

Using Data Mining Hospital Recommender System

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Abstract— Recommender systems help the users to get the useful information regarding their search. To overcome the disadvantages of content-based filtering and collaborative filtering, Hybrid filtering is one of the best suitable approaches. Hospital Recommendation Services have been gaining popularity these days. There are many applications and systems that are recommending hospitals based on the user's requirements and to meet the patient satisfaction. These applications take the reviews of the patients and the users and based on these reviews, they recommend the hospitals. Also if a person is new to the location that he is currently residing, when the specialty is given as input by him, then these applications recommend the hospitals. But the problem is that everyone is not aware of the medical terms like specialties. For those people, "Health or hospital Service Recommendation System" comes handy. "Health Service Recommendation System" is an Android Application for finding hospitals within a specified range of distance and requirements provided by the client using the Naïve Bayes classification algorithm. Naïve Bayes algorithm classifies the specialty and thus helps in achieving the maximum accuracy compared to the other algorithms used. This application is helpful even for the people who are not aware of the specialties of the hospitals. This paper overcomes these issues by using Hybrid Filtering. This system fetches the information from the user and displays the nearby hospitals related to it. In this paper, the location of the user and the requirement of which type of hospital should be mentioned by the user itself. Among the detected hospitals it suggests the hospitals to users based on the user ratings. Based on the Hybrid filtering approach recommend the hospitals to the account holders. Depends on the specialty of the Hospital and user preference, the Similarity is calculated using the cosine similarity concept. In Hybrid filtering, we consider the constraint which was given by the user. The main objective of this paper is to recommend the best hospitals to the users which will be helpful in emergency situations methods.

Keywords: Collaborative filtering (CF), Content Based filtering (CBF), Cold start problem, recommender system, hospital recommendation, user preference

I. INTRODUCTION

With the success in the rapid development of internet, people can obtain any information whenever they want. But, day to day new information is getting added which causes a problem of information overload. Recommender systems act as an effective solution to information filtering. It helps the users to obtain the personalized and useful information regarding their search.

People are not aware of the hospitals that provide better quality health service. Patient satisfaction is the main criteria for recommending the hospitals. Browsing online and spending hours together in the search for hospitals that

provide better quality health service is a time-consuming process and does not provide relevant results. In case of emergency situations such as accidents, the patient has to be taken to the nearby hospital despite the other features such as ratings of the hospital. In that situation, our application comes into picture recommending the hospitals within the range specified by the user using recommender system. Recommender system is the software product which recommends most suitable item or place or product based point of interest. When people move to the new places, they will not be aware of the hospitals around their current location. In that case, our application will use the different parameters to find the recommends the hospitals based on the requirements like budget, user review, services.

According to the survey, techniques used for recommendation are classified on the basis of knowledge sources. For instance, Collaborative Filtering technique works on user item preference data while Content-based technique is based on item features. Collaborative filtering identifies the likely preferences of the user, based on the known preferences of similar users. Since collaborative filtering relies only on other user recommendations (ratings), the number of ratings already obtained is usually small, compared to the number of ratings need to be predicted. This results in sparsity issue as well as cold start problem. In content-based filtering, there is an absence of personal recommendations. Because of the lack of consideration of other people's experience, recommendations are based on the items attributes, descriptions, tags, among others and therefore, missing any personality assessment.

II. SIGNIFICANCE OF THE SYSTEM

The paper mainly focuses on how machine learning techniques in Data mining can be applied to predict hospital admission at the time of ED triage using patient history in addition to information collected at triage. The study of literature survey is presented in section III, Methodology is explained in section IV, section V covers the experimental results of the study, and section VI discusses the future study and Conclusion.

III. LITERATURE SURVEY

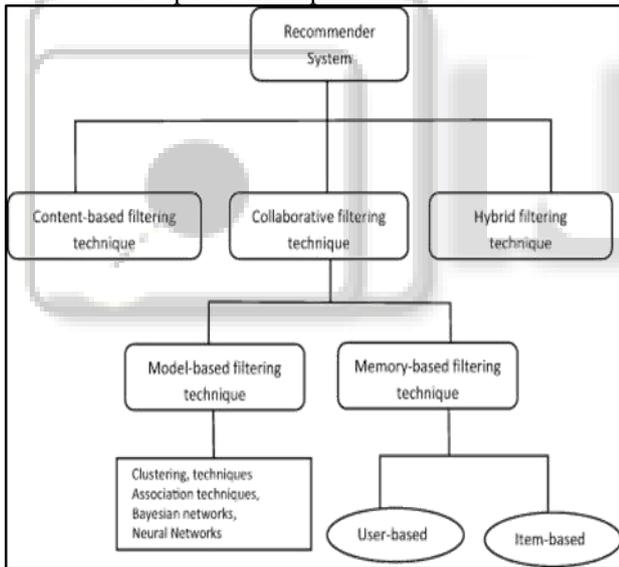
Recommendation System Recommendation systems are a subclass of information filtering system that explore to anticipate the 'rating' or 'preference' that a user would give to an item. Recommender systems have changed the way people find products, information, and even other people. The technology behind recommender systems has evolved over the past 20 years into a rich collection of tools that enable the practitioner or researcher to develop effective recommenders. Recommendation system can also be referred as 'Information Filtering Technology'. Recommendation systems used to find

doctor profiles and hospital names according to user ratings rapidly and exactly. „Extractor“ abstracts the data frequently required by users from huge database by performing pre-processing of data. Extracted data get stored in predefined XML templates for further processing. Data collected in information extraction process is emerges as the document. Document contains environment for learning the rules of information extraction and extracting required information. Such document can be categorized into three types as 'Structured documents', 'Unstructured documents', 'Semi-structured documents'. As type of document varies, method for learning the rules also varies.

