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A Hotel Recommendation System using Big Data using Keyword Aware Service Recommendation Method

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ABSTRACT

Service recommender systems have been shown as valuable tools for providing appropriate recommendations to users. In the last decade, the amount of customers, services and online information has grown rapidly, yielding the big data analysis problem for service recommender systems. Consequently, traditional service recommender systems often suffer from scalability and inefficiency problems when processing or analysing such large-scale data. Moreover, most of existing service recommender systems present the same ratings and rankings of services to different users without considering diverse users' preferences, and therefore fails to meet users' personalized requirements. In this paper, we propose a Keyword-Aware Service Recommendation method, named KASR, to address the above challenges. It aims at presenting a personalized service recommendation list and recommending the most appropriate services to the users effectively. Specifically, keywords are used to indicate users' preferences, and a user-based Collaborative Filtering algorithm is adopted to generate appropriate recommendations. To improve its scalability and efficiency in big data environment, KASR is implemented on Hadoop, a widely-adopted distributed computing platform using the MapReduce parallel processing paradigm. Finally, extensive experiments are conducted on real-world data sets, and results demonstrate that KASR significantly improves the accuracy and scalability of service recommender systems over existing approaches.

Keywords: Recommender system, preference, keyword, big data, MapReduce, Hadoop,Navie bayes, data mining.

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I. INTRODUCTION

Service recommender systems have been shown as valuable tools for providing appropriate recommendations to users. In the last decade, the amount of customers, services and online information has grown rapidly, yielding the big data analysis problem for service recommender systems. Consequently, traditional service recommender systems often suffer from scalability and inefficiency problems when processing or analysing such large-scale data. Moreover, most of existing service recommender systems present the same ratings and rankings of services to different users without considering diverse users' preferences, and therefore fails to meet users' personalized requirements. In this paper, we propose a Keyword-Aware Service Recommendation method, named KASR, to address the above challenges. It aims at presenting a personalized service recommendation list and recommending the most appropriate services to the users effectively. Specifically, keywords are used to indicate users' preferences, and a user-based Collaborative Filtering algorithm is adopted to generate appropriate recommendations. To improve its scalability and efficiency in big data environment, KASR is

implemented on Hadoop, a widely-adopted distributed computing platform using the MapReduce parallel processing paradigm. Finally, extensive experiments are conducted on real-world data sets, and results demonstrate that KASR significantly improves the accuracy and scalability of service recommender systems over existing approaches.

In recent years, the amount of data in our world has been increasing explosively, and analyzing large data sets—so-called "Big Data"—becomes a key basis of competition underpinning new waves of productivity growth, innovation, and consumer surplus . Then, what is "Big Data"?, Big data refers to data sets whose size is beyond the ability of current technology, method and theory to capture, man-age, and process the data within a tolerable elapsed time. Today, Big Data management stands out as a challenge for IT companies. The solution to such a challenge is shifting increasingly from providing hardware to provisioning more manageable software solutions . Big data also brings new opportunities and critical challenges to industry and academia .Similar to most big data applications, the big data tendency also poses heavy impacts on service recommender systems. With the growing number of alternative services, effectively recommending services that users preferred has become an important research issue. Service recommender systems have been shown as valuable tools to help users deal with services overload and provide appropriate recommendations to them. Examples of such practical applications include CDs, books, WebPages and various other products now use recommender systems . Over the last decade, there has been much research done both in industry and academia on developing new approaches for service recommender systems .

A. **Problem Statement**

To improve the scalability and efficiency of our recommendation method in "Big Data" environment, we implement it in a MapReduce Framework on Hadoop by splitting the proposed algorithm into multiple MapReduce Phases.

B. Motivation

With the success of the Web 2.0, more and more companies capture large-scale information about their customers, providers, and operations. The rapid growth of the number of customers, services and other online information yields service recommender systems in "Big Data" environment, which poses critical challenges for service recommender systems. Moreover, in most existing service recommender systems, such as hotel reservation systems and restaurant guides, the ratings of services and the ser-vice recommendation lists presented to users are the same. They have not considered users' different preferences, without meeting users' personalized requirements. Following is an example in hotel reservation system illustrating such a case.

