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Massaging Information System (*m*IS) for Mobile Clients about Location Awareness in Pakistan

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Abstract: Mobile Technology now a days is the only field of communication which with the help of vendors, is providing maximum facilities to their clients in every part of life. This piece of work is related to an entirely new idea about service that never has been used in PAKISTAN by any vender of mobile service. We have designed a system through which user can be aware on his/her demand about different locations of different places like hospitals, mosques, shopping plazas, law enforcement agencies points etc on their mobile when they are on move in an unknown locality. We hope this will help mobile users in any situation of emergency and in an time bound environment.. The beauty of system is that it provides information about nearest required location in an specific range of distance with directional guidance.

Keywords: mIS, Localization, LDAP, Directional Range

INTRODUCTION

Now a day with development in technology, Mobile and Wireless Communication is the only field that has rapidly enhanced with its usage, application, devices and more importantly in services.

In Mobile communication the term massaging can mean so many things. Some peoples think it may be an email, some thinks it may text massaging or application to application massaging (J. Ye, *et al.*, 2007). Use of text massaging service with client applications because massaging technology is a great way to tie the applications together. Text massaging provides lots of benefits to both the user and network provider like it guaranteed massage delivery; it is easy to use without additional software or hardware, revenue source for service provider and low cost for information delivery.

This piece of work is conducted on extremely a new idea to provide service to mobile clients (by their vendor) in different categories of emergencies when they are on the way and in unknown environment of locality.

MATERIAL AND METHODS

RELATED WORK

In Literature we found no work like mIS. This contains simple appication implimentation and services to provide, but is the first proposal of its style in research. But little other work related to Mobile tracking Location based Advertisement and with section of marketing is performed (T. Sohn *et al.*, 2005). Recently some work on Health care support is conducted by few mobile companies to provide online medical facility to customers in general (B. Lavelle, *et al.*, 2007). As in Pakistan telenor has recently introduce patient advice system.

*m*IS

mIS (Massaging information System) is a system for mobile users on demand. mIS is a service provided by mobile company to its users. It is IP based service. mIS system is designed of mobile companies for the purpose of providing information to customers at any location and at any time specially when they are on move at any unknown place . It should be on registration bases. User / customer will be registered on request to company or service provider to avail the specific facility of mIS. Our idea is to provide some facilities to the legitimate customers of mobile phone by Mobile Company. Location based mIS has advantage to facilitate them in helping for some common issues related to their daily life routine in an emergency bases (Ferrer-Roca *et al.*, 2004).

Application:

Many applications for mIS can be designed to facilitate clients. Few from those may be about the

information of Health Care, Business and Shopping places, Religious places, Law Enforcement Agency points, Auto mobile service points, fuel filling points etc. For the sake of understanding the mechanism of mIS, her we have taken one application for the purpose of implementation i.e. Health Care.

Working:

For getting the facility of service the client has to be registered with the service provider under the request / registration system for availing the specific facility and customer will be charged for that under terms & conditions of company for the duration and number of facilities required.

1. **Request:**

The basic idea is that at the any route of the city if the user needs any medical facility then he seeks the closest hospital or user faces any unlawful situation then he seeks for any security agency. Depending upon the condition and its requirement, user will send a massage to service provider (Mobile Company) through a specific code no allotted to client requesting for required helping information about hospital or check point/police stations usual as normally mobile companies allot dedicated code numbers to dial or for sms for acquiring specific facility.

2. **Response:**

In response mobile company/ service provider after receiving massage of client will send sms in text format containing the reply of received requested.

To support all this, for design issues authors suggest that *: (i) m*IS is not character sensitive (ii) *m*IS is not spell sensitive (iii) Responded sms of *m*IS will be on the basis of radius of 2.0 kilometers (iv) Responded information will be in four directions (i-e North, West, East, South)

On reception of request from client company will look for: (a) compare the no: of user that is it legitimate registered user? (b) After verification depending upon the form request, it will search for the location of the customer (c) Depending on location of user it will be connected to its database and from its domain it will respond in sms to customer about the nearest position registered for.

