INTERACTION BETWEEN DIFFERENT GROUPS OF CONVERSANT USING GSM CLOUD

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ABSTRACT: *Internet and mobile have revolutionized the world. Innovations are being made every second to make the life easier. The system increases the social connectivity of the people; the proposed system also acts as on demand encyclopedia which is helpful in case of emergency. This system will decrease communication gap between people, universities and organizations, everyone can remain connected with each other and can share important information. The encyclopedia part can also be narrated as on mobile search engine which will provide SMS search. Our idea will connect different experts and normal people by using GSM network and internet. People will query to the server for information and that server would multicast the request to related category experts, the response from different experts either from website or from GSM network would be unicast to that particular client. Centralized database server will save all the queries and experts' responses for further usage.*

INTRODUCTION

Global System for Mobile Communications (GSM) standard is developed by European Telecommunications Standard Institute [1]. This standard is one of the most successful and widely deployed standards in the field of mobile communication. The first successful commercial call was made using this standard in 1991, it's been more than 23 years since the deployment of this standard and it is still in use. Along with serving its purpose for mobile communication between humans it's also been used in different technical applications.

GSM based modules have been used in indoor applications like, home automation and security systems, Monitoring of different home appliances, automated door lock and unlock systems and etc.

These modules have also been used in telemetry systems for the logging of very far deployed sensor's readings [2]. For example it has been used in telemetry of canal waters, since installing wired sensors along with the canal to get its flow and level readings is an unrealistic approach and mostly

available wireless communicating modules can't cover greater ranges unless install a high power boosters on installer. So GSM seems a better option as compared to its fellow modules [3].

Many interesting and useful products are being made and marketing industry is trying its best to bring these products in public knowledge. These advertisements are on way from posters and television to websites. Now with the popularity of cell phones a new market of mobile advertisements has born and the GSM based servers are used for mobile marketing [4].

In the web world everybody is unknown and since it has become an essential part of our social and professional life it is very important to introduce robust authentication systems to make use of internet reliable for every individual [5]. GSM has played a vital role in this matter. Many service providers now use mobile authentication to secure the use of their services. We may say that involvement of GSM has tagged each internet user with a mobile number. GMAIL, Facebook, Yahoo, Hotmail and many more use this idea in some from.

The user can send his query using his mobile phone with the specific label to the GSM based Application server. This server will enter the query into the database server along with the mobile number of the sender. Then Semantic Search [6] and Sort module invokes and sorts the query under its thread. If this query is related to some information requirement and it has been encountered before then it replies to it via GSM based Application Server otherwise it forwards it to the cabinet of the experts of that field. Now when the experts reply to this query via web [7] interface of their mobile. Semantic Search and Sort Algorithm will store it into database and unicast the reply to the user. The user's identity will be kept secret [8]. So that no one would feel shy to state his problem. In case of criminal act the information may be revealed to the police.

In the other scenario, if a student wants to report a problem or suggestion to his dean or head he can text the information to this system and this system will sort and convey the message by keeping student's identity secure. The addressed person will receive the message on his web interface. In this way the message will be conveyed and a lot of time and effort will be saved.
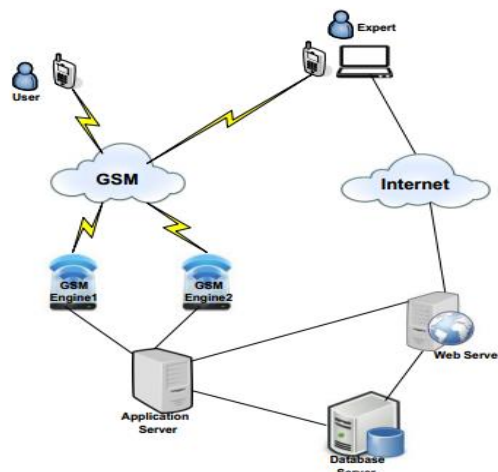

Fifgure 1: System Architecture

In spite we have so much at our disposal but there is still a communication gap between different types of people. The proposed system solves this problem with the specific purpose to decrease communication gaps among people. It suggests that everybody can write his problems, views or suggestions upon his environment and send it to his superiors. The ID of sender will be kept confidential and message will be conveyed.

