



A Real Time on Demand Mobile Mapping System for Vit University – An Approach for Java Enabled Mobile Devices

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Abstract: This paper deals with the development, deployment and implementation of context aware multimedia applications in mobile devices. Context Aware multimedia application can be developed using Bluetooth technology with encrypted data and security [1]. Bluetooth applications can be developed with the help of J2ME which has the optional API's to develop Bluetooth applications. This paper is based on the multimedia applications in mobile devices through which a visitors can find various routes he/she wants to visit with the help of his mobile device. One such service for handheld devices is a "Mobile Mapping System", using which a new visitor to a place can get all fundamental information about the VIT University. The various information that the user can become acquainted with are location details with navigation map, various facilities in the form of image, audio and video depending on the mobile device of the user. The implementation consists of five modules such as Registration, Login, text and image, audio, video and the help module. The registration module will get the user details such as name, address, phone no, etc. The login module will furnish the login name and the password. The text and image module will furnish the needed information of the places he/ she chosen to visit in the respective format. The audio and video module will give the information in audio and video format and the help module will demonstrate how to use the application.

Keywords: Java 2 Micro Edition (J2ME), Mobile Information Device Programming (MIDP).Application Programming Interface (API), Global Positioning System (GPS).

I. INTRODUCTION

Context awareness is the capability of the networking applications to be aware of the existence and characteristics of the user's activities and environments. In rapidly changing scenarios, such as the ones considered in the fields of mobile, pervasive, or ubiquitous computing, systems have to adapt their behavior based on the current conditions and the dynamicity of the environment they are immersed in. In order to function according to a user's expectation, these systems have to consider the situation, activity, and state of the user and all other relevant entities. Such information is commonly referred to as context and the environment which provides this ample opportunity is called as context awareness [2], [4]. Context aware applications can be deployed in wireless environment which makes the use of Bluetooth technology. Bluetooth technology is a wireless technology which helps the user to communicate to any data and anywhere. Bluetooth applications can be developed with the help of J2ME which has the optional API's to develop Bluetooth applications. The Multimedia guidebook which is developed using the above concept will be loaded on demand based on the user requirements. The user will be provided a username and password after registration to access the guidebook details of the developed environment. The guidebook will really helps the visitor to know about the current location of his presence.

II. WORKING

When the mobile users enter in to respective region with his mobile device, an application will be automatically triggered in his mobile device with the help of J2ME and Bluetooth furnishing the information of that respective

location. The application so provided is an attempt to provide location based services without the use of GPS system. This is because only the high ended mobiles support the technology of GPS and hence the application cannot be used by common man. The proposed framework of the application can even run on the simplest of all java enabled mobile phones supporting the technology of GPRS [5]. The multimedia guide can be implemented in real time using a Bluetooth connection with security.

In Fig 1 we have explained the proposed framework for VIT mobile guide system. The mobile device is the client and the centralized server is a Bluetooth enabled terminal. The application runs on the mobile and the information can be retrieved from the server and all the modules in the applications are developed using MIDP with CLDC as the configuration.

In Fig 2 we have explained the user interface in the client side. Once a visitor enters the VIT University, a welcome message triggered in the respective mobile device asking the visitor to register. The visitor has to enter the login id and password to get access to the application after registration. The application will check whether the entered login id and password and if it is not matched, it will ask them to login again. After login to the system, the visitors can be given access rights to text, image, audio and video based on the memory space and features they have in their mobile device.

III. IMPLEMENTATION OF THE SYSTEM

In this section we describe the simulation results of all modules. It also describes about the functionalities and features of each modules. All the modules have been developed using J2ME.

A. Here Are The Steps For The Development And Execution Of A Midp Application

- [a] Write the MIDP application.
- [b] Compile the application.
- [c] Test using one or more device emulators.

- [d] Deploy to an application vending machine.
- [e] Deploy the application to the device.
- [f] Run the MIDP application.