II. RELATED LITERATURE SURVEY

In recent years, the amount of data in our world has been increasing explosively, and analyzing large data sets—so called "Big Data"—becomes a key basis of competition underpinning new waves of productivity growth, innovation, and consumer surplus [1]. Then, what is "Big Data"?, Big data refers to data sets whose size is beyond the ability of current technology, method and theory to capture, manage, and process the data within a tolerable elapsed time.

Today, Big Data management stands out as a challenge for IT companies. The solution to such a challenge is shifting increasingly from providing hardware to provisioning more manageable software solutions [2]. Big data also

brings new opportunities and critical challenges to industry and academia [3], [4]. Similar to most big data applications, the big data tendency also poses heavy impacts on service recommender systems. With the growing number of alternative services, effectively recommending services that users preferred has become an important research issue. Service recommender systems have been shown as valuable tools to help users deal with services overload and provide appropriate recommendations to them. Examples of such practical applications include CDs, books, webpages and various other products now use recommender systems [5], [6], [7]. Over the last decade, there has been much research done both in industry and academia on developing new approaches for service recommender systems [8], [9].

III. EXISTING SYSTEM

(Keyword-Aware Service Recommendation method, KASR). In this paper, we propose a keyword- aware service recommendation method, named KASR. In this method, keywords are used to indicate both of users' preferences and the quality of candidate services. A user-based CF algorithm is adopted to generate appropriate recommendations. KASR aims at calculating a personalized rating of each candidate service for a user, and then presenting a personalized service recommendation list and recommending the most appropriate services to him/her. Moreover, to improve the scalability and efficiency of our recommendation method in "Big Data" environment, we implement it in a MapReduce framework on Hadoop by splitting the proposed algorithm into multiple MapReduce phases.

A. Disadvantages

Dataset for the Naive Bayes should be biased (proper format).

IV. PROPOSED SYSTEM

To improve its scalability and efficiency in bigdata environment, KASR is implemented on Hadoop, a widely-adopted distributed computing platform using the MapReduce parallel processing paradigm. Finally, extensive experiments are conducted on real-world data sets, and results demonstrate that KASR significantly improves the accuracy and scalability of service recommender systems over existing approaches. And we are using naïve based theorem for the retrieval of exact data.

A. System Architecture

In this system we have admin panel which is responsible for add and manage dishes in our system and also add and manage hotels in the system and client application have the android application from that user is able to sign up in the system and login in the system.

User is able to search the dishes according to their preference and needs. In view recommended user able to see the recommended dishes and hotels. User is able to comment and rate the hotels and dishes.

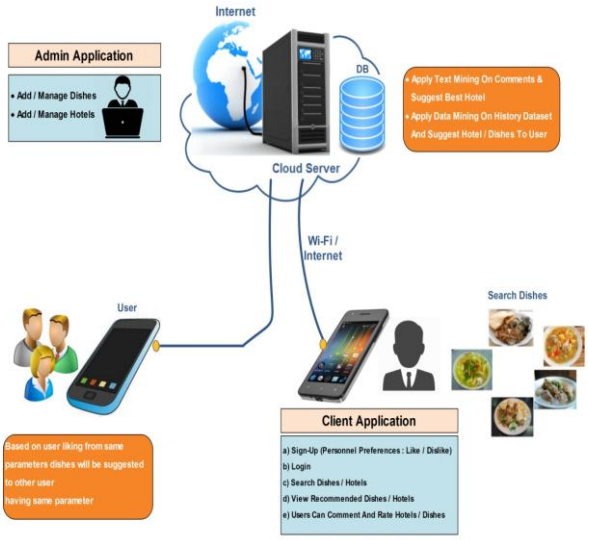

Fig 1. Architecture

B. Advantages

- Fast comment processing, using Hadoop Framework.
- Using navies Bayes dish suggestion will work more accurate.
- According to user likings and comments ,the sorting dish order can be done.