LITERATURE SURVEY:

GSM based application server required extensive knowledge of GSM engine, SIM900 that I used in my project, then the open source operating systems in order to develop serial and network interfaces for inter and intra process communications [9]

GSM Engine (SIM900):

SIMCOM presents this information to its customers as a service, to support engineering and applications efforts to use products developed by SIMCOM. The information which is provided is mostly based on requirements specifically provides to SIMCOM for the customers. The SIMCOM have not taken any independence search for the additional related information which includes information that may be in customer's hand. Also, system validity of this product developed by SIMCOM within an electronic system keeps the responsibility of the customers' system integrator.

Figure 2: SIMM 900

In this system Red Hat Enterprise Linux platform is being used. This platform has many variants, with different server version like x86-64, x86, Itanium, IBM systems and PowerPC. This also includes desktop version of x86 and x86-64. By November, 2011 the last version of RHEL was RHEL6 [10].

Client-Server Programming Model:

Many networks applications are based on the concepts which we have learned already. For Instance, signals, processes, memory mapping, dynamics storage allocations and byte ordering, all play an important role. [11]. Each network application should be based on client-server model. In this model, there is one server process and one or many client processes exist. The server manages few resources and then provides some services to its clients by working on that resource [5].
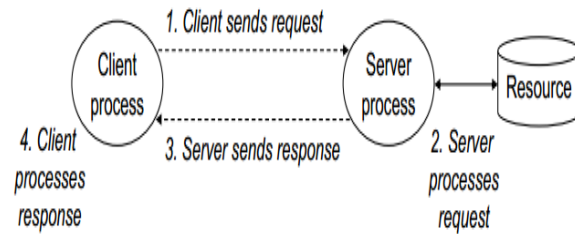

Figure 3: Client-Server Model

Socket was introduced in early 1980s for inter-process communication using Internet Protocol. The IP decompose all the communication into packets having finite sized chunks of data which are individually and separately travel from sender to receiver. Internet protocol allows bridges, routers etc. to droplet packets but there is not guarantee for delivery. Each packet has size to 655535 bytes. First twenty byes are reserved for IP header, and remaining bytes are available for user data [12]. Internet address are operated by using InetAddress Class. It takes care of DNS (Domain Name Server) lookup and its reverse look-up. Internet Protocol addresses are specified either by host name or the raw Internet Protocol address. [13]

Database is a collection of related data for a particular topic or purpose. The system needs database server to store queries and their responses for further use. MySql would be used as database management system in this system. PHP is very popular and powerful tool for creating interactive web sites. It is freeware which mean there is no need of any type of license for using it that is why it is most commonly used worldwide. PHP is mostly used with MySQL databases for creating more interactive and complex websites [14].

Semantic searching is a technique to search data in which search query purpose is not only to find keywords, but also determine the intent and contextual meanings of words the person is searching for. Meaningful results are obtained by semantic search by evaluating and understanding searching phrase and also find most relevant results in database, website, or any other database repository [6].

Google Style search is like keyword search, as we all know with its standard. When you enter some text in keyword searching, the search returns the resulting documents having the text you entered, the Google shows search engine optimization ranked text according to its relevancy but some people feel this type of searching fails in some cases. For example, to search a computer result by relying on keywords can be frustrating because it needs to search exactly the same wording you are looking for. This is not technology fault but ranking without something liking page is very hard. In fact, Google globally success is mainly from their discovery of an effective ranking strategy for the web. Semantic search tackle this type of problem. Instead of blindly returning any result that matches entered text into search field, semantic search takes into account the context of the search with the underlying meanings of documents being searched. [15]
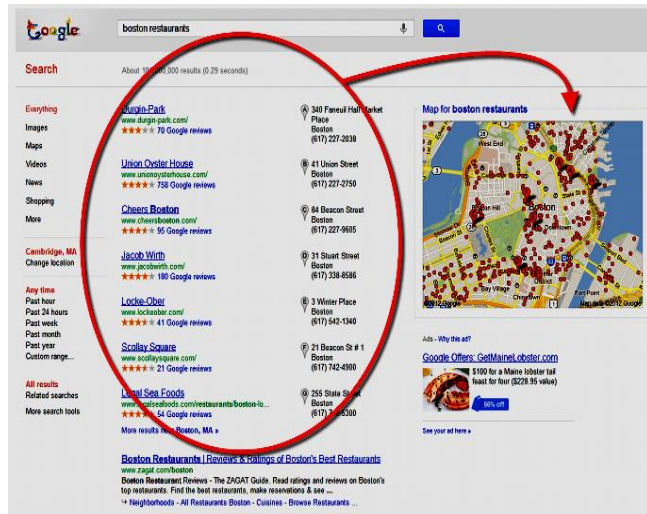
Figure 4: Google Searching