IV. METHODOLOGY

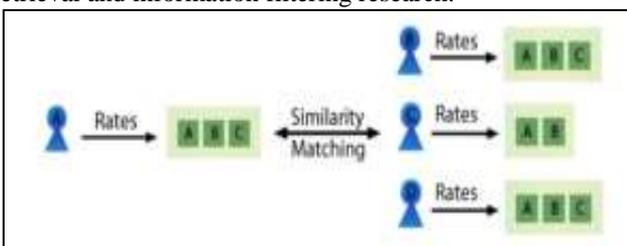
A. Collaborative Filtering:

Collaborative filtering approach is widely used to design recommendation systems. This approach depends on gathering and examining a huge amount of information on users' behaviours, activities or preferences and predicting what users will like based on their similarity to other users. A key benefit of the collaborative filtering technique is that it does not rely on machine analysable content and therefore it is capable of accurately recommending complex items. When building a model from a user's profile, a distinction is often made between explicit and implicit forms of data collection.



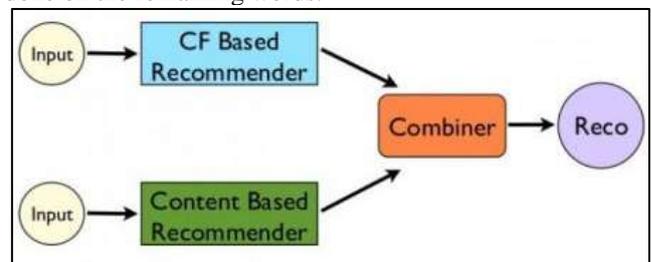
B. Content-Based Filtering:

Content based filtering is based on description of the item and a profile of the user's preference. In a content-based recommender system, keywords are used to describe the items; beside, a user profile is built to indicate the type of item this user likes. This technique has its origin in information retrieval and information filtering research.



C. Hybrid Filtering:

Hybrid filtering tries to merge different techniques to mutually remove their weakness, so the proposed Medical based personalized recommendation systems have combined top-k query algorithm, keyword extraction and user-based personalization. Aim of top-k query is to deliver most accurate answers to the users query from large dataset. Top-k query algorithm is used to search out precise records from the given record set that matches the filtering keyword, and arrange them according to their scores. Top-K query algorithm uses scores documents against keywords. Here, topk query is used to retrieve doctor and hospital name. In keyword extraction process, Keywords are abstracted from hospital type and doctor specialty and are matched against each tuple stored in the database. The searched text entered for searching is marked as keyword and the low priority words are truncated and the process keyword extraction is done on the remaining words.



V. DATASET DESCRIPTION

A data set (or dataset) is a collection of data. Most commonly a data set corresponds to the contents of a single database table, or a single statistical data matrix, where every column of the table represents a particular variable, and each row corresponds to a given member of the data set in question.

A. System Design

During analysis, the focus is on what needs to be done, independent of how it is done. During design, decisions are made about how the problem will be solved, first at high level, then at increasingly detailed levels. System design is the first design stage in which the basic approach to solving the problem is selected. During system design, the overall structure and style are decided. The system architecture is the overall organization of the system into components called subsystems. The architecture provides the context in which more detailed decisions are made in later design stages. By making high level decisions that apply to the entire system, the system designer partitions the problem into subsystems so that further work can be done by several designers working independently on different subsystems.

The system designer must make the following decisions:

- Organize the system into subsystems.
- Identify the concurrency inherent in the problem.
- Allocate subsystems to processors and tasks.
- Choose an approach for management of data stores.
- Handle access to global resources.
- Choose the implementation of control in software.
- Handle boundary conditions.

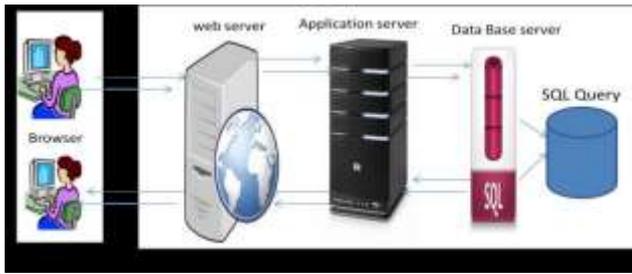


Fig. 1: System Design

VI. CONCLUSION AND FUTURE WORK

Recommending the hospitals based on the patient requirements and to meet his satisfaction is important criteria. In order to recommend the hospitals, the patient has to be aware of the specialties under which he should be treated. But unfortunately, not everyone is aware of the specialties. So, the proposed system not only recommends the hospitals based on the specialties but also helps those who are not aware of the specialties' by taking the symptoms of the patients' disease and predicts the specialty.

This system has been designed keeping in mind the requirements of a public to select hospital as per their needs & which fulfil their economical as well as required expectations as per criteria required to identify best hospital service.

By using this system data collected from different views will be helpful to predict best service provider which definitely provide satisfaction to all peoples who interact with this system.

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