ARPN Journal of Science and Technology

http://www.ejournalofscience.org

Location Based Reminder Using GPS For Mobile (Android)

[1] Priyanka Shah, [2] Ruta Gadgil, [3] Neha Tamhankar
Department of Computer Engg, Smt. Kashibai Navale, College of Engineering
Pune, Maharashtra India
[1] priyanka27.in@gmail.com, [2] ruta.gadgil@gmail.com, [3] nehatamhankar.1311@gmail.com

ABSTRACT

Although location-based reminder applications have been widely prototyped, there are few results regarding their impact on people: how are they used, do they change people's behavior and what features influence usefulness the most. Cell phones provide a compelling platform for the delivery of location-based reminders within a user's everyday natural context.

We present requirements for location-based reminders resulting from a qualitative study performed at small area in the city, and elaborate how these results are influencing ongoing design of a more comprehensive location-based reminder system. In this paper we propose an architecture of location based services which uses GPS. Within the architecture, we discuss the challenges for context management, service trigger mechanism and preference-based services.

Keywords: *LDK (Location Distance Keyword), GPS (Global Positioning System), LBS (Location Based Services)*

1. INTRODUCTION

The main purpose of location-based services is to provide services to customers based on the knowledge of their locations. Examples of these services include real-time traffic information, digital map services which are delivered to mobile terminals according to user's location to minimize data transmission, providing dynamic guidance services according to the users' location and current traffic condition; requesting the nearest business or service(e.g., the nearest restaurant or cinema) and location based advertising (like "Send e-coupons to all cars that are within two miles of my gas station").

Unfortunately the current state-of-the-art location based services are rigid as they cannot make good use of information. Services are provided at inappropriate time without considering user's intention and changing environment. Also services are rigid as processing completely isolates various forms of user "preferences".

For example, cellular phones can now be used to carry not only voice but also data traffic, such as text messages, pictures, and video clips from anywhere at any time. Cell phones now emulate computers, with enhanced graphical user interfaces, integrated Global Positioning Systems, wireless data connectivity, efficient batteries, powerful central processing units (CPU), and expanded storage capabilities. Advanced communication protocols, databases, and software development environments ensures these end-system devices are connected to wireless cellular networks and can interact with many hosts and servers via the Internet. Similarly, hardware independent programming languages allow the development of applications that can run on any of these devices and exchange information to and from other clients, servers, and specialized databases. This generalized concept facilitates transportability of developed software across different devices and networks, which is a necessity for the rapidly advancing market of wireless communications.

In this paper we raise the challenges and propose architecture to enable practical realization of location-based services. Then we further illustrate the key issues in the architecture and discuss corresponding solutions. The main idea of the architecture is to embed various information in service trigger mechanism and service itself. For example, dynamic route guidance service which ensures user to arrive at destination in the shortest time need to adjust previous route according to the traffic condition. Also in reminder services, the service needs to decide whether or not to post the message to user according to user's location, incident property.

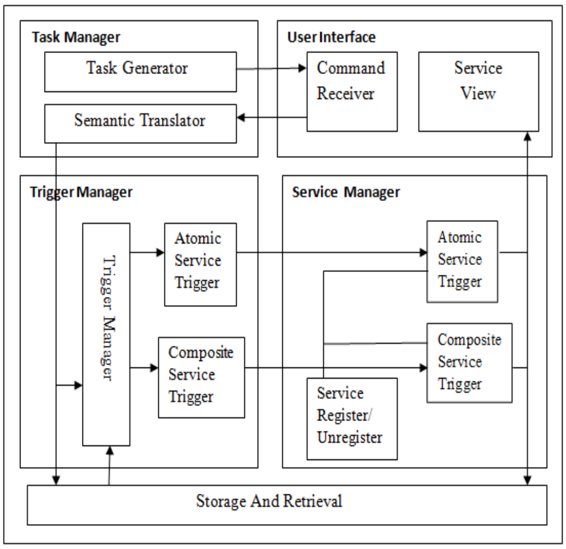

Fig 1: System Architecture

ARPN Journal of Science and Technology

http://www.ejournalofscience.org

2. SYSTEM ARCHITECTURE

Figure 1 shows the system architecture. It can be divided into five parts which are task management component, user interface component, trigger management component, service management component, and storage and retrieval management component. The work flow of this architecture is shown as follows:

1) User interface component receives available task list from task generator in the task manager component when the system is initialized.
2) As user issues a task, the command receiver will dispatch it to the semantic translator to get task relevant information.
3) The semantic translator translates the task and then store related information to the database and calls trigger manager.
4) The trigger manager collects all kinds of context information to decide whether or not to start the service related to the task. (It might be atomic or composite).
5) When service starts; it will get all related content information to provide personalized services.
6) When changes occur in the database, it evaluates module, detect and decide whether there is a need to do reasoning. The evaluation result of content reasoning will be stored to database as a kind of advanced content information.

As can be seen in the picture the system contains composite services which are composed by a set of atomic services. It can dynamically change by service register and unregistered at runtime. For example navigate service contains voice reminder service, digital map service, dynamic route guidance service, speed alarm service. The voice reminder service and speed alarm service can be added or cancelled according to user's demand.

