

Recommender System for Machine Learning with Big Data in Education

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Abstract - Machine Learning (ML) is the exploration of making calculations and program which learn alone. When planned, they do not bother with a human to turn out to be better. Big Data is one of the incredible difficulties for Learning Machine (LM) calculations on the grounds that most genuine applications include a bit of monstrous data or huge information base. Big data is the tremendous increase in structured and unstructured data collection. Recommender Systems figure a user's equivalence among users and use it as a weight for the users' evaluations. Nevertheless they have numerous shortcomings, for example cold start. Recommendation systems are of particular interest to organizations that want to analyze user choices and customize other user's content. These papers study the use of machine learning. In big data, opportunities for recommender system and presents recommendations system in education.

Keywords — Big data, Machine Learning, Recommender system in education

I. INTRODUCTION

The term Artificial Intelligence (AI) is clear as crystal. Machine Learning is a significant field in Artificial Intelligence. Machines figure out how to perform undertakings that aren't explicitly customized to do. Machine learning supports data science by providing data analysis, data preparation, and even decision making, such as real time testing, online learning. Data Science clubs together machine learning algorithms to provide a solution. Data Science performs this activity by taking many ideas from basic mathematics, statistics and expertise in the domain. Big data analysis is a flow territory of innovative work. Big Data is categorized in five V's Volume, Velocity, Variety, Veracity and Value refer Figure a. The ability to extract value from Big Data depends on data analytics [1]. Big Data Analytics consists of specialized Software and analytics systems in many ways, such as cost efficiency, faster decision making, new products and services.

A recommendation system seeks to predict a user would give an object the "rating" or "preference".

These systems are used in different areas such as movies, news, books, articles, search queries, social tags, and so on.

Recommendation Systems generate a list of recommendations typically through collaborative filtering or content based filtering in one of two ways.

OBJECTIVES:

- To study the use of machine learning in big data
- To study the opportunities for recommender system
- To understand role of recommender system in education

II. ML IN BIG DATA

Machine learning is aimed at discovering knowledge and making smart decisions. Machine learning algorithms can be divided into supervised, unsupervised, and semi-supervised. Machine learning approaches include learning decision making, learning rules for associations, artificial neural networks, Support Vector Machines (SVM), clustering, Bayesian networks, and genetic algorithms, etc. Supervised learning algorithms include various examples such as Naive Baye's, boosting algorithm, support vector machines (SVM), and maximum entropy method (MaxENT), etc. Unsupervised learning

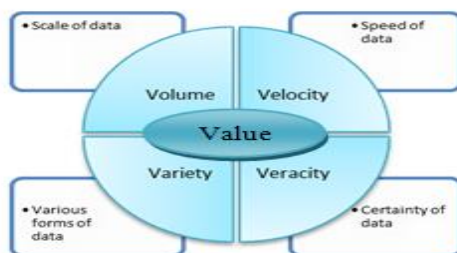


Fig. a) The Five V's of Big Data

takes unlabelled information and arranges by looking at information highlights. Unsupervised learning algorithms includes various examples such as clustering (k-means, density-based, and hierarchical, etc.), self-organizing maps (SOM), and adaptive resonance theory (ART)[2].

Machine learning has been used in big data. Big data is a massive volume of structured as well as unstructured data that is so large that traditional database and software techniques make it difficult to process. Big data technologies have great impacts on scientific discoveries and value creation [3] [4] [1]. Massive parallel-processing (MPP), distributed file systems, and cloud computing, etc. support Big Data [5]. Besides general cloud infrastructure services, technologies such as Hadoop, Databases/Servers SQL, NoSQL, and MPP databases, etc. are also used to support Big Data [6]. Big Data Analytics consists of specialized software and analytics systems in many ways, such as

Cost effectiveness: Hadoop and cloud based analytics are highly cost effective Big Data Analytics technologies when large amounts of data are stored. This also helps to find more effective ways to do business.

Faster decision making: Organizations can use superfast Hadoop and in memory analytics to examine data immediately. Based on what they have experienced, decisions can be taken with great ease.

New products and services: Big data analytics helps to understand consumer needs and preferences easily, giving customers more power to serve what they want. To meet the needs of the customer, more products and services can be developed.

III. OPPORTUNITIES FOR RECOMMENDER SYSTEM

Recommender system can foresee whether a specific user would favor a thing or not founded on the user's profile. The recommendation system is defined as a strategy for users to take decisions in complex information environments [8]. The objective of Recommender Systems is to create proposals about new things or to anticipate the utility of a particular thing for a specific client. Recommender systems bolster clients in logical libraries by empowering them to move past list look. In this way, it is beyond the realm of imagination to over - underline the need to utilize compelling and precise proposal methods inside a framework that will furnish clients with significant and solid suggestions. Recommender systems are beneficial to both service providers and users [7].