C. Flow Chart

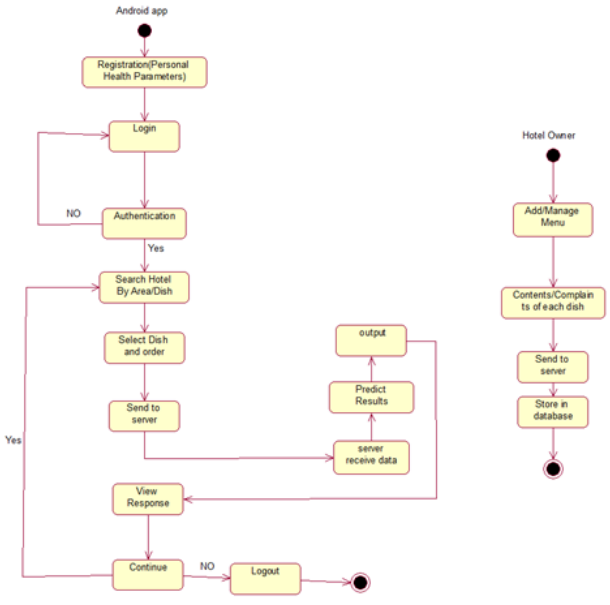

Fig 2. Flow Chart

V. MATHEMATICAL MODELS

The mathematical model is a description of a system using mathematical concepts and languages. For system explanation and study the different components effects, mathematical is used.

A. Set Theory:

Let s (be a main set of) ≡ {SDB, LDB, C, A, S, MR, AO}
where,
SDB is the copy of the server database. This database is responsible for storing user information related to cloud interactions.

LDB is a set of local database that a user owns. It consists of data tables having data items related to the products and their sales transactions.

C is a set of all clients using the server database and mining services from the server. And (c_1 , c_2 , c_3, ...c_n) Є C.

A is a set of algorithms applied on the input data to get mining results.

S is the server component of the system. The server is responsible for registering, authenticating and providing associations to the end user.

MR is a set of mining rules that are applied on the input dataset provided by the client from his LDB. And (mr_1 , mr_2 , mr_3, ...mr_n) Є MR

AO is a set of associations that are extracted from the input and a form the output of the system.

Functionalities :

SDB' = RegisterUser(uid, password, fullname, address, country, contact, email);

password = SHA1(input_password);

U = AuthenticateUser(uid, password, SDB');

LDB1 = ManageProducts(pid, product name, cost);

LDB2 = ManageBilling(transactions, items);

LDB = LDB1 + LDB2

ED(Encoded data) = EncodeTransactions(LDB2, EncodingAlgorithm(EA));

UPLOAD(ED);

AO = Apply Mining(ED);

Results = Decode(Download(AO));