2.1 BACKGROUND AND RELATED WORKS

a. GPS and Google Maps

With location positioning system such as GPS becoming popular, there is a growing demand for location-based applications. It is easier, these days to utilize map information by connecting GPS receiver to PC and PDA. Corresponding to this momentum, GPS receivers are now embedded into mobile phones and applications using the location of the user in real-time are widely available. GPS chips are now included in many devices to analyse satellite signals and determine the user's location with high accuracy. In a large social event, such as a big conference, since people come to communicate with each other, they are more likely to release their location information and the location privacy is not an essential concern. In addition, people usually need to register to join a conference so a location server can easily get the participants' profiles. Hence, the server-centric mode is an economic way to handle location detection for big conferences. One of the key technological advances for the development of location-based applications is the use and availability of positioning systems.

b. Location Based Services

Location Based Service (LBS) LBS is mobile service that has the capability to provide real time information based on the user's location. Geographical Information System (GIS) has been the heart of LBS in order to provide all the functionalities in LBS. First, we may send location information to remote parties. This set of services are commonly used today, e.g., in location tracking applications. Second, use location information to make communication decisions, e.g., a user agent may automatically disable instant messaging when driving. Third, location changes can trigger communication actions, e.g., when a person's user agent gets a location notification indicating the person enters a room, the user agent may automatically turn on the light of the room. Sending location information to remote parties for location tracking Locations are usually represented in geospatial coordinates or civil addresses for tracking. By enabling to upload real time location and to create the content "on the spot", we can expect more variety of location-based services.

c. Reminders as Per Situation

Different locations may require different communication behaviours. For example, video or text conversation is not good when driving. User agents usually based on location attributes, instead of geospatial coordinates or civil addresses, can choose appropriate communication behaviours.

d. Triggering Actions

User agents may invoke actions when detecting location changes. Location changes can be in an incoming location notification from a location server or retrieved through locally connected location sensors. Actions: triggered by user's own location changes: For example, when a user drives on the way to his office, his user agent may get a location notification and automatically turn on the air-conditioner in his office. Another example, when a user moves from one location to another, his user agent may transfer the on-going media session to the user's new location. For this set of services, users subscribe to their own location information. There is no authorization needed. Actions triggered by remote parties' location changes: For example, in a day care centre, when a child leaves the playground, the teacher may get called. For this set of

VOL. 2, NO. 4, May 2012 ISSN 2225-7217

ARPN Journal of Science and Technology

http://www.ejournalofscience.org

services, users subscribe to others' location information and need to get authorization for acquiring the location information.

3. PROPOSED SYSTEM

Proposal of an integrated android application based on location information

The discussion in the previous section motivates us to adopt the design principle that the following functions are realized "on the spot":

(1) Creating and editing event content,
(2) System to upload location information,
(3) Search function using location information of the user, and
(4) Displaying search results on the screen.

Overview and structure of the proposed system

The structure of the proposed system is shown in Fig.2.

The mobile phone on the user side is first connected to the operator's network and accesses the web server via the Internet. The operator's network provides several functions such as a WAP proxy to translate XML to WML for WAP browsers or the java official server to download approved and clean java applications.

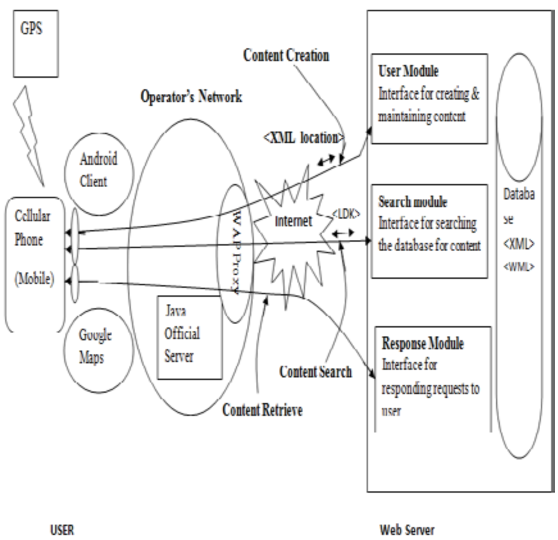

Fig 2

The proposed web server will consist of the following:

(1) User module to create and store contents,
(2) Search module to search the content database,
(3) Response module to respond to requests from the client for web contents.

On the other hand, the user access the web server with the mobile phone equipped with location information acquiring function, a java virtual machine and a WAP browser. Data exchange between the user module on the server side and the Java client on the user side is conducted in XML format. The user module translates the XML format to the WML (Wireless Markup Language) / CSS (Cascading Style Sheet) format for the mobile phone to browse, and store both formats in the database. The search module provides a function to use the location of the user and a geographical range as a search condition in addition to keywords in text format. The response module obtains the requested web content from the database, and transfers it to the mobile phone in the WML format. The structure of the functional modules in the proposed system is shown in Fig. 3. We propose to use "apache" for the web server, MySQL for the DBMS and PHP for coordinating both entities. Also, we use J2ME for java application runtime environment on the mobile phone, MIDP, which is a profile for a mobile phone and KDDI-P, which is a profile provided by KDDI for GPS functions. For the communications between the Java client or the WAP browser on the client side and the web applications on the web server side, HTTP is supported and used.