METHODOLOGY

The methodology used is known as "Waterfall Model". Waterfall Process Model was the first model which was introduced to develop software. ts use and understanding is very simple. This model is linear sequential; hence it means that in the development process new phase only starts when the previous phase has completed with no overlapping [16].

Development of GSM Cloud

Two GSMEs are used to maintain the quality of service. GSME1 will be listening for the queries from clients via GSM network moreover it'll reply to the clients for their queries. GSME2 will connect experts to the AS via GSM network. AS is the heart of the mobile based encyclopedia, it is the open source server developed on RHEL to control and compile the data coming from the GSM network and Internet [15]. The responsibilities of AS are, to save the queries and replies into the DBS, AS will retrieve the list of experts from the DBS and multicast the queries to the team of experts. By keeping in mind the sensitivity of some specific categories like Medical a priority queue is maintained in the AS which is controlled by a scheduler to provide the in time service to each client. MySQL is used as DBS to save the record of the queries, replies, experts and clients. Web server is developed for the experts if they want to reply via internet, this response will be received by a listener in the AS and then AS will perform further tasks upon that specific query [17].

The very first component in the AS is the GSME Connector. It has two parts, first one is in hardware form and other one is in software form. In hardware, GSME uses TTL at its serial port. To interface the hardware board of GSME we have to make a serial port translator which translates the voltage level of GSME and serial port of the computer into each other so that communication could be made possible between GSME and Computer [9].

Temporary Buffer:

As the request is received from the client it is stored in the initial queue which is named as temporary buffer. After that GSMEs will go back to the listening state. A format checker which is a threaded process will pick the request from the temporary buffer and check if the request is received in the proper format or not. If it is in the proper format then a confirmation will be sent back to the client about the reception of the request. The format of the Request is to insert the category then comma and then state the query [5].
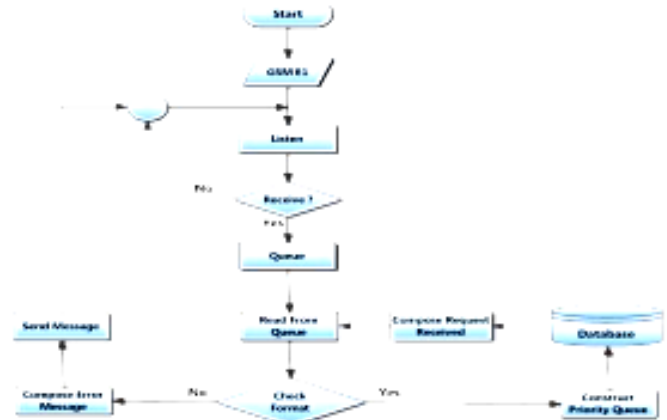

Figure 5: Client Query

Priority Queue:

Some categories are very sensitive and need immediate response from the server like Medical. For example if the health of a person is critical and he needs immediate medical attention; one of his friends asks about the first-aid procedure from the expert while they are on their way to hospital to stabilize the patient then we'll have to facilitate him on our first priority. But we can't put ultimate focus upon selective categories because other clients would feel embarrassed. In order to handle this problem with the limited resources we have developed a priority queue which will fetch the requests from the Temporary Buffer and fill in the priority Queue. It is implemented using the data structure of circular linked list. There is a smart scheduler which will get Ni number of requests from the priority queue where i is the tag of priority and Ni are number of requests from the priority i in each cycle [5]. Ni is calculated by the formula:

$$N_i = P_i /100 * (x_1 + x_2 + x_3 + \cdots +)$$

Where: P_i is the priority of the category i and x_i is the number of requests for the category

