

Mobile Multimedia System Approach for Development of Mobile Applications & services with Data Visualization

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Abstract -The basic of computing and communication device such as mobile phones, PDAs, certain other hand held devices known as integrated, battery-operated devices, which is small & enough to carry with us all the time. This device containing variety of multimedia services and communication capabilities and adapt to various operating conditions in an efficient way. The use of real-time multimedia data types like video, speech, animation and music significantly improve the usability, quality, productivity, and enjoyment of multimedia systems. Multimedia applications require the carrying of multiple synchronised media streams. Some of these streams (typically video streams) have high bandwidth and stringent real-time requirements.

The objective of this paper is to investigate important issues in mobile multimedia system approach for development of mobile computing with the help of data visualization.

Keywords- Mobile Multimedia System, Data Visualization, Mobile Computing.

I. INTRODUCTION

The communication channels contribute a significant amount of the total energy consumption of a typical mobile system. The objective behind the design of such type of device may be the utility & convenience. The amount of data available nowadays to scientists, engineers

and business managers is vast.

Almost all of this data is available electronically, stored in databases and commonly connected via computer networks, intranets or the Internet. Mobile Multimedia applications also include a major amount of user interaction. Mobile multimedia system is a

computer based communication system that delivers heterogeneous and compressed/encrypted content such as text, audio, video, and graphics from storage devices and transfers it over a heterogeneous channel such as internet, wireless network and local area network to end user while maintaining perceptual integrity. This is shown in figure 1.

Multimedia applications & services, that control the growth in mobile computing, which depends on the availability of a flexible broadband wireless infrastructure. The design of multimedia applications depends on mobile environment, which having number of special characteristics [1]. Such as

- a) *High memory bandwidth* – Many multimedia applications involve huge memory bandwidth for large data sets that have restricted locality.
- b) *High network bandwidth* – Streaming data – like video and images from external sources – requires high network and I/O bandwidth.

The wireless network evolution has allowed that the handset technology provides a broad and new set of applications to their users. Several of these applications require DBMS solutions that support their operations.

A Mobile Multimedia Database Management System is a set of programs that helps Multimedia to store, modify, and extract information or data from a database. The search for knowledge in data is not a new idea, but was of interest even when data was stored in non-electronic form. Examples for pattern finding tools in electronic data sets that have been developed in the past are query functions of data base management systems [4]. It can be describe as below:

A. Object-oriented Database

In object-oriented database, having static structure, dynamic behaviour and constraints of the object into a class, each class defines the Corresponding properties, methods and constraints, the nature of the package in the class. Method, that a single operation, the objects linked by message. The relationship between various types of inheritance makes form the network the object-oriented data model to a directed acyclic graph.

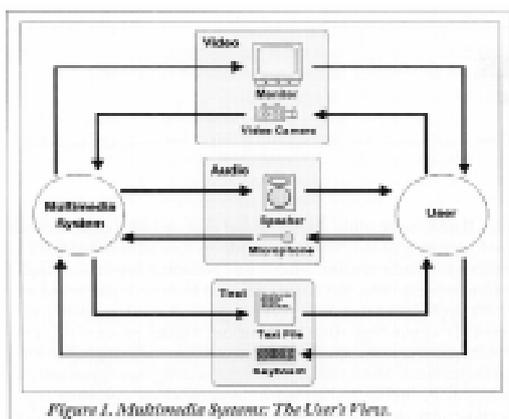


Figure 1. Multimedia System: The User's View.

B. *A Variety of Property Support and Maintenance of Semantic Information*

This is essentially required to support multimedia database systems abstract data types. Maintain the semantic information of multimedia data, a good way to structure that contains semantic information of the class attributes and operation method of the structure.

C. *Support the Feature Spread*

This increases the inner energetic contact management data, the appearance of complex data objects stronger and can better support a mixture of non-conventional database application. Performance has more advantages and potential, so more appropriate for the structure of multimedia data mode.

