NutriSmart- Food Products Recommendation System

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Abstract:- The purchasing behavior of the user is influenced by the recommendations provided to the products. Recommendation can be in the form of review or rating given to a particular product. The food consumed by the peoples includes carbohydrates, fat, protein, minerals and vitamins and any lack of nutrition leads to serious health issues. In this paper, we propose a recommendation system that is trained from the reviews provided by the buyer who has previously used the same product. NutriSmart application recommends the product to buyer based on the experience of the user who has used the same product. Every individual have their own food habits and based on likes and dislikes of user, suggesting an optimized nutrition becomes essential to maintain progress and health of the user. The proposed recommendation system uses deep learning algorithm and genetic algorithm to provide the best possible recommendation.

Keywords:- Recommendation System, Optimized Nutrition, Genetic Algorithm.

I. INTRODUCTION

Nutrition is defined as consumption of food, treated in relation to the nutritive needs. The lack of nutrition in food may lead to diminished immunity, susceptibility to illness etc. The e-commerce sites have been increasing rapidly in today's world and many of them provide their own recommendation system to provide recommendation to the purchaser. Different types of algorithms have been used by different product recommendation system in the intention of providing accurate products to the users. Some recommendation system allows all people to provide reviews or rating about the product, irrespective of whether the person has purchased that product or not. Genetic algorithm is considered in providing recommendation to buyer based on their likeliness. The nutrition is divided into five types i.e. energy, sugar, proteins, fats and salts. The genetic information of the user or purchaser is always constant but the recommendation of the products is dynamic so as to provide an accurate product that matches with user likeliness over time. Here the TESCO dataset is used to provide recommendation to the users. The reviews are collected from the famous websites such as Amazon, MouthShut.com and Snapdeal for taking the review about the desired product and then techniques such as data cleaning, tokenization, frequency computation, product feature frequency is used to get specific words from the set of reviews. In the user log in page, the user is posed with a set of questions to categorize them into any nutrition gainers such as salt, protein, sugar, fat etc. Based upon the option chosen, the rating is provided to the specific user with one or more nutrition gainers having highest rating with it. Hence using this concept, the product is recommended according to the purchaser's likeliness. This technique provides easiest way to sort the user liking products.

II. EXISTING SYSTEM

The current recommendation system uses collaborative, hybrid recommendation, content based algorithms. But certain limitations are found by using these algorithms. Some recommendation system allows everybody to provide reviews about any product; hence this doesn't provide exact output, as some false data may be present within the set of reviews. This paper provides extensions to previously occurring problems, and hence enhances the recommendation so as to provide exact matching products according to the purchaser's needs.

III. NUTRISMART SYSTEM

In this proposed approach a set of products are defined. The TESCO data set are collected for the grocery products under category chocolate, yogurt, biscuit and noodle. After that, with the help of deep learning algorithms, the classification of products is performed into five categories such as salt gainers, protein gainers, energy gainer, fat gainers and sugar gainers. Once the purchaser registers to the grocery store based upon the questions asked to the customer, genetic algorithm is designed to establish a relation between customer profile and product. Finally at the end recommendations are generated for the user based on personal phenotype and product classification. The final outcome is a complete web application in which customer is allowed to register, purchase grocery products. Admin is allowed to perform classification and can also impose questions about the user food habits and the algorithm provides recommendations about the best food product suited under the user category.
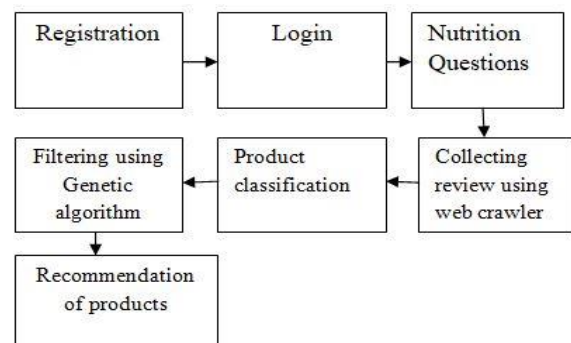