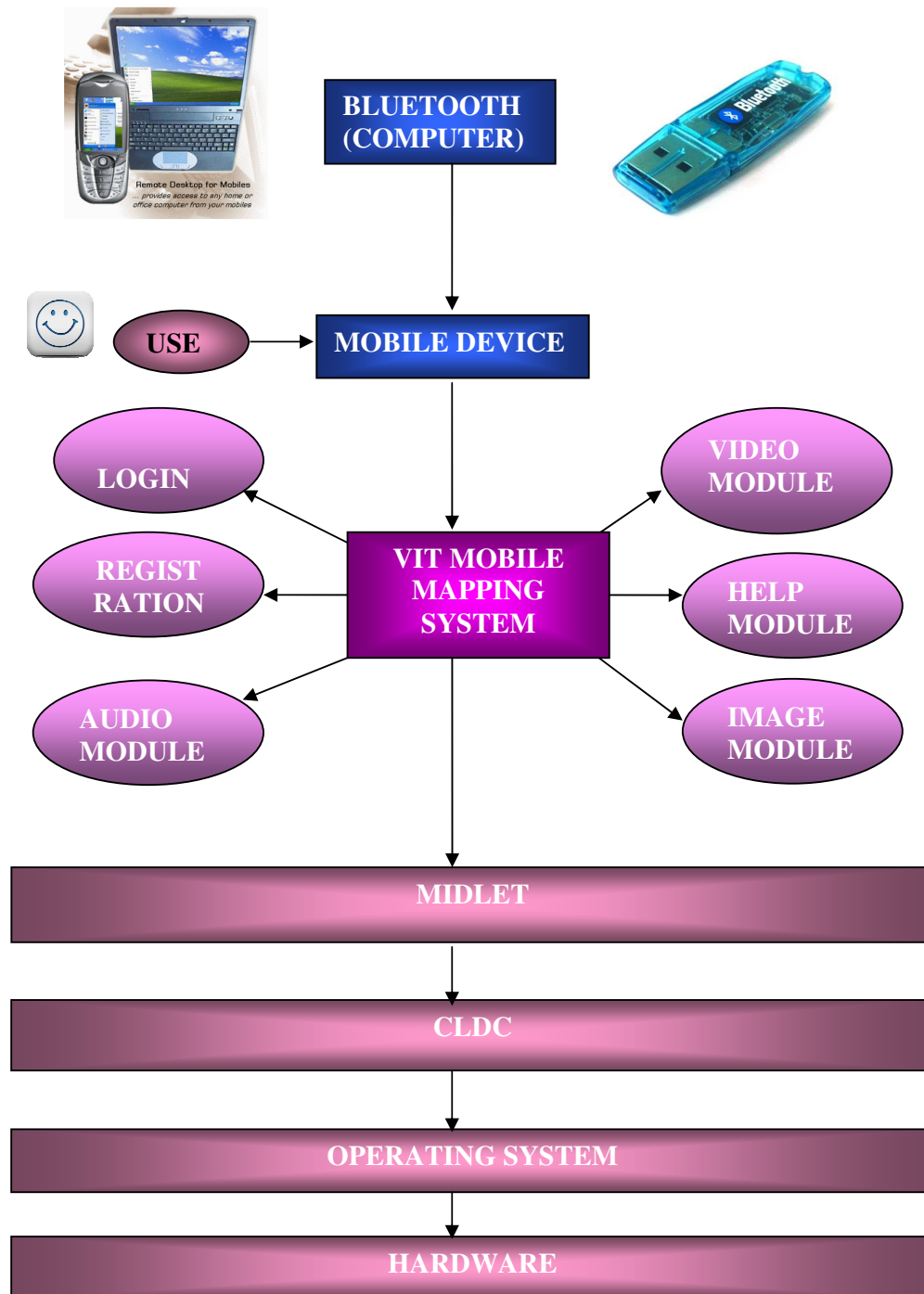


Figure: 1 Framework of VIT mobile guide system

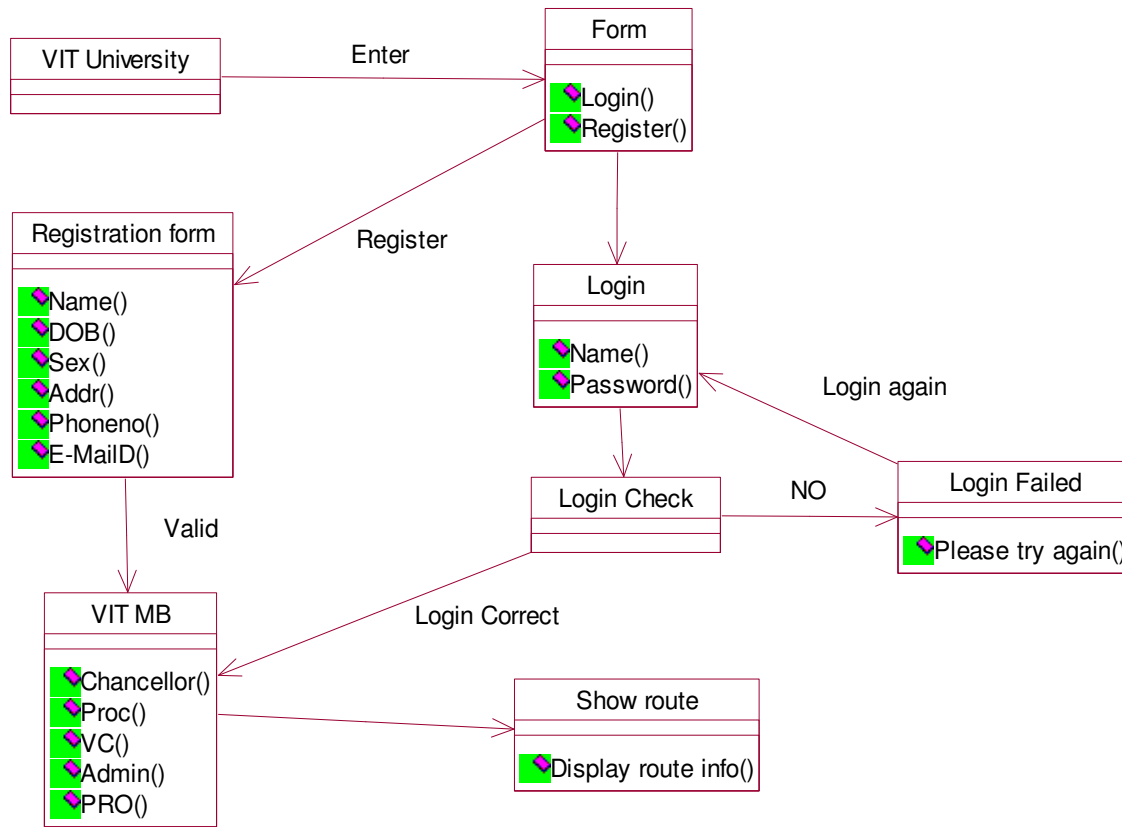


Figure: 2 USER INTERFACE DIAGRAM

B. MIDP Deployment

Java files are created, they are compiled, and then they are packaged. The tasks necessary to take a MIDP java file from creation to deployment are given below:

- Create the java (.java) file using an editor.
- Compile the .java file using the javac command.
- Preverify the .class file.
- Package the verified .class file into a JAR (.jar) file.
- Deploy the JAR file and the JAD file to the device.

In Fig 3 we have explain the login module. Use the statement `login=new Command ("LOGIN", Command.OK, 1);` to instance the class-object `login` of `Command` class. Call the `addCommand ()` method to interact command `login` with the `Form`, and call the `setCommandListener ()` method to build the relationship between `Form` and `CommandListener`. Call the `setCurrent ()` function in `Displayable ()` method to show the main interface of the project .When the user click `login`, it will call the function `display.setCurrent (form)` to display the main menu. When user selects one of the options and presses the `ok` command it will call the `commandAction ()` method, according to the value of the `cmd` to judge which option the user has selected [11]. For example, if the Video has been chosen, it will call the `VideoCanvas`, which implements the `Runnable` and `CommandListener` interface.

In Fig 4 we have explain the various modules like image, audio and video. Below is the pseudo code.