After maintaining the queue smart scheduler will pass the request into the next process which will save the request into the database and generate a file number which will be unique ID of the request. This ID is duly beneficial; it enables the system to differentiate responses to each request and maintains the privacy of client [5]
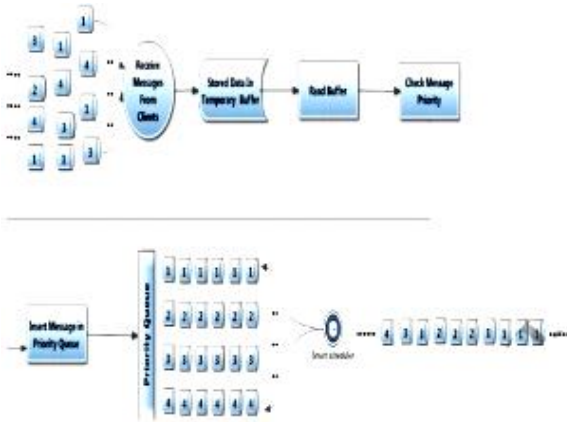
i.

Figure 6: Priority Queue

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Figure 7: Multicast Request to Experts

Response from Expert:
Each expert has two choices to respond to a request. First one is to use the mobile phone and other is via Internet.
Response from Expert via GSM:
If he has a compatible mobile phone then he can install our app. When he opens the app, a list of requests will be shown

to him. He'll select the request and write the reply. This reply will be then encapsulated into the header [18] which is like; ::Request_ID,Reply::

Figure 8: Encapsulation of Reply

If expert doesn't have compatible mobile, he'll have to write the reply himself into header format. This request will be received by application server via GSME2. Application Server initiates a process which will first confirm the mobile number of the expert first, if the number doesn't belong to the respective category of the expert then he'll prompt that you are not authorized to post this reply. If reply is from authorized expert of the respective category then it'll be stored into the database and unicast to the client in following format

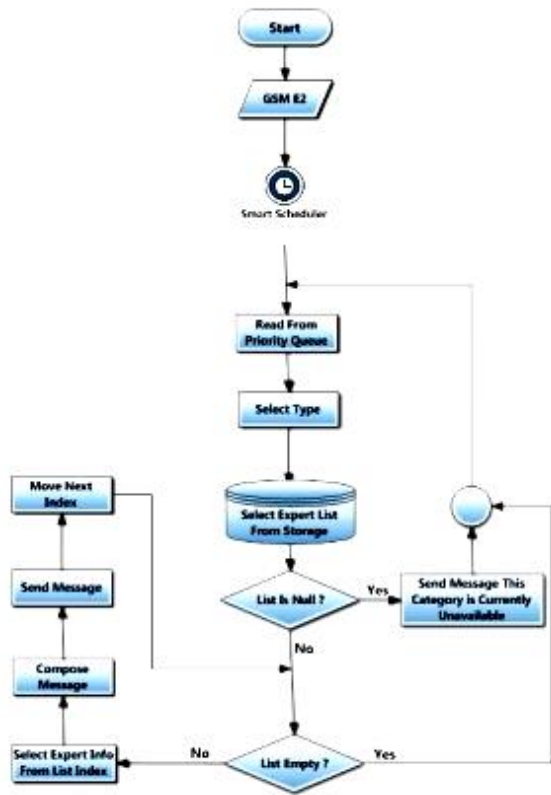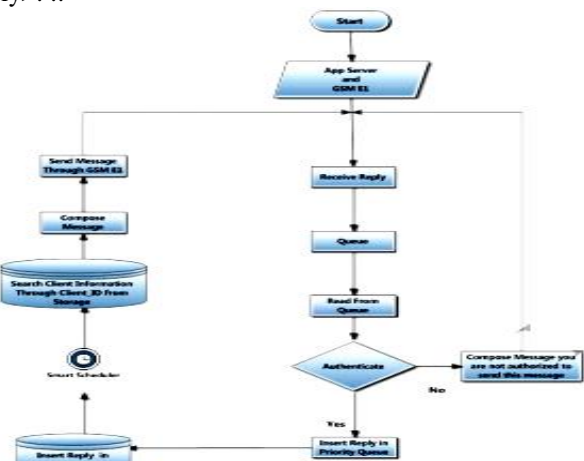::Q: <Question of the client>. A: <Answer from the expert>. E: <ExpertName>. DOQ: <Date of Query>. DOR: <Date of Reply>. ::

