Text Based Conferencing System (TBCS) on mobile phones

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ABSTRACT

Current chat systems suffer from the fact that a user has to be stuck to a computer or a TV channel in order to use such systems. This paper describes a mobile chat system that can be used while on the move by any user who has got a Java enabled mobile phone. This system will allow multiple users to exchange messages in different chat rooms and different subjects depending on their interests. Moreover, users of the system will have the ability of freely talking with others publicly or privately, searching for other users, and some other nice facilities. It provides a friendly user interface to attract the Mobile users.

Key Words: Client-server, Chat, GPRS, Java 2 Micro Edition (J2ME), Mobile Networks.

1. INTRODUCTION

Wireless devices especially mobile phones are new entrants in the information technology arena. Since the wireless devices are these days widely used, the focus of information technology is rapidly shifting from using PCs to using them. These devices are becoming increasingly sophisticated in response to the demand for using them to access the Net as well as computing devices. Moreover, these devices are paving the way for new business strategies.

Nowadays, there exist great advances in interactive technologies within different fields such as electrical, computer telecommunication, and so many other fields. These advances have made people's life much easier and more comfortable than ever.

Currently mobile devices are one of the most important and indispensable things in life. As a result, new technologies have been developed in order to make the mobile devices more interactive and easy to be used and also to open new ways of communication whether it was simple voice communication or visible communication.

Java has enabled the mobile devices to be more interactive by developing nice interfaces, games and so many applications. The tool that is used in order to develop these applications is Java 2 Micro Edition (J2ME) [7]. J2ME dramatically changed the face of wireless mobile computing by making it possible to develop special Java programs (MIDlets) that are primarily designed to meet the needs of wireless mobile devices [1-3].

1.1 TBCS against other applications

The importance of such an application has arisen from other application such as Web application and/or Television application since there is a huge number of users' using these applications.

1.2. Web Chat Systems

Web chat systems are widely used within the web where millions of web users spend most of their time doing nothing except chatting. They are using their Computers and/or their laptops to chat with others from anywhere in the world such as, MSN messenger, Yahoo messenger, Paltalk and others [9-11].

1.3. Live Chat within Television

People nowadays have moved to the Live Chat that is provided by different television channels where most of the

mobile phone users spend most of their time and money by sending SMS and/or MMS messages in order to chat with others. The messages are then displayed on TV shows. In addition, it has been found that about 33,000 messages are sent per hour per television channel which is really a large number [8].
The problem with the previous examples is that the user cannot move away from his/her computer or laptop and the Television in order to see all messages. On the other hand, TBCS application can be used while on the move.

2. OVERVIEW OF THE TECHNICAL AREA

Mobile devices are the next generation computing environment with information and communication technology everywhere for everyone and at all times.
Mobile devices are becoming smaller in size but more powerful in computing ability. They are influencing new ways of life and affecting many people in a number of disciplines such as education, communication and social behavior [6].
Nowadays people are witnessing the end of the dominance of the traditional personal computers and the beginning of the ubiquitous computing revolution. This revolution is characterized by the following observation:

- Computing is spread throughout the environment.
- Users are mobile.
- Information devices /applications are increasingly available and becoming smarter.
- Communication is made easier and information is accessible from any mobile position.

3. TECHNOLOGIES USED

3.1. Java 2 Micro Edition (J2ME)

Java 2 Micro Edition (J2ME) [1-4,7] enables Java applications to run on small, resource-constrained computing devices. It does not define a new language; rather, it adapts existing Java technology for handheld and embedded devices. Compatibility with J2SE is maintained wherever feasible. In fact, J2ME removes the parts of J2SE that are not applicable to constrained devices, such as AWT and other features.
The Java 2 Micro Edition consists of the technology, APIs, tools and standards needed to create applications for consumer devices. J2ME specifically targets the consumer space, which covers the range of small commodities such as smart cards and pagers all the way up to the TV set-top boxes. J2ME provides a complete solution for creating dynamically extensible, networked products and applications for the consumer and embedded appliances.

3.2. J2ME network connections

One of the most critical aspects of J2ME is network connectivity. Although J2ME devices can be useful when they are not connected to a network, the ability to make a network connection provides a means to tap into the powerful resources available on a network. Even more significant are the emerging capabilities to establish a wireless network connection. Many J2ME devices support this capability, which opens the door to providing features on devices that go beyond sending and receiving email, such as extending the enterprise into the mobile space. J2ME applications, in this regard, become more than simple communication devices. They become another client capable of interfacing with the enterprise systems, databases, corporate intranets and the Internet [1-4].