VI. RESULT OF PRACTICAL WORK

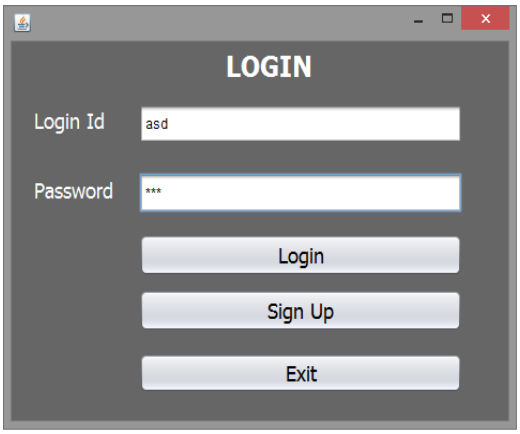

Fig 3.Login and Sigh Up form for Owner

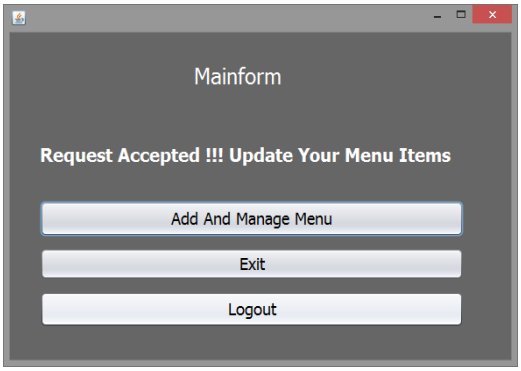

Fig 4.Main form

Fig 5. Menu Item Add

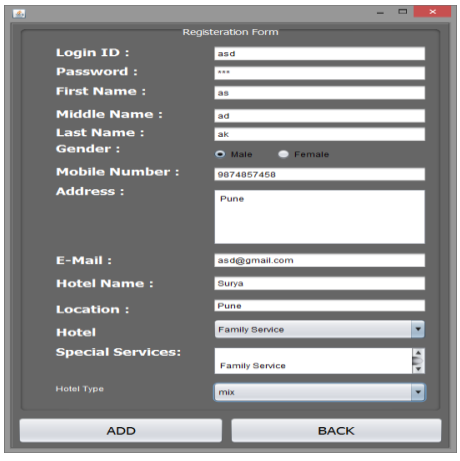

Fig 6. Registration Form

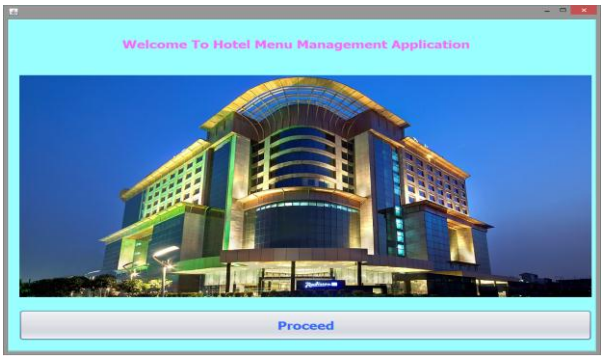

Fig 7. Welcome Form.