Fig 1:- Steps involved in NutriSmart application

IV. ARCHITECTURE

The diagram below illustrates the various extremity points. The web.xml allows only legitimate request into the web container maintained by tomcat. The complete user interface is designed based on JSP, Ext JS and Angular JS. The RESTFul Services are used throughout algorithm and business services implementation. The data is reserved and reacquired in the data store by the respective service. This paper is implemented using open source server like Apache Tomcat. The application allows only authentic users to access the services. The web crawler based online review submission will have the input elements like web URL, products and XPath. The Web URL and XPath will be authenticated at first. If valid, then a real HTTP connection is formed with the web site. User profile is generated based on the questions. Word embedding and deep learning is used for product classification i.e. training data is provided to this algorithm. Unique words from the training data is found, then it computes the occurrence of the words and generates a matrix of M*N word vector where M is number of reviews and N is the number of unique words amongst all the reviews. Once the word vector is found, later it acts as an input for the classification. The genetic algorithm is applied on the product classification. Hence, it establishes a relationship between user and the product. The products are recommended to the user based on likeliness found from the nutrition based questions asked to the user.
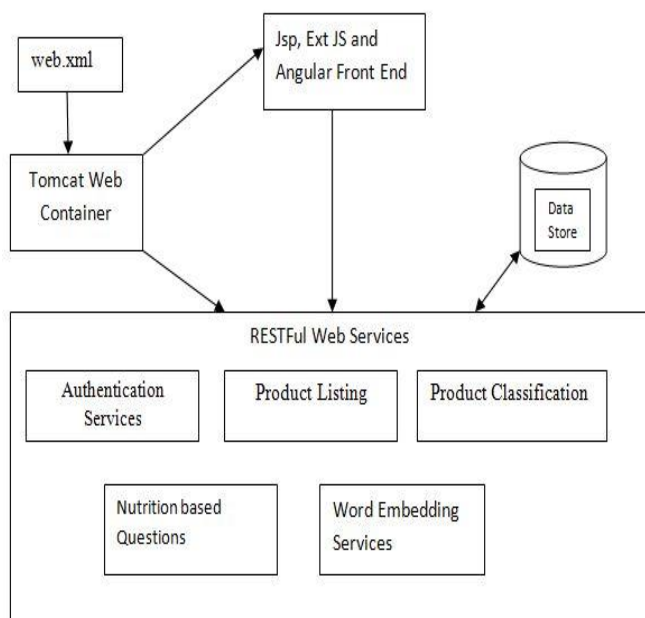

Fig 2:- NutriSmart architecture

V. RESULTS

Following are the snapshots of outcomes regarding the application developed.

1. The application developed allows people to register themselves if an individual is new to the application.

Fig 3

2. Various nutrition based questionnaire is imposed to the user to know the category of nutrition that the user belongs to such as energy, protein, fat, sugar and salt.

Fig 4

3. The user is distinguished in one or more feature type based on the nutrition questions answered.

Fig 5

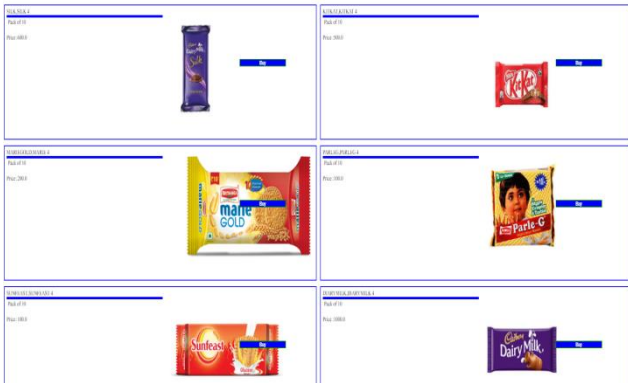4. The products are recommended to the user based on likeliness i.e. sugar and salt.

Fig 6

VI.   CONCLUSION

In this paper, by including web crawler algorithm, the admin will be able to collect reviews online. The sequence of word embedding algorithms such as data cleaning, tokenization, frequency computation and product classification algorithm is used in the classification of products. The buyer is allowed to login with valid testimonials and based on questions asked regarding nutrition intake, using genetic algorithm, the recommendations are provided. Consequently, it becomes elementary for the user to know about the ongoing intake of nutrients and based upon it, the user is recommended with certain products. Hence, this system is responsible of providing valid products to the user. The recommendations are provided based on user likeliness.

FUTURE SCOPE

The system for now administers recommendations to the user based upon their likeliness and furthermore system can provide custom recommendation for the user having any genetic complications such diabetes, heart problem, hypertension etc. Furthermore, this paper can be extended to add more sections of products to contribute solutions about recommendation to various user liking products with particular nutrition gainers. This paper can also be incorporated with social media to aggregate the reviews associated to the product.

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