4. DESCRIPTION OF THE SYSTEM

3.1. Client Side application

The client side of the system consists of two main parts which are Authentication and Registration as shown in Figure 1.

3.2. Registration

For any new user to the system, it is required to have a user name and password

to be able to login into the system. So, a registration process must be accomplished in order to have a unique user name. The registration process involves appending the following required categories: username, password, country, city (optional), phone number, favorite room and auto redirection (YES/NO).

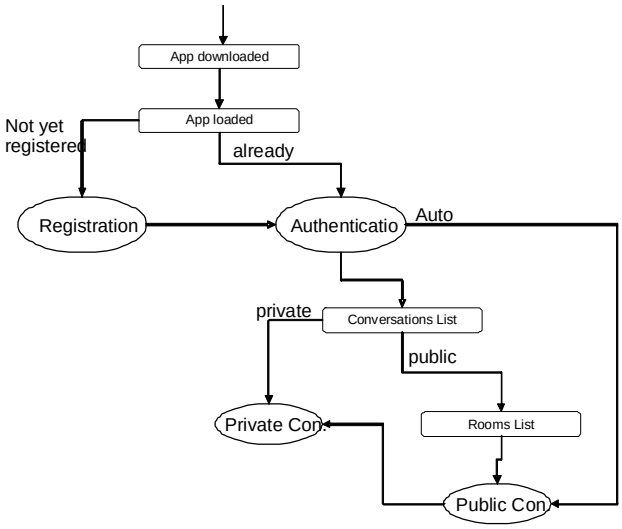

Fig. 1: System application diagram. The system consists of Registration process and Authentication process

Whenever the user accomplishes the registration process, the data will be sent to the server. The server will then check if the username has not yet been taken by another user. If yes, a negative response will be sent back to the client to choose another username, otherwise the user will be successfully registered in the system and a positive response will be sent to the client that the registration has been successfully accomplished.

3.3 Authentication

The user can login to the system after a successful registration process by providing a valid username and a password. Both the user name and password will be sent to the server to check if they are valid or not. If not, then the server will send back a negative response informing the user to try again, otherwise the user will be able to login into the system.

The user will be automatically redirected into the public conversation if he/she has already selected this choice (auto redirection choice) otherwise the user will be directed to the conversations list (public, private) so that he/she can select one of them to start chatting.

3.4 Rooms' statistics

In addition to the previously mentioned functions, a useful function has been added to the client side which is rooms' statistics. This function shows the total number of users in each room to give the user a variety of choices before selecting a room.

E. System State diagram

Figure 2 shows the main functionalities that are available for each user in the system.

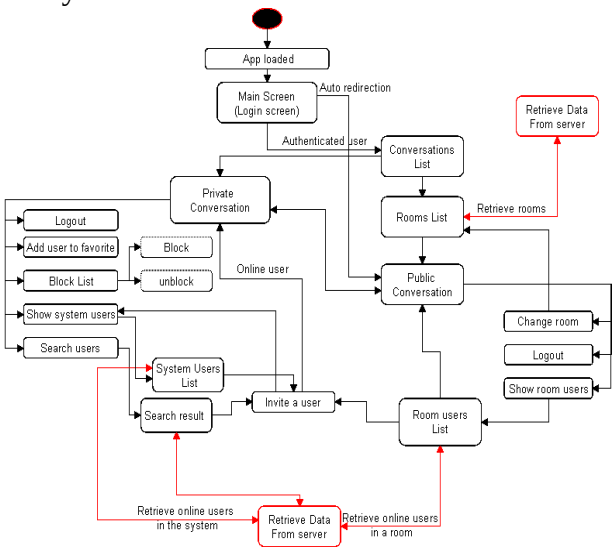

Fig. 2: System functionality diagram for public and private conversation.

3.5 Server Side application

The server of the system receives all the client requests and sends a certain response back to them depending on the request type. These requests can be divided into seven main requests which are authentication, logout, search, room, status, users list and new user request as shown in Figure 3.