Terms and Conditions

i. It should be on Demand by registration.
ii.Information will be provided w.r.t range (up to 2 kilometers) in all directions.
iii.There must be no delay between request and response and request with this code will be access according to priority.
iv.Transmission Security
v.Communication Security
vi.Network Infrastructure Protection
vii.Authentication and Privacy
viii.Few lines should be reserved for this type of service with maximum bandwidth.
ix.System must have the record (Name and Telephone no) of the subscriber.
x.Before providing response information of subscriber should match to the record available at Location Server.
xi.If there is no any information found about subscriber then an appropriate massage should be sent to the user containing information about un authentication of services or as unknown customer.

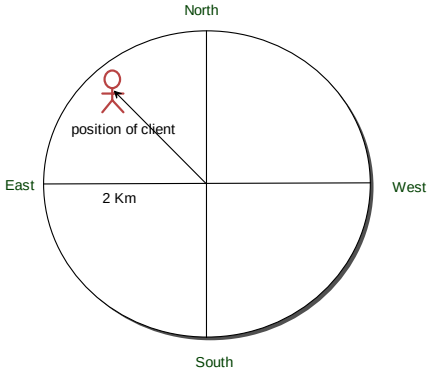

Fig 1: Directional Range of mIS Mechanism

IMPLIMENTATION:

Location based *m*IS is designed to provide scalability and distribution in order to expanding number of users. When user sends the request to his service provider it sends by system control channel. The massage is sent to nearest SMSC which delivers the massage to application server through PLMN (Public land mobile network) containing service gateway over WAP protocol (J. L. Qiu, 2007). The request will be sent to the application server along with user credentials. These user credentials used for the purpose of authentication of the client at location server. If client is registered and all credentials of client matches with its profile record then it records clients current location and send that all information to application server. Then application server communicates with the LDAP (Light weight directory access protocol) server in order to create the list of all hospitals / agencies within the client's cell sector. If there is no any hospital found in all four directions near the client then LDAP Server (L. Leun, 2007) will send

an appropriate massage to the application server. But if any hospital found LDAP Server will provide the addresses of hospitals in all directions along with distance and application server provides reply to the client.

Note: - This is distributed system approach. Response will be provided according to where the user is currently present not where he is registered.

Following are the basic terms used for the purpose of building *m*IS system.

Application Server:

It is a middle ware of the system responsible to perform the user interaction with the services offered by the company. The request of client will sent to the application server through WAP (wireless application protocol). WAP has the ability to convert WML request to XML that is understood by application server. Application server provides the WML response to the client that is understood by client's mobile device. At the time of communication with Location server it generates request in XML format and also receives the response in XML format containing the client's current location information. MPP (mobile positioning protocol) is responsible to make them communicate with each other.

After getting positioning response from location server application server will communicate with LDAP Server. On the reception of request it will be connected to its database to search query. After performing the Query LDAP server returns an LDAP response about required request. LDAP V3 protocol specifications are used to establishing communication between application and LDAP Server.

Location Server:

Location server is a network node that is responsible to record the location of client after performing successful authentication. This communication between location information server and application server will be done through MPP protocol. MPP is basically an interface between the location dependant applications and mobile positioning servers. We can request for the position of client mobile through this protocol.

LDAP Server:

LDAP Server is a directory that hold all the information about hospitals, security agencies etc. LDAP (Bose et al, 2006) protocol used to perform operations on data stored on it. LDAP protocol is hierarchical supported and our database information is also hierarchical. In case if our information model is translated into hierarchical then there will be the need of retrieve the query that is also LDAP supported because of its standardization.

