

DATA MINING FOR MOBILE DEVICES USING WEB SERVICES

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ABSTRACT

The market of mobile devices such as smart phones and PDAs is expanding very fast, with new technologies and functionalities appearing every day. Even if such devices share a common set of functionalities, they run on many different platforms, which makes integration with server applications problematic. Data mining for mobile devices using web services can be exploited in mobile environments. It improves interoperability between clients and server applications independently from the different platforms they execute on. Mobile user wants useful information in short time. Therefore, it is better to mine information so that user will be able to extract relevant data. Data mining for mobile devices is very efficient process to classify data. In this paper, general architecture of proposed methodology is explained.

Keywords - data mining, mobile devices, web services Extensible Markup Language, XML Databases,

I. INTRODUCTION

Analysis of data used for mobile is a complex process that often involves remote resources (computers, software, databases, files, etc.) and people (analysts, professionals, end users). Recently, mobile data mining techniques are used to extract useful data sets. Advancement in this research area arises from the use of mobile computing technology for supporting new data analysis techniques and new ways to discover knowledge from every place in which people operate. The availability of client programs on mobile devices that can invoke the remote execution of data mining tasks and show the mining results is a significant added value for nomadic users and organizations that need to perform analysis of data stored in repositories far away from the site where users are working, allowing them to generate knowledge regardless of their physical location. Aim of proposed work is to improve the mobile data mining techniques so that data retrieval for mobile devices will be faster in efficient mobility management using proper web services.

II. DATA MINING

Data mining is an analytic process designed to explore data in search of consistent patterns and/or systematic relationships between variables, and then to validate the findings by applying the detected patterns to new subsets of data. The ultimate goal of data mining is prediction and predictive data mining is the most common type of data mining and one that

has the most direct business applications. While large-scale information technology has been evolving separate transaction and analytical systems, data mining provides the link between the two. Data mining software analyzes relationships and patterns in stored transaction data based on open-ended user queries.

III. MOBILE COMPUTING

Recent advances in computer hardware technology have made possible the production of small computers, like notebooks and palmtops, which can be carried around by users. These portable computer can also equipped with wireless communication devices that enable user to access global data services from any location. A considerable amount of research has been conducted in mobile database system areas with the aim of enabling mobile (portable) computers to efficiently access a large number of shared databases on stationary / mobile data services. Mobile computing is a basic concept used for this purpose. Mobile Computing is a technology that allows transmission of data, via a computer, without having to be connected to a fixed physical link.

IV. MOBILE DATA MINING

The goal of mobile data mining is to provide advanced techniques for the analysis and monitoring of critical data from mobile devices. Mobile data

mining has to face with the typical issues of a distributed data mining environment, with in addition technological constraints such as low bandwidth networks, reduced storage space, limited battery power, slower processors, and small screens to visualize the results . The mobile data mining field may include several application scenarios in which a mobile device can play the role of data producer, data analyzer, client of remote data miners, or a combination of them.

V.MOBILE WEB SERVICES

Currently Web Services are the most important part of modern scientific world . Their popularity is mainly due to the adoption of universally accepted Internet technologies such as XML and HTTP. The use of Web Services fosters the integration of distributed applications, processes, and data, optimizing the deployment of systems and improving their efficiency. Recently, a growing interest on the use of Web Services in mobile environments has been registered. Mobile Web Services make it possible to integrate mobile devices with server applications running on different platforms, allowing users to access and compose a variety of distributed services from their personal devices [9-11] .

VI. PREVIOUS WORK

Data mining services play an important role in field of communication industries. Data mining is also knowledge discovery in several database including mobile databases. Ashutosh K. Dubey,Ganesh Raj Kushwaha and Jay Prakash ,[1] analyzed different aspects of data mining techniques and their behavior in mobile devices. They also analyzed the better method or rule of data mining services which is more suitable for mobile devices. They proposed a novel CSUA (Create, Select, Update and Alter) based data mining approach for mobile computing environments. Domenico Taliay and Paolo Trunfioz [2] discussed pervasive data mining of databases from mobile devices through the use of Web Services. K. Meena and M. Durairaj [3] introduced a algorithm for datamining . The data mining algorithm used for user moving patterns in a Mobile computing environment is utilized the mining results to develop data allocation schemes in order to improve the overall performance of a mobile system. Data mining relevant to different computing environments has been presented in [4-9] along with the techniques for broadcasting data in mobile computing environments by Yusel Saygin et.al.[10]. In an architecture of PDM framework developed by Frederic Stahl, Mohamed Medhat Gaber ,Max Bramer and Philip S. Yu [11] , the data stream mining process runs onboard the users' smart mobile phones.

VII. PROPOSED ARCHITECTURE

The goal of proposed research is mobile data mining on mobile devices using web services. An architecture for mobile data mining is given in fig 1 .

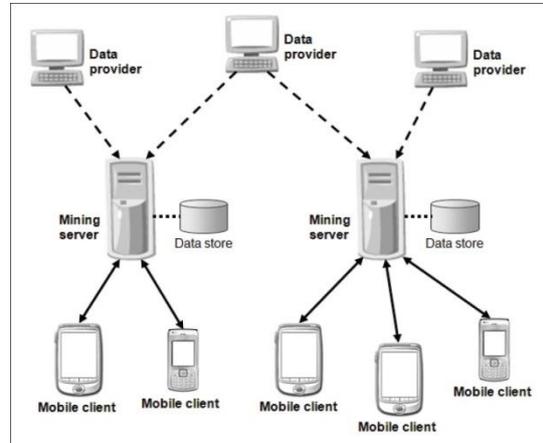


Fig 1. Architecture for mobile data mining
The architecture used in proposed system includes four types of components s follows

- **Data providers** : the applications that generate the data to be mined.
- **Mobile clients** : the applications that require the execution of data mining computations on remote data.
- **Mining servers** : server nodes used for storing the data generated by data providers and for executing the data mining tasks submitted by mobile clients. Data generated by data providers is collected by a set of mining servers that store it in a local data store. Depending on the application requirements, data coming from a given provider could be stored in more than one mining server. The main role of mining servers is allowing mobile clients to perform data mining on remote data by using a set of data mining algorithms. Once connected to a given server, the mobile client allows a user to select the remote data to be analyzed and the algorithm to be run. When the data mining task has been completed on the mining server, the results of the computation would be visualized on the user device either in textual or visual form.
- **Web Services:** Each mining server exposes its functionality through web services like data collection service (DCS) and data mining service (DMS) .

In the proposed work, data provided by the data provider will be given to the Mining server where data mining computations will take place with the help of

Web services . The result of data mining will be provided to mobile client .

VIII. CONCLUSION

Mobile data mining is not yet in a mature phase, however is represent a very promising area for users and professionals that need to analyze data where users, resource and applications are mobile. The combined use of a data mining approach with mobile programming technologies could be used for the implementation of mobile knowledge discovery applications. Data mining of databases from mobile devices would be implemented which will allow remote user to execute data mining tasks from mobile devices.

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