a. Structure of the client side

The main module handles the registration procedure for opening a user account. The builder module accesses the user module on the server side and also sets up the location information. The drawer module provides a web editor function, which is the interface for making content using the mobile phone operating buttons. Created web content is stored in the XML format. The query module provides form for content search. The data module controls data access inside the mobile phone. This makes it possible to access data and also to capture location information using GPS. To avoid accessing the server every time the user makes and renews content, new content is kept in the cache inside the mobile phone. When making content, the information in this cache is first surveyed, and if the data is not stored there, the server is then accessed. Accessing the data folder inside the mobile phone, obtaining location information or cache information and the HTTP transfer function are performed by the Java client program via the APIs provided by J2ME. These types of information are solely managed by the data module, which bridges them to the main module, builder module, drawer module and query module. When the user requests date to create content, the request is received by the builder module, and handed to the data module. The data module first searches the RMS (Record Management System) provided by J2ME to see if stored in the cache. When no corresponding information is found, the data module obtains the necessary information from the web server by using HTTP transfer.

ARPN Journal of Science and Technology

http://www.ejournalofscience.org

b. Structure of the server side

The proposed system consists of a series of procedures for translating and storing content on the server side. XML content sent from the client is distinguished by the subscriber ID, which is attached to the HTTP request header. It is then translated into WML and stored in the database to support WAP browsers. Content information from the user is also stored in the search database. For the search method, we use two functions, keyword and search range measuring from the user location. By showing the result that meets these two functions, the web content can be selected.

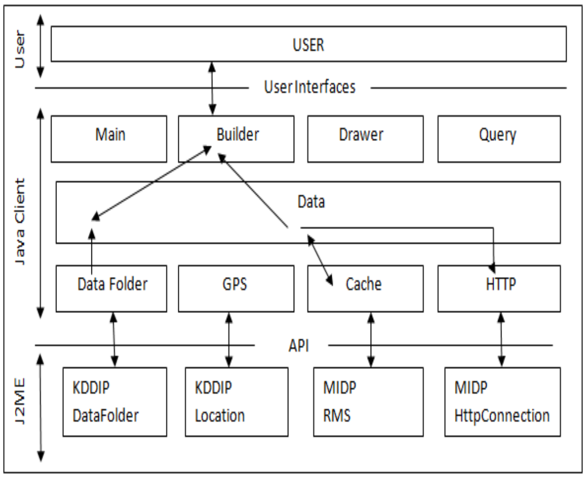

Fig 3

4. CONCLUSION AND FUTURE WORK

In this paper, we discussed about system architecture and its work flow. We realised one application based on location based information. We summarize and categorize different location-based communication services. Location information gets used more and more often in people's daily life. This paper focuses on communication related location-based services, GPS and system Architecture. In Internet telephony systems, communication services can be enhanced by the integration of other Internet services, such as email, web, and network gaming, which also involve location information handling. In Future we can extend this with context based information and their preferences. restaurant queries, traditional restaurant queries only consider the distance, while we aim to change to provide better results by considering not only distance but also user preferences (e.g. prices, restaurant rating, and dietary restriction, history selection etc.), environmental context (e.g., time, weather and current traffic condition etc.) and restaurant context(current waiting line, closing time etc.).

REFERENCES

[1] Yigal Bejerano, Israel Cidon, Efficient Location Management Based on Moving Location Areas at ieee infocom 2001

[2] Sean J. Barbeau, Miguel A. Labrador, Philip L. Winters, Rafael Pérez, and Nevine Labib Georggi, A General Architecture in Support of Interactive, Multimedia, Location-Based Mobile Applications in IEEE Communications Magazine November 2006

[3] Xiaotao Wu and Henning Schulzrinne, Location-based Services in Internet Telephony ieee in 2004

[4] Tongyu Zhu, Chen Wang, Guannan Jia, Jian Huang, State Key Laboratory of Software Development Environment, Toward Context-Aware Location Based Services, 2010 International Conference on Electronics and Information Engineering (ICEIE 2010)

[5] Almahdi Mohammed Ahmed1, Azuraliza Abu Bakar2, Abdul Razak Hamdan3 Dynamic Data Discretization Technique based on Frequency and K-Nearest Neighbour algorithm, 2009 2nd Conference on Data Mining and Optimization,27-28 October 2009, Selangor, Malaysia

[6] Kevin A. Li, Timothy Sohn, William G. Griswold, Evaluating Location-Based Reminders, ieee paper

[7] Ahmad Haris Abdul Halim, Maizatul Akmar Ismail and Sri Devi Ravana, Integration between Location Based Service (LBS) and Online Analytical Processing (OLAP): Semantic Approach, Journal of Information Systems, Research & Practices, Vol.1(1)

[8] Misato Sasaki,Christian Noack, Hidetoshi Yokota, Akira Idoue , KDDI R&D Laboratories, Inc, LocationWeb: Proposal and Implementation of Location-based Web Content Search and Creation using the Mobile Phone.