Admin Application

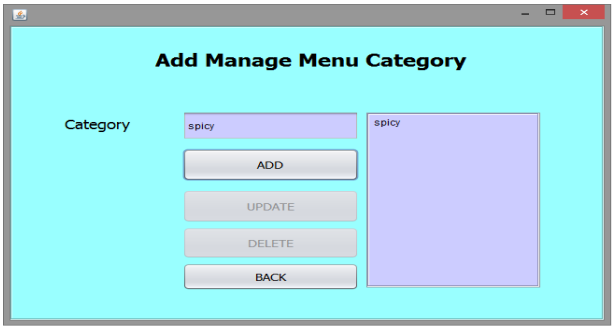

Fig 8. Add Manage Menu Category like Dishes and Hotels

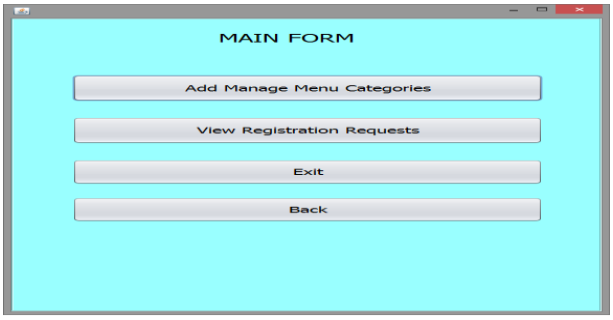

Fig 9. Main Form for Add manage menu category

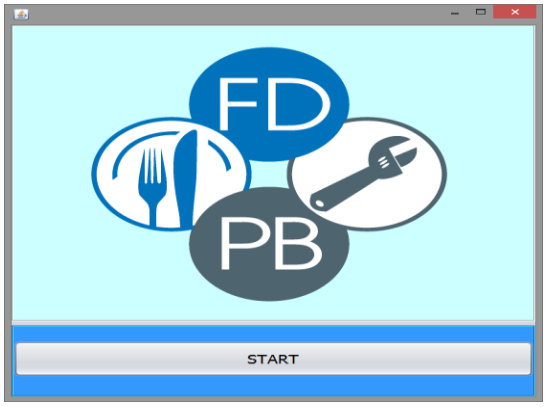

Fig 10. Start screen

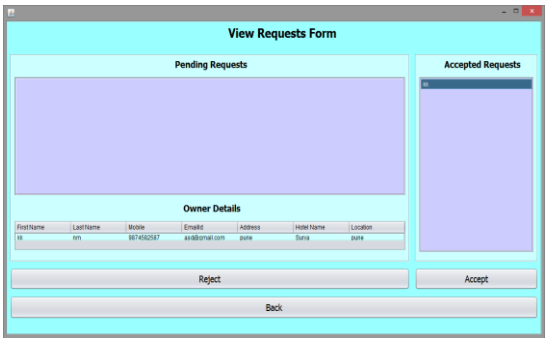

Fig 11. View request Form

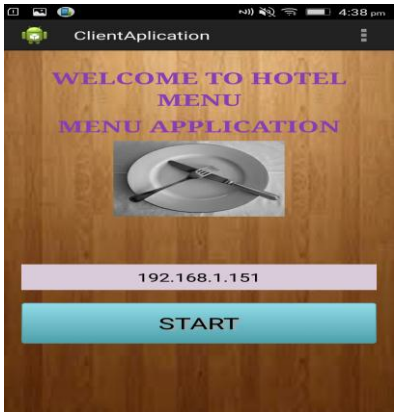

Fig12. Client application start screen.

Fig13. Client Application login screen

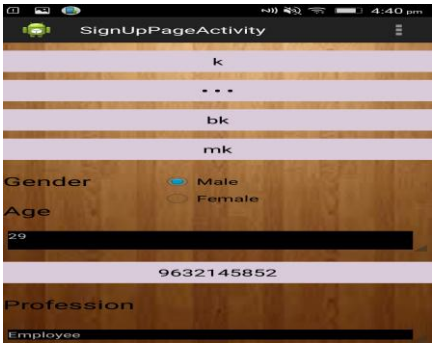

Fig14.Sign Up screen

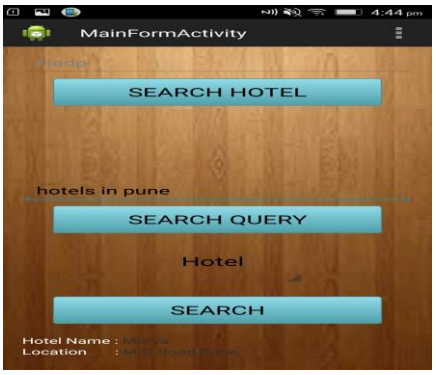

Fig15. Main Form Activity

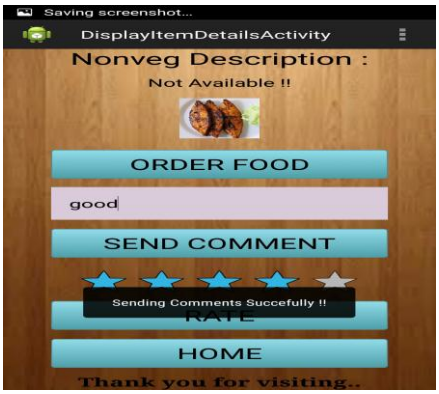

Fig.16. Display Item Details Activity

VII. CONCLUSION

In this paper, we have proposed a keyword-aware service recommendation method, named KASR. In KASR, key-words are used to indicate users' preferences, and a user-based Collaborative Filtering algorithm is adopted to generate appropriate recommendations. More specifically, a key-word-candidate list and domain thesaurus are provided to help obtain users' preferences. The active user gives his/her preferences by selecting the keywords from the keyword-candidate list, and the preferences of the previous users can be extracted from their reviews for services according to the keyword-candidate list and domain thesaurus. Our method aims at presenting a personalized service recommendation list and recommending the most appropriate service(s) to the users. Moreover, to improve the scalability and effi-ciency of KASR in "Big Data" environment, we have implemented it on a MapReduce framework in Hadoop platform. Finally, the experimental results demonstrate that KASR significantly improves the accuracy and scalability of ser-vice recommender systems over existing approaches.

VIII. FUTURE SCOPE

Advanced data mining Algorithm can be used for more accurate results using sufficient dataset. In our future work, we will do further research in how to deal with the case where term appears in different categories of a domain thesaurus from context and how to distinguish the positive and negative preferences of the users from their reviews to make the predictions more accurate.

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