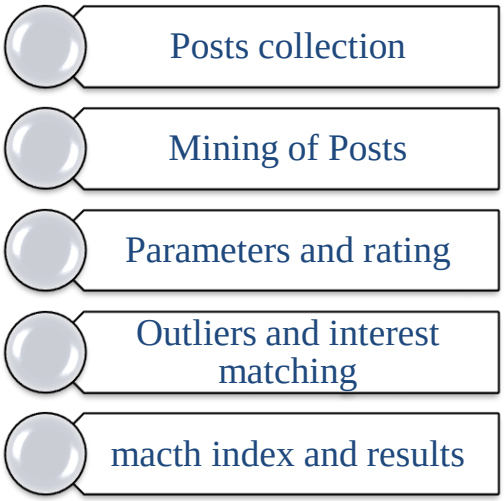

Figure 4: Steps for Posts recommendations

Figure 4 shows the approach for post recommendations. This proposed approach suit the blog post recommendations and based on the clicks and readings, the confidence of the algorithm will be increased.

B. Friends and bloggers suggestion:

Selection of Bloggers to give recommendation is difficult task as compare to the recommendation of blog posts. The blogger selection and suggestion is done on behalf of following parameters: Blogger's location, Work place, interests, hobbies, reading groups and books, visited places, following bloggers and the way of posting the posts.
Step 1: Curate the selected parameters of bloggers to filter out the principle key components.
Step 2: Classify the parameters and cluster them with same group of interest.
Step 3: Consider the common groups and the matching index based on curated parameters.
Step 4: Check the confidence based on the applied rules on the parameters.
Step 5: Show the suggestions to the users as the final results.

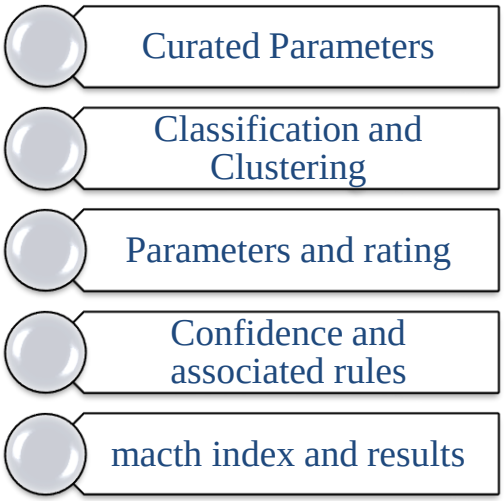

Figure 5: Steps for Friends suggestions

Figure 5 shows the approach for friends and bloggers suggestions. This proposed approach for friends and bloggers suggestion will improves the suggestions as user hits the suggested results.

In proposed approach is specially built for the blogs and microblogs.

V. CONCLUSION

Recommendation systems are the mechanism which refines the usage of the web tools. Users feel happy to use the services which save their time in surfing and searching the relevant thing i.e. friends in common group in case of SNS, products and services in case of ecommerce websites, similar questions and answers in case of online communities and discussion forums. Various approaches are clubs to suggest the proposed algorithm in this paper. It's an integration of machine learning and data analytics part to propose a hybrid approach for blog posts. The implementation of the suggested approach will surely enhance the productivity and efficiency of the domain.

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