Broadly the Recommender systems are categorized as of five types namely referred Fig. (b)

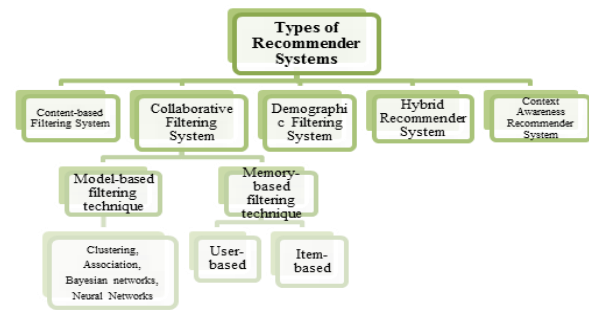


Fig. b) Types of Recommender System

Content-based Filtering Recommender System:

They suggest items dependent on items of things instead of different clients rating of the framework. Rather than utilizing a client to an item connection and characterizing techniques, they use thing to-thing relationship for creating suggestions. Following advances are done during the time spent creating suggestions: Gathering content information about the item Process the information and concentrate information valuable highlights and components about its content.

Advantages: The content-based methodology doesn't require information of different clients and has capacities of prescribing items to the client with one of a kind taste. It keeps away from first rater issue.

Disadvantages: Content based filtering contains items is limited to their initial descriptions or features.

Collaborative Filtering Recommender System:

They depend on a couple of clients who are most like the present or dynamic clients. The collaborative filtering can be adjusted with different strategies, whose emphasis is on the connection between the things and their clients. They are:

I. User-based Collaborative Filtering (CF): For each user or customer, we can compute correlation with other users or customers. For everything, total the rating of the users or customers exceptionally connected with every user or customer. Issue: sparsity, simple to assault.

II. Item-based Collaborative Filtering (CF): For each or other item, compute correlation with other items. For each users or customers, aggregate his rating of the items highly correlated with each items.

Advantages: Collaboration filtering is a methodology which needn't bother with a portrayal of an item as far as highlights yet it depends just on the judgment of taking an interest their user network.

Disadvantages: The item can't be recommended to any of the clients until and except if the thing is either appraised by another client.

Demographic Filtering Systems:

It utilizes prior learning of statistic data about the clients and their conclusions for the prescribed things as a reason for proposals. Demographic systems are cliché, on the grounds that they rely upon the supposition that all clients having a place with a specific demographic gathering have alike taste or inclination.

Advantages: It doesn't require a history of customer evaluations that are required by collaborative and content-based strategies. This is a fast, simple and straight forward methodology for mentioning results dependent on couple of objective facts.

Disadvantages: Concerning the security and protection issue, social occasion of complete client data is unreasonable.

Hybrid Recommender Systems:

It is another class of recommender system that attempts to beat the impediments of different methodologies talked about previously. It is a mix of at least two diverse recommendation techniques. The most well known hybrid methodologies are those of content-based and collaborative filtering. It utilize both thing content and the evaluations of all clients [9].

Context-Aware Recommender System:

It is a standout amongst the most slanting recommender systems nowadays. It helps in giving different and precise suggestions to the client. The relevant data may incorporate an area of the client, Identity of individuals around, date, season and temperature and so forth [10].

IV. RECOMMENDATION SYSTEM IN EDUCATION

In figure C, it represents the recommender system in education; first we collect the student's information using Moodle System. Using this Moodle, student login with their accounts and give the option regarding their interested subjects. Moodle system will collect the student's choices about the courses using Moodle database from where we can collect the data. The data is converted into appropriate format to find the best combination of subject. Then, model is created which contains machine learning algorithm to find the best courses which the students are interested in. This Model is analyzed using current output with the existing algorithm and best solution is found which will give the best output based on the student's choice. The yield of this investigation can be utilized by colleges or

universities to propose elective courses to understudies.

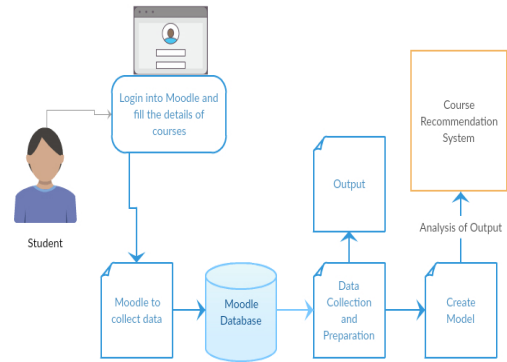


Fig .C) Recommendation System in Education

V. CONCLUSION

Recommender Systems are an amazing new innovation for extricating extra an incentive for a business from its user's databases. These frameworks help users and items they need to purchase from a business. Recommender Systems benefits users by empowering them to and things they like. On the other hand, they help the business by producing more deals. Recommender Systems are quickly turning into an essential device in E-trade on the Web. Recommender Systems are being stressed by the colossal volume of users information in existing corporate databases, and will be focused considerably more by the expanding volume of user information accessible on the Web. New advances are required that can drastically improve the adaptability of recommender Systems. In this paper we analyzed recommender system in education and analyze the educational information that generates predictions to find the best courses which are students are interested in.

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