D. *The Method of Object-oriented Modelling of Multimedia Database*

Integration of structural and semantic information in a model of a complex object is a very important step in the design of a multimedia database. Business Intelligence is a process for extracting, transforming, managing and analyzing large data; by make a mathematical model to gain information and knowledge to help make decisions in the complex [5]. A single control structure is integrated in the composition of the object [2].

The Mobile component has two main functions:

1. Send messages across multi platforms to one or multiple users.
2. Allow two-way communication, authorizing users to use the same channels to create, modify or delete triggers, by using the Message Distribution and Notification modules respectively.

This can be done only with help of Data Base Management system [3].

The surrounding environment to remain "connected" by the Mobile Multimedia System and continuously. Today's new generation enjoy the Mobile Multimedia System's activity as they busy in, be it sports, entertainment, or work. Such type of Mobile Multimedia System - computing environment will allow everyone permanent access to the internet anytime, anywhere and anyhow. New generation can make network services more personalized, adaptable, interactive and useful. A mobile object data management structure used for location improved applications, which consists of a data collector, a context manager, a knowledge base, an inference engine and mobile object databases [3].

Mobile Multimedia systems design approach are classified in to two types

a) *Horizontal Mobile Multimedia Systems:*

This is a flexible to an extensive range of users and organizations for retrieving the data from the devices,

Example: E-mail, browsers and file transfer applications.

b) *Vertical Mobile Multimedia systems:*

Vertical Mobile Multimedia systems are precise to a type of users and organization. For example: financial applications, such as money transfer, stock exchange and information enquiry; marketing and advertising applications emergency applications to check real-time information from government and medical databases and utility companies applications used by technicians and meter readers. In view of quick developments and usage with mobile devices are required to improve the software design approach for vertical applications for better outcome [5].

II. MANAGING MULTIMEDIA INFORMATION IN DATABASE SYSTEMS

Multimedia databases are mainly managed in a two types of data model which is relational architecture and object-oriented architecture. In multimedia databases queries and operations will not done in any data, in multimedia databases browsing is an important concept. Standard indexing approaches do not work for content-based queries of multimedia data. Database architectures have changed, but no existing database system contains all the advanced options that are optimal for visual information retrieval. There are at least 3 commercial systems for visual information retrieval and several commercial database systems at various levels on the object-relational scale that manage multimedia information at an acceptable level [14]. Design of mobile multimedia System requires a collective approach that includes

- A. Standardization of data mining languages
- B. Data pre-processing
- C. Complex objects of data
- D. Computing resources
- E. Web mining
- F. Scientific Computing
- G. Business data

A. *Standardization of data mining languages*

There are various data mining tools with different syntaxes, hence it is to be uniform for making suitable of the users. Data mining applications has to concentrate more in equivalence of communication languages and flexible user communications.

B. *Data Pre-processing*

To recognize useful novel patterns in distributed, large, complex and temporal data, a data base management technique has to evolve in various stages. The present techniques and algorithms of data pre-processing stage are not up to the mark compared with its importance in finding out the novel patterns of

data. In future there is a great need of data mining applications with efficient data pre-processing techniques.

C. Complex object of data

Data mining is going to break in all fields of human life, the presently available data base management techniques are limited to mine the usual forms of data only, and in future there is a potentiality for data mining techniques for complex data items like high dimensional, high speed data streams, sequence, noise in the time series, graph, Multi-instance objects, Multi-represented objects and temporal data.

D. Computing Resources

The high speed internet connectivity has posed a great demand for novel and efficient data mining techniques to analyze the massive data which is captured of IP packets at high link speeds. Network based data mining has to focus on address the data privacy, security and governance.

E. Web mining

The enlargement of World Wide Web and its usage grows; it will keep on to produce ever more content, formation, and usage data. Extracting process models from usage data, understanding how unlike parts of the process model impact various Web metrics of interest, how the process models change in response to various changes that are made-changing stimuli to the user, developing Web mining techniques to improve various other aspects of Web services, techniques to recognize known frauds and intrusion detection.

F. Scientific Computing

In recent years Data Base Management system has attracted the research in various scientific computing applications, due to its efficient analysis of data, discovering important new correlations, patterns and trends with the help of various tools and techniques. Data Base Management system- environments plays major approaching developments in scientific computing will require a new class of techniques proficient of dynamic data analysis in faulty, distributed framework.

