Study of Data Mining Approach for Mobile Computing Environment

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Abstract : **Efficient Data mining Techniques are required to discover useful Information andknowledge. This is due to the effective involvement of computers and the improvement inDatabase Technology which has provided large Data. The mobile Data Allocation scheme is proposed such that the data are replicated statically for traditional Databases' for which themoving patterns of Mobile users to mine the results and improve the Mobile system are used.Data mining services play an important role in the field of mobile communication industry. Data mining is also called knowledge discovery in several database including mobile databases. In thispaper,study of different data mining algorithms in mobile environment is given . Algorithms for maximum moving path,create,select , update, alter is studied .**

Keywords : Data Mining, mobile environment

I. INTRODUCTION

The exhaustive and widespread use of computers and the improvement in Data base technology have provided large Data. The flourishing growth of Data in Databases hasgenerated an urgent need for efficient data mining techniques to discover useful informationand Knowledge. On the other hand the evolvement of network based distributing computingsuch as the private intranet, internet and wire-less Networks has created a genuine demandfor exact techniques of data mining that can bring out the full benefit of such computingenvironments.The innovations in computer science have made it possible to acquireand store enormous amounts of data digitally in databases, currently giga or terabytes in a single database and even more in the future.

Many fields and systems of human activity have become increasinglydependent on collected, stored, and processed information. However,the abundance of the collected data makes it laborious to findessential information in it for a specific purpose. In the late 1980's,the disciplines of knowledge discovery and data mining emerged tohelp survey the information content of data. It is also use in mobiledevices with the use of MIDLET and CLDC component of J2ME. Infew years back, mobile extensions to Grid systems have beenincreasingly proposed in order to support ubiquitous access andselection to the Grid and to include mobile devices as additional Gridresources .In today's scenario mobile devices, such as mobile phones, PDAs,notebook and others, provide a basic building block[3][4][5][6].Finding prevalent mobile user patterns and behavior inlarge amount of data has been one of the major problems in the areaof mobile data mining. Particularly, the algorithms of discoveringfrequent user's behavior patterns in the mobile agent system havebeen studied extensively in recent years. The key feature in most ofthese algorithms is that they use a dataset and frequent Item-Sets visited by the customers.

II. CLDC AND J2ME

The J2ME architecture is described in general before the componentsin the J2ME technology are introduced.J2ME applications are alsodiscussed in general, and it is explained how they are made availableto end users.J2ME is a highly optimized Java runtime environment.J2ME is aimed at the consumer and embedded devices market. Thisincludes devices such as cellular telephones, Personal DigitalAssistants (PDAs) and other small devices. Fig 1 shows the J2MEarchitecture. Java 2 Standard Edition (J2SE) developers should befamiliar with Java Virtual Machines (JVMs) and at least one hostoperating System (OS).

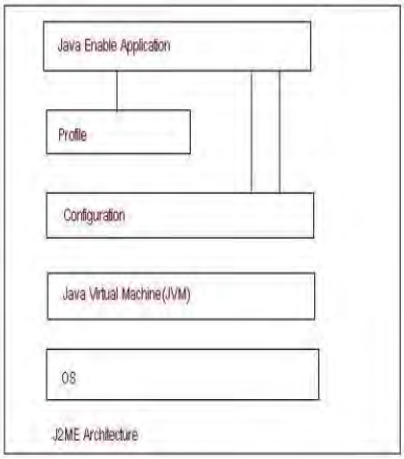

Fig1 J2ME Architecture

A configuration is a specification that describes a Java VirtualMachine and some set of APIs that are targeted at a specific class ofdevice.The Connected, Limited Device Configuration is one suchspecification. The CLDC specifies the APIs for devices with less than512 KB of RAM available for the Java system and an intermittent(limited) network connection. It specifies a stripped-down Javavirtual machine, called the KVM, as well as several APIs forfundamental application services. Three packages are minimalistversions of the J2SE java.lang, java.io, and java.util packages. Afourth package, javax.microedition.io, implements the GenericConnection Framework, a generalized API for making networkconnections.Many J2ME games already exist and enjoy great popularityespecially among young generation. Java comes with the immenserequirement of the object-oriented programming language fordevelopers to implement new mobile applications [7]. Configurationsprovide core functionality and a way to provide greater flexibility butno services for managing the application life-cycle, for driving theuser interface, for maintaining and updating persistent data on thedevice or for secure access to information stored on a network server[8].Fig 2 shows the CLDC position in J2ME Architecture.Several networks have conducted a survey on users' watchingbehaviour which reflects that user behaviour pattern recognition isnot so easy task; we can achieve this by CLDC and MIDPcomponent. Instead of replacing existing TV service, mobile servicesshould be complementary, and offer more interactive means forusers to watch their chosen content. The CLDC component specifiesthe connection between the MIDP profile and the connectingcomponents with the server.