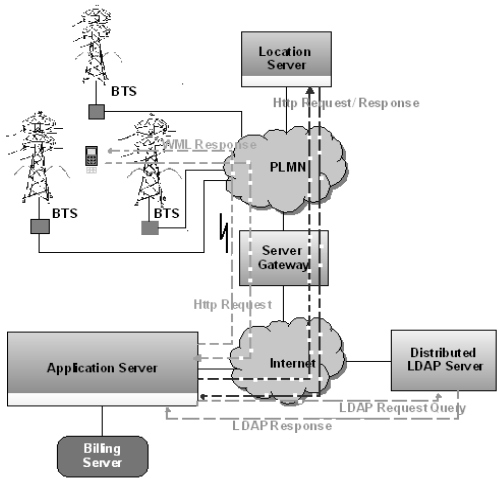

Fig 2: System Architecture

RESULT AND DISCUSSION

DATABASE DESIGN

The system contains a middleware at which several application servers are integrated and they have secure access, authentication, protected operating systems and tracking system at network.

Following are some Main components and their usage on the Network:

Location Identifier:

Finds the location of client by using tracking system or other mechanisms.

Billing:

It collects the charges of registered clients on the bases of time duration and usage of application.

Registration:

It performs the registration and provisioning of applications and services to user.

Geographic Information System (GIS):

GIS stores, edits, displays, handles and captures the data related to locations for purpose of making decisions. It uses digitization technique to convert maps into different formats, traces the area to address them into streets, towns and helps to find nearest areas.

Maps:

it contains maps of different cities for searching guidance.

Subscriber Profiles:

It stores all the personal information (user credentials) of the subscriber. *Authentication Identifier:* It Performs authentication of client after request to check that

either he is registered or not or user credentials matches or not.

Vicinity Search Identifier:

It is used to find the nearest location on the basis of user requirement.

Position Identifier:

It divides maps into sessions in order to find the current position of the client and to search the nearest location to the user

SDK-(Software Development Kit):

SDK contains set of development tools to create the several applications for different frameworks. It also allows integration with the middleware platform if the number of applications expanded.

SMS Format Identifier:

t performs identification of client view SMS formats in internet standard Markup Languages or languages understood by their Mobile Devices such as (WML, XML, HDML, vo XML).

Middleware Adapters:

Adapters are as the interface between Middleware Platform and host network resources, such as SMS centers and Billing Systems, WAP Gateways and Network Management systems, authentication etc

SMS Format Identifier:

It performs identification of client view SMS formats in internet standard Markup Languages or languages understood by their Mobile Devices such as (WML, XML, HDML, voXML).

Security:

The middleware platform handles data security. All application servers are protected behind an integrated firewall to blocking unauthorized connections, handless, "Denial of services" and protects from the Hackers.

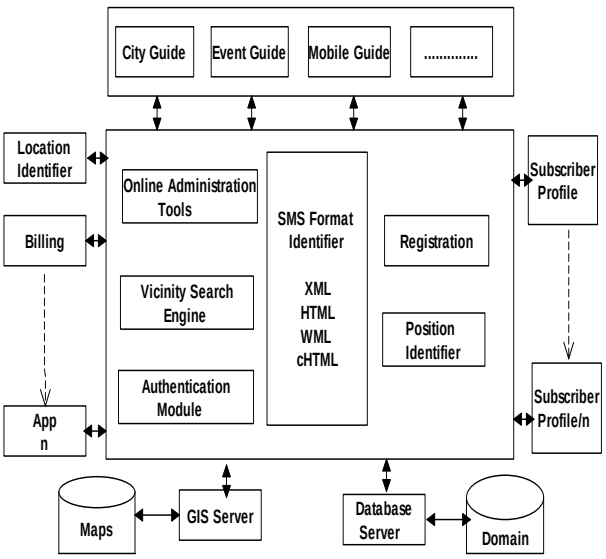

Fig 3: Data base Design

Location Identification

For location identification we have used a latest technology known as "Mapping Mashups" on which in Europe researchers are working on different directions and it variety of usages (www.educause.ed/eli).

Mapping Mashups commonly a combination of maps and search locator services. Mashups comprises different technologies in a single application. It combines the data with mapping applications locating services that operates and provides online mapping service in order to provide response to the client. Information feed to the map can be done by database that will be in the form of text notes, add lines and other geographical addresses. When user sends request information displayed about requested location at the client mobile in the reply.