Each of the previous requests will communicate with the database in order to retrieve, update and/or insert data. For example, for an authentication request the user name and password will be checked if they are valid or not. If they are valid then the status of the user will be updated since the user has been able to login otherwise an error message will be sent to the user.

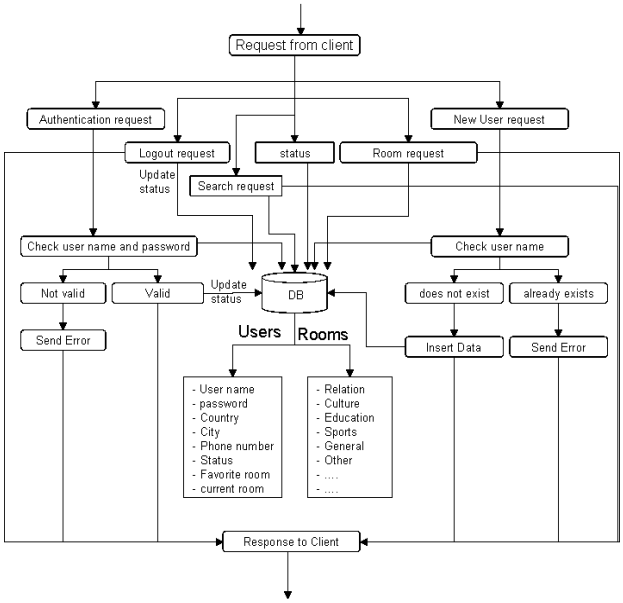

Fig. 3: TBCS server diagram. Different client requests are shown.

3.6 Administrator Interface

A web interface for local administrators has been designed to provide an easy way for monitoring any assigned room. Any administrator will be able to login, retrieve the latest messages, block and/or unblock users. Figure 4 shows the web interface that has been designed. The following functions have been developed:

- Monitor Chat Room: This function allows the administrator to monitor the assigned room. Moreover, the admin can block and/or unblock any user at any time.
- Rooms statistics: This function allows the ad min to check out the total number of users in the other rooms

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5. RESULTS AND DISCUSSIONS

5.1. Database

Whenever the server receives any request from the client, it will check the flag type of the request and act upon each its type. When the server communicates with the Database it will whether insert, update or retrieve data.

Any new user data will be inserted into the database since the username has not been taken. The user data can be updated whenever a user logs into the system, joins/changes a public conference, changes the auto redirection choice, changes the favorite room and logout from the system.

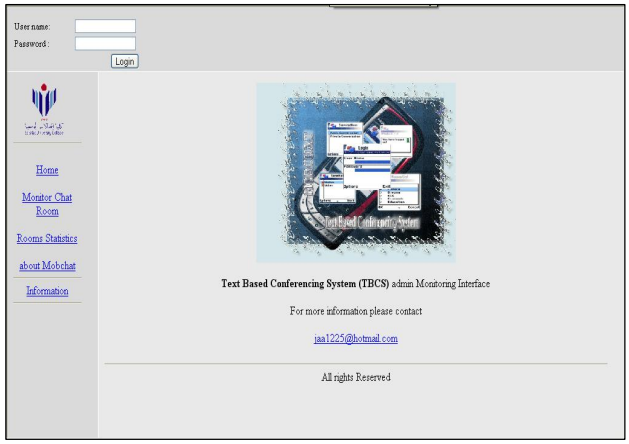

Fig. 4: Administrator web interface

5.2. Retrieving Data

Data such as users list and room's list can be retrieved from the database and displayed on the client screen. Whenever the mobile application is loaded, the login screen will be shown where the user should enter the user name and password to login into the system as shown in Figure 5a.

5.3. Registration

For a new user, a registration process must be done to have a unique user name and to have some required data in the database. To switch to the registration screen the "Sign Up" command must be selected as shown in Figure 5b.

By selecting the previous command, the system will communicate with the server in order to retrieve all the available rooms so that the user can append some required information and select the preferred room to chat in as shown in Figure 5c.

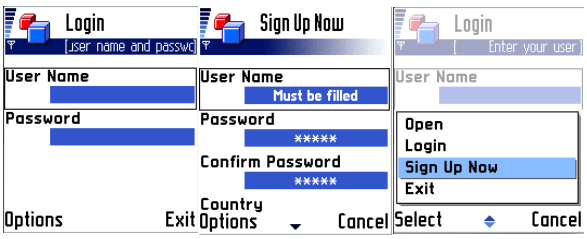

Fig. 5: a) Login screen. b) Sign up command. c) Register screen

5.4. Public Conversation

In a public conversation, each user will be able to freely talk with others in the same

room as shown in Figure 6a. In addition to that, any user can at any time retrieve the latest messages, change the room, switch to a private conversation and/or invite any user to start a private conversation as shown in Figure 6b.