All PDAs are small computing devices that contain an operatingsystem, processor, memory and a port to connect the PDA toperipherals and external computing devices.

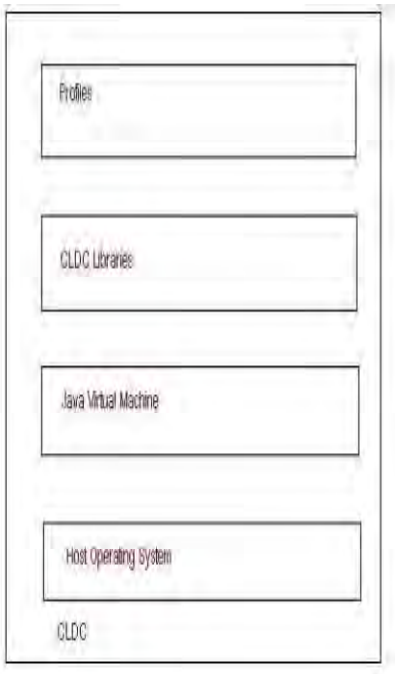

Fig 2 CLDC in J2ME Architecture

III. DATA MINING FOR MOVING PATTERNS IN A MOBILE ENVIRONMENT

In mobile computing environment,generally data is moving fashion .Therefore movement log is generated. Once the movement log is generated, we shall convert the log data into multiple subsequences , each of which represents a maximal moving sequence. After maximal movingsequences are obtained, we then map the problem of finding frequent moving patterns intothe one of finding frequent occurring consecutive subsequences among maximal moving sequences. A sequence of K movements is called a large k-moving sequence if there are asufficient number of maximal moving sequences containing this k-moving sequence. Such athreshold number is called a support in this paper. Note that after large moving sequences aredetermined, moving patterns can then be obtained in a straightforward manner. A movingpattern is large moving sequence that is not contained in any other moving patterns. Procedure for incremental mining of moving patterns:

Step-1:(Data Collection phase) Employing algorithm MM (Maximal Moving SequenceAlgorithm) to determine maximal moving sequences from a set of log data and also theoccurrence count of moving pairs.
Step – 2 (Incremental mining phase). Employing algorithm LM (Large MovingSequence Algorithm) to determine large moving sequences for every w maximal movingsequence obtained in Step – 1, where w is the retrospective factor which is an adjustablewindow size for the recent maximal moving sequences to be considered.
Step – 3 (pattern generation phase). Determine user moving patterns from large movingsequences obtained in step 2, where user moving patterns are those frequent occurringconsecutivesubsequences among maximal moving sequences.In the data collection phase, the occurrence counts of moving pairs are updated onlineduring registration procedure. For purposes of efficiency, algorithm LM is executed to obtain
new moving patterns in an incremental manner for every w maximal moving sequencegenerated, where the unit of w is the number of maximal moving sequences. The selection ofw will be determined empirically. As users travel, their moving patterns can be discoveredincrementally to reflect the user moving behaviours.

IV. ALGORITHMS FOR DATA MINING IN MOBILE COMPUTING ENVIRONMENT

There are different algorithms of data mining which can used in mobile computing environment. Such type of algorithms can be used for creating ,selecting ,updating , altering data set.After analyzing the several aspects of data mining method the picture isclear for any databases it is easy to manage and whenever necessary the repository system can be updated.several data mining techniques can be applied very smoothly becauseour data base is consistent because of limiting redundancy in thedatabase. Finally the J2ME is applied for mobile devices so that we canapply data mining techniques for mobile computingenvironments.

V. CHALLENGES

A number of constraints and technical difficulties faced byresearchers, which are discussed in this section. These generalproblems must be considered for further research in this area topropose new technologies for making mobile computing easier. Someof these are:The screen size of the mobile is a big limitation. The screen sizecan affect the approximate visualization of complex resultsrepresenting the discovered model.Mobile navigation facility is also a big task to achieve andimplement.The experiments on system performance depend almost entirely onthe computing power of the server on which data mining task isexecuted.Techniques and tools can also be implemented in DMS asdecentralized and interoperable services that enable the developmentof complex system such as distributed knowledge discovery suits**.**

VI. CONCLUSION

The innovations in data mining techniques have made it possible to apply data mining in mobile computing environment . If new data mining techiques are applied to data of mobile then it is possible to use mobile data in efficient way.Along with the rapid development of information technology,executing advanced technologies through mobile handset is the primedirection of development. Implementation of intelligent modules onmobile devices through the combination of J2ME and relatedcomputing will be the base to introduce data mining features inMobile Computing.

VII. REFERENCES

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