G. Business Data

Business Data Base Management system needs more enhancements in the design of Data Base Management system techniques to gain significant advantages in today's aggressive global market place (E-Business). Data base management systems make

possible support for new information requirements. The Data Base Management system techniques hold great promises for developing new sets of equipment that can be used to provide more privacy for a common man, increasing customer satisfaction, providing best, safe and useful products at reasonable and economical prices, in today's E-Business environment [6].

III. MOBILE MULTIMEDIA DATABASE SYSTEM

Mobile computing involves mobile communication, mobile hardware, and mobile software. Communication Mobile embedded systems evolve into data centric and multimedia-oriented applications, storage with high performance and huge capacity has become necessary. Because of its versatile features DBMS used in mobile multimedia for security, ease of maintenance, reliability, availability and performance [7] [8].

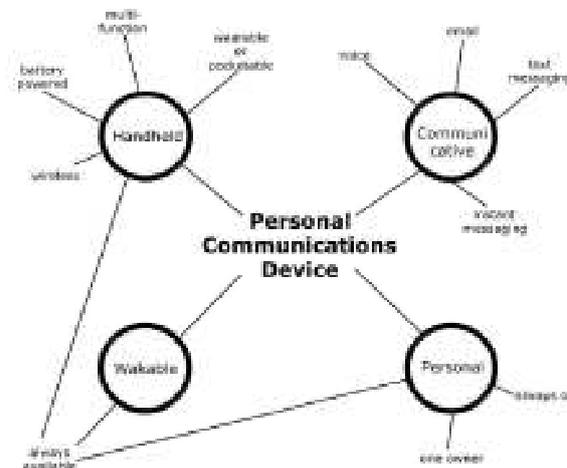


Figure 2: Design of Mobile Multimedia

Wireless data connections used in mobile computing take three general forms. Cellular data service uses technologies such as GSM, CDMA or GPRS, and more recently 3G networks such as W-CDMA, EDGE or CDMA2000 [9].

Data management and access on mobile devices is central to mobile applications. As mobile applications achieve widespread adoption in the enterprise, mobile and embedded DBMSs – needed to support such applications become an important part of the IT infrastructure. And as these applications grow more disconnected and sophisticated with increasing data sizes the need for rich data processing capabilities increases [12].

Database Management Systems represent a controlled set of data with the programs which are supportive for the definition, formation, storage, access, and querying of database. Multimedia Database Management System lies under multimedia information systems. A multimedia DBMS maintains multimedia data types, and provides services for the

multimedia database creation, storage, access, query, and management. These are used when we have to deal with a huge amount of multimedia data objects of different types of data media [10].

A multimedia Database Management Systems must provide basic functions of DBMS:

A. Data independence

It is known as the type of data transparency that matters for a centralized DBMS. It is used for immunity of user applications to make changes in the meaning and club of data.

B. Data modelling

It is a process used to define and analyze data requirements required to carry the business processes within the range of equivalent information systems in organizations.

C. Data Creation

It is depends on concept such as to make a new database, table, index etc. It is efficient & effective technique in DBMS system.

D. Data organization

It describes the central characteristics of organizations. Commonly it is used for firms and enterprises.

E. Data retrieval

It involves extracting the required data from a database system. There two primary forms of the retrieved data are information and queries. This kind of data may be stored in a manner of hard copy or soft copy.

F. Data Access

It is refers to software and activities related to storing, retrieving, or acting in Database Management Systems. Normally data access content in different and incompatible formats & it is used for standardized languages, methods, and formats.