Figure 9: Reply for Expert via GSM

Response from Expert via Internet:
The other choice is to reply via internet. Web Server is developed on apache. The first expert will log on to web server via username and password. Then a list of queries will be displayed on the page.
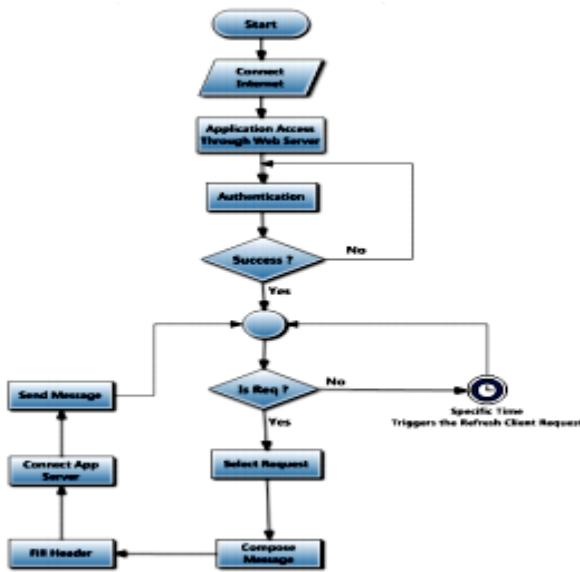
Figure 10: Web View of Expert

The expert will click the request and write the reply. This reply will be then encapsulated and sent to the AS. Here we have developed a client server scenario to handle the reply. A server is developed in C which is acting as a listener and its client is developed in PHP [18]. When expert posts a reply, it'll initiate a client which establishes a connection with listener over TCP and send reply to it. This listener will initiate the reply process which is same as reply via GSM except the authentication process.
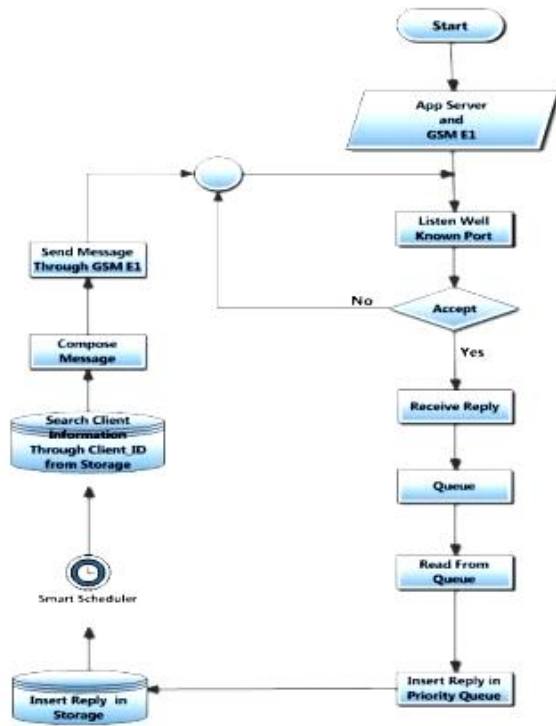

Figure 11: Reply from Expert from Web

CONCLUSION & FUTURE RECOMMEDATION

It is a versatile service which can facilitate each type of query from each type of client. It handles the queries based upon their defined priority ratio. In this way we can educate people just with the help of a text message. Moreover this service can reduce the communication gap between the higher authorities and a common person which can lead towards a compatible society. It can transform an educational institution into such a platform where deans and facility heads are virtually linked to the students and can construct such foundations where there is no place of corruption or mistreatment.

This encyclopedic module enables the system people in learning anything anywhere without bothering to sit and search about it by virtually bringing them to those who have actual words to explain the solutions. This modules can also help people in medical accident scenarios who are far away from any hospital and ambulance range or time doesn't give them enough liberty to wait for one. Its encyclopedic module enables it to help people in learning anything anywhere without bothering to sit and search about it by virtually bringing them to those who have actual words to explain the solutions. The sematic module and be refine to reduce expert's interaction for similar scenarios.

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