```
// Image module
try
```

```
{image = Image.createImage("/mapvit.png");
endImg = Image.createImage("/cc.png");
check = Image.createImage("/check.png");
errImg = Image.createImage("/err.png");
} catch (java.io.IOException e) {
System.out.println("Error loading Image: "+e.toString());
// Audio module
InputStream in =
getClass().getResourceAsStream("/BESM.wav");
Player player = Manager.createPlayer(in, "audio/x-wav");
player.start();
// video module
InputStream in =
getClass().getResourceAsStream("/VITVID.mpg");
mPlayer = Manager.createPlayer(in, "video/mpeg");
mPlayer.realize();
if ((mVidc = (VideoControl)
mPlayer.getControl("VideoControl")) != null)
{
mVideoItem = (Item)
mVidc.initDisplayMode(VideoControl.USE_GUI_PRIMITI
VE, null);
mMainScreen.append(mVideoItem);
}
mPlayer.start();
```

In Fig 5 we have explain the server side application. In the server side the administrator has to set the Bluetooth passkey and data encryption. Based on the key set by

administrator, the visitor has to enter the same key to get access to the application. The key will be sent to the visitor after registration and this key can be made as one time key by the administrator for security purpose. The server side application was able to fully examine the elements that the framework was able to offer, namely:

- [i] Search and discovery of Bluetooth mobile phones
- [ii] Search and discovery of Bluetooth services offered by server
- [iii] Automatic authentication of Bluetooth connections created
- [