IV. APPLICATIONS OF MOBILE MULTIMEDIA SYSTEM

Database Management Systems technology in general is mandatory, because a multimedia database management system is a framework that manages multimedia data. The optimal Database Management

Systems for mobile database reduces the hardware requirements. Specific requirements of mobile database applications exist at several levels of a DBMS. For instance, some applications need query processing. In other applications encryption of stored data is needed, which could be performed transparently by the DBMS. Further examples are transaction support, synchronization with a central database and support for special data types (e.g. geographical objects) [13] [15]. If the device offers different types of storage, e.g. Flash ROM or a Micro-drive, specific adaptable access modules could increase the performance and reduce the power consumption at the same time. Most applications do not use the whole, but a reduced, varying function set. This kind of applications can be supported by a general purpose database management system which is heavyweight, feature-laden and costly in installation and maintenance, or otherwise by a lightweight, customized system. On lightweight appliances the resource requirements forbid the use of general purpose DBMS [11].

The set of modules must be small but applicable to a broad range of DBMS appliances. A highly different application of mobile multimedia system needs many varying functions in all layers of a DBMS, on that basis DBMS applications can be distinguished between two different fields:

A. Personal information management

The amount of data on the mobile device is usually small, and is at most edited on the mobile device itself. The main challenge for mobile databases for personal information management is flexibility.

B. Replication of large databases

The replication of large databases or parts of them – large in the context of mobile, lightweight appliances, e.g. not more than 1 GB – is characterized by the cooperative use of the same data by many users. Data are mainly managed and manipulated by DBMS on stationary servers, only a few or no changes are performed on the mobile device. Business applications, geographic information systems or multimedia are typical applications [11]. Storing and managing the structure of all multimedia objects, as well as some of the objects themselves in an object database, and providing strong links from this DBMS to the particular servers (e.g., image file systems or video-on-demand systems) that store the remainder of the data [10].

V. ANALYSIS AND DISCUSSION

Data Visualization plays significant roles in exploring, analyzing, and presenting scientific data. The components of data visualization can exist in different types of systems involving different technologies, databases, and data structures. The field of information

visualization has emerged "from research in human-computer interaction, computer science, graphics, visual design, psychology, and business methods. It is increasingly applied as a critical component in scientific research, digital libraries, data mining, financial data analysis, market studies, manufacturing production control, and drug discovery". The value of data visualization is measured based on effectiveness and efficiency. Generally visualizations used for better understanding specific problems, to solve them and to take better decisions in less time.

Data Visualization is most powerful techniques of visual analysis, which involves the real-time display of several graphs, which is either different subsets of data taken from a larger data set, or different views of a shared data set.

In object-oriented databases data is defined as a class and each class contains the Corresponding properties, methods and constraints. In case of multimedia databases we can use various types of data such as text, audio, video and graphics and emphasize on enhanced scientific methods and tools for solving problems.

Data Visualisation in mobile devices describes mobile-wireless systems and assured the new challenges faced by mobiles devices on the basis of data modelling. The mobility management software designs to improve the flexibility in transferring and processing the information from one location to another location.

The approach of web mining is that it stimulates the visual data mining and pattern recognition in large-Scale multidimensional datasets. Software for mobile devices must especially consider the limitations (e.g. less memory, small display size, limited power supply) of the mobile devices.

The different data visualization techniques hold great promises for developing new sets of equipment and services that can be used to provide more privacy for a common man, increasing customer satisfaction, providing best, safe and useful products at reasonable and economical prices.

VI. CONCLUSION

Mostly the application & services depends on new ideas & Technology. The demand of the user responsible to grow the several types of application & services which is depends on Database Management Systems represent a controlled set of data. To developed Mobile multimedia help out local communities to share resources using geo-location, interactive mapping, increased reality, and several data representations. Mobile devices can freely move around anywhere in the world, while still connected to the network. This provides greater flexibility in

accessing information anywhere at any time. For improving more flexibility on mobile devices, the new challenges in designing software systems for mobile networks include location and mobility management, channel allocation, power saving and security.

In recent years Data Base Management system has attracted the research in various scientific computing applications, due to its efficient analysis of data, discovering important new correlations, patterns and trends with the help of various tools and techniques. Mobile multimedia presents a new class of application in computing that is quite different from the business and scientific application. The visualization tools are used to show how the system and algorithm choice impact the resulting media product and result in variable run times.

Data base management techniques are limited to extract the usual forms of data only. In future there is a great need of mobile multimedia database management system applications with efficient data pre-processing techniques.

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