This information will be in the form of text massage. Data mashup contains information that identifies the geographic location and characteristics. Some of the issues must be understandable and solvable by system to open the data, to add the new data in database in a way it will not affect on accuracy and quality and dealing with issues like security and privacy of the subscribers and system. This service is significant because of its quick response during user interaction with application and immediately connects with its database according to its location recorded information (Dunbar PJ *et al.*, 2003). Client gets benefit from mobile mapping mashups because they present information which is more relevant when you need any nearest location. You can create a mashup using sms and java to a browser on a device. Group of location can be shown by application on a map that represents geographical features and other elements of world. This report provides the idea that these services might be involve in map based data and location based services.

Case Study

For the sake of understanding the mechanism of mIS, here we have taken one application of Health Care (Drossos *et al.*, 2006) for the purpose of implementation with its procedure of conduct, design, functions and sample mIS with request of client and response of network. We have divided the Hyderabad city i.e. main chowks i-e: City Gate Chowk, Sadar Chowk, Tower Market, Hyder Market, Qasim Chowk, Qasimabad Nasim Nagger, Latifabad, Cloth Market Chowk, Railway Station Chowk and Hussainabad Chowk.

Fig. 4: Client Request

Fig. 5: Network Response

CONCLUSION AND FUTURE WORK

This piece of work is conducted on extremely a new idea to provide service to mobile clients (by their service providers) in different categories of emergencies when they are on the way.We have proposed many services w.r.t provide information to users when they are on the way. For the sake of understanding the mechanism of mIS, here we have taken one application of Health Care for the purpose of implementation with its procedure of conduct, design, functions and sample mIS with request of client and response of network.In future we wish to extend this work for the design of other suggested services and its implementation by designing of software.

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REFERENCES

Abhijit B., and K. G. Shin, (2006) "On Mobile Viruses Exploiting Messaging and Bluetooth Services," Securecomm and Workshops, No. 01-10, Aug. 28 2006-Sept.12006doi:10.1109/SECCOMW. 006.359562

Drossos, D., and G.M. Giaglis, (2006) "Mobile Advertising Effectiveness: an Exploratory Study," Mobile Business, 2006. ICMB '06. International Conference, 2006.26-27. doi: 10.1109/ICMB. 2006.30.

Dunbar P.J., D. Madigan, and L.A. Grohskopf (2003) A two-way messaging system to enhance antiretroviral adherence. Journal of the American Medical Informatics Association, 2003, 11-15.

Ferrer-Roca., A. Ca´rdenas, A. Diaz-Cardama and P. Pulido, (2004) Mobile phone text messaging in the management of diabetes, Faculty of Medicine, University of La Laguna, Tenerife, Spain Journal of Telemedicine and Telecare, 282-286.

Lavelle, B., D. Byrne, C. Gurrin, A.F. Smeaton, and G.J.F. Jones. (2007) Bluetooth Familiarity: Methods of Calculation, Applications and Limitations. In MIRW 2007 Mobile Interaction with the Real World, Workshop at the MobileHCI07: 9th International Conference on Human Computer Interaction with Mobile Devices and Services 2007.

Qiu, J. L. (2007) The Wireless Leash: Mobile Messaging Service as a Means of Control, Chinese University of Hong Kong International Journal of Communication, 74-91. 1932-8036/20070074.

Sohn, T., K. A. Li, G. Lee, I. Smith, J. Scott, and W. G. Griswold (2005) Place-its: A Study of Location-based Reminders on Mobile Phones. In UbiComp05: Seventh International Conference on Ubiquitous Computing, Tokyo, Japan, September 2005. 232-250.

Ye, J., L. Coyle, S. Dobson, and P. Nixon (2007) A Unified Semantics Space Model. In Proceedings of the 3rd international symposium on Location and Context-Awareness (LoCA 2007), Germany, September 2007. Louis Leun, Unwillingness-to-communicate and college students' motives in SMS mobile messaging, Science Direct, Telemetric and Informatics, 115-129.