5.5 Private Conversation

Any user in a private conversation must have another user to be able to start talking privately as shown in Figure 6c; otherwise an error message will be displayed. In addition to that, the user can have the following commands that are shown in Figure 6d in a private conversation.

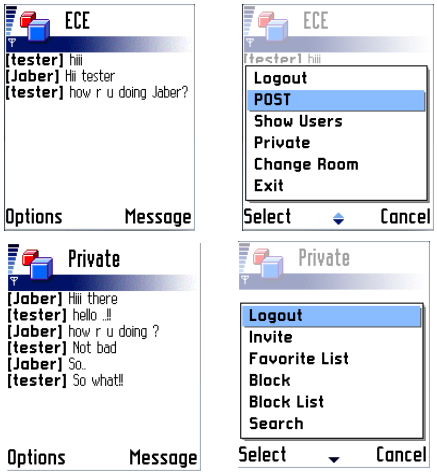

Fig. 6: a) Public conversation. b) Public commands c) Private conversation d) Private commands

5.6 Admin web interface

The admin web interface provides for any assigned administrator a good and an easy way of monitoring rooms. By using the available facilities, administrators can block users, unblock users and show rooms statistics. Figure 7 shows the administrator's monitoring screen.

5.7. Blocking/unblocking users

The available features for the admin in any public conference are blocking users from joining the room and/or unblocking users. On the right side of the screen, there are two lists which are online users in the current room and below it the blocked users list. So, if any online users have been blocked, they will be listed in the blocked list as shown in Figure 8. At any time, the administrator can unblock the user by clicking on the "Unblock User" button where the user name will be removed from the blocked users list.

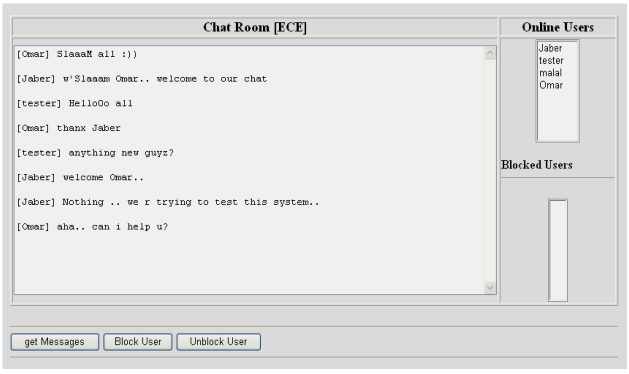

Fig. 7: Admin Monitoring screen. Administrators can monitor each room and block/unblock users.

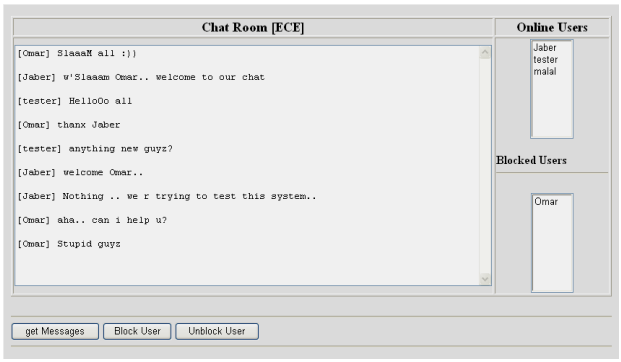

Fig. 8: Blocking a user. Administrator can block users at any time by clicking on "Block User" button.

6. CONCLUSION

With recent technology advances, there has been an explosion of cellular and wireless personal communication systems whose ultimate goal is to provide universal and ubiquitous personal services without regard to mobility or location. This rapid growth in wireless information technology has created possibilities for new applications. Text Based Conferencing system (TBCS) is a new application that has been developed to provide Mobile chatting systems for Java enabled mobile devices.

TBCS enables the users of the mobile phones to meet their friends and/or other users in order to exchange their points of view on certain topics. Finally, the system can be extended to provide voice conferencing.

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