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A Survey on Personalized News Recommendation System

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ABSTRACT: Recommendation Systems help users to find information and make decisions where they lack the required knowledge to judge a particular product. Also, the information dataset available can be huge and recommendation systems help in filtering this data according to users' needs. Recommendation systems can be used in various different ways to facilitate its users with effective information sorting. For a person who loves reading, this paper presents the research and implementation of a Recommendation System for a NewsReader Application using Android Platform. The NewsReader Application proactively recommends news articles as per the reading habits of the user, recorded over a period of time and also recommends the currently trending articles. Recommendation systems and their implementations using various algorithms is the primary area of study for this project. This research paper compares and details popular recommendation algorithms viz. Content based recommendation systems, Collaborative recommendation systems etc. Moreover, it also presents a more efficient Hybrid approach that absorbs the best aspects from both the algorithms mentioned above, while trying to eliminate all the potential drawbacks observed.

KEYWORDS: News Recommendation, prediction, algorithm

I. INTRODUCTION

News- famously thought of being an acronym for the four directions-North, East, West, and South is an enriching source of conveying information on current events and trends presented to the readers through different source of media like print, television, internet and now with current trends in smartphones, in the form of news applications. Research on the news applications for Android suggests that there are around thirty-five applications [2] in the market which keep the users updated with the latest news across the globe. These applications provide news from most read newspapers like BBC News, Fox News, The Guardian, The Times etc. Various news aggregator apps are also in market, which bring multiple sources of news under one roof like Google Currents, Pulse News, Zite. These newsreader applications as we can see, focus on either particular newspapers or collate data from various news sources and present them to the user as per the current trends. While these applications are immensely popular with the masses, they can still be enhanced to provide personalized data to the users. Recommendation Systems filter large information sets from various fields of study, relevant to the interests of the users. They guide the users in judging various features and products made available to them by recommending the current trends. These systems form matrices based on various attributes and methodologies to provide suggestions to the users. These can be based on user preferences expressed either explicitly or implicitly or current trends (as in the application, Google Currents)[3].

The goal of this paper is to explore the various recommendation techniques used such as: Content-based Filtering, Collaborative Filtering, and a Hybrid Model involving both, to study the algorithms in detail and develop a newsreader application on webpage Platform using one of these techniques. The project aims at concluding which filtering algorithm is apt for various users.

II. MOTIVATION

Right information added in proper shape to the fascinated and appropriate reader can assist in handing over the proper message. Nowadays, there are numerous approaches to eat information such as each offline and online sources. For the offline sources, typically readers acquire newspaper from handiest one newsagent daily, so they may get the information as handiest one factor of view from the acquired newsagent. In addition to the newspaper, the readers can pick out to acquire information from tv wherein maximum of newsagents have their personal channels, such as information reporters' packages on free channels. On the alternative hand, for the net resources, the readers have numerous alternatives to pick out to acquire the information. They can study the information immediately from

authentic websites, authentic line accounts, authentic web/cellular packages, or maybe hub websites and packages that accumulate and offer the information articles from many newsagents. However,

information from one of a kind newsagents frequently are event-primarily based totally, which means their contents are very similar. Also, there are great information articles for the readers to acquire; therefore, it conjures up us to create an internet software to offer a convenient and customized desire to the readers to acquire information articles primarily based totally on their preferences. The overarching intention of this mission is to create information recommendation machine as an internet software that recommends information articles primarily based totally on every user's preferences. Everyday newspaper brings myriad information with headlines one might not like to study. The tv information anchors hold bombarding testimonies likely an man or woman could hate to hear. My browsers and social media software program hold highlighting information the ones aren't of my desire. These undesired information presentation and non-stop pop ups worsen customers or even bring about undesired effect on persona and emotional setups. Negative information filtering and presentation of high quality information has been a place of targeted studies for pretty a few time . But information and textual content brings a whole lot of subjectivity. While one information is high quality for a institution of humans it is able to now no longer be high quality for any other set of readers. Some information can also additionally have very bad effect on a few touchy readers while different might not discover them that disturbing. It is intellectual endurance, emotional tolerance and customized pastimes that play a key function in identifying suitability of information for a man or woman. News is set general effect it supplies to reader. It will now no longer handiest make high quality effect on reader however additionally enhance the general readership. Right information added in proper shape to the fascinated and appropriate reader can assist in handing over the proper message.

III. RELATED WORK

1) Chong Feng, Muzammil Khan, Arif Ur Rahman and Arshad Ahmad “News Recommendation Systems - Accomplishments, Challenges & Future Directions”

Instead of using traditional newspapers to distribute news, news organisations are increasingly using websites and mobile applications that are designed specifically for that purpose. It has been found that news recommendation algorithms can analyse lengthy articles automatically and find related content. For readers taking into account predetermined criteria. Identification and classification are the main goals of the current effort. Finding cutting-edge methods and categorising the issues in the news recommendation domain application domain, the evaluation methods employed, the datasets and sources from which they were derived and to emphasise the difficulties that are specifically mentioned. Over the course of time, the literature is thoroughly examined. Of 2001-2019 and selected 81 related papers. These studies were then roughly categorised into six categories and analysed. The 60% of news recommendation systems were adopted, according to study.

2) Hrishikesh Kulkarni, Rohan Kalyanpur, Tejas Joshi and Nikhil Sanap “ Personalized Newspaper Based on Emotional Traits Using Machine Learning”

We now place a lot of importance on the news. It can appear in a variety of ways, from morning newspapers to internet pop-up ads. Presented with news in In a random manner. delivering customised news based on a person's preferences for emotions, moods, and behaviours must be considered. Unknowingly, news can produce desired or undesirable effects impact on the mind. Title, presentation, and all other machine learning from sequencing to filtering and personalisation and cognitive sciences can be important in the field of news computing. This essay examines studies conducted in the elaborately in the cultural and news computing presents a framework for individualised presentation and sequencing the news. This unique newspaper tries to provide information on your preference and emotional needs.

IV. PROBLEM STATEMENT

Newsreader applications as we can see, focus on either particular newspapers or collate data from various news sources and present them to the user as per the current trends. While these applications are immensely popular with the masses, they can still be enhanced to provide personalized data to the users. Recommendation Systems filter large information sets from various fields of study, relevant to the interests of the users. They guide the users in judging various features and products made available to them by recommending the current trends. These systems form matrices based on various attributes and methodologies to provide suggestions to the users.

V. PROJECT SCOPE

Evidence provided in this study indicates future research should focus on specific design choices when investigating personalized systems. Web portal designers would benefit from collaborating on future personalization research in

order to create personalization systems that meet stated design goals as well as promote a positive user experience and positive democratic outcomes. The personalized portal software developed for the experiment presented in this study or packages similar to it can be useful for future research. Due to the fact that this study was in a small controlled information environment, results should be replicated and tested in an externally valid environment to provide confirmation of the findings. Very easy to use and being a web application, it is very feasible. Everybody has a active internet connection, therefore everybody can use it. The scope of the recommendation system is very high because in the world of big data, everyone would like the content they see to be very personalized.

VI. METHODOLOGY

A. Software Requirement:

- Software Requirements:
- Minimum of 8Gb of Ram,
- Processor @ 2.40GHz 2.42 GHz,
- 64-bit operating system, x64-based processor
- OS – Linux/Windows
- Software – Python, Jupyter Notebook

B. Description of the Proposed Algorithm:

The user class includes all age groups. It will be beneficial for everyone to use the news recommendation system in order to get personalized news. Users' preferences for news are not only based on news topics and news content, but also based on the users' current contextual information such as user location, time, social information and major events at home and abroad. Therefore, personalized news recommendation needs to consider specific contextual information and relationships between different news. News readers are easy to be affected by their friends or events on social network, so there are many social influencing factors that need to be considered in personalized news recommendation. Even though explosive and popular news are not related to users' interest preferences, they may also be of great interest to users due to users' herd mentality or other factors. Therefore, users' interest transfer should be fully taken into account. News have a strong timeliness performance, and update very fast. So each piece of news has a short life cycle. Making personalized news recommendation should focus on current news rather than outdated news. The amount of news data and the number of users are both huge, and the growth rate is very high. So personalized news recommendation technology must be able to adapt to such a large amount of data to provide scalable news recommendation service with a small response time. Users' interaction data and news texts are mostly unstructured in personalized news recommendation, and the unstructured attribute makes it more difficult to analyze the relationship between users and news. Besides, the freshness factor of news may occupy higher weight than the correlation factor between news and users in some cases. And it is important for personalized news recommendation to recommend news with novelty to readers at any time. Since two irrelevant news texts may share lots of same or similar words, high similarity values based on words may not represent a strong relationship between news. And news readers may have special preferences for certain events in the news, called named entity.

VII. ADVANTAGES

- Considers the change of user preferences over time and domain
- Identifies each user's useful patterns
- Enriches valuable neighbours patterns.

VIII. CONCLUSION

This project studies the Content-Based and Collaborative-Based Approaches in detail and comes up with a Hybrid Model for Recommendations. The Hybrid Model wins over the individual approaches in terms of encompassing positive aspects of both the algorithms and tries to remove the shortcomings. Since this is a hybrid model, even when the actual recommendations start after a week's activity, the user still gets to read popular newspapers. Different attributes essential for the success of a Recommendation System such as Novelty, Trust, Coverage, and Privacy are addressed.

New features can be added to the application, which give the user a facility to add categories or newspapers. Cloud based approach for storing data can be used to improve the overall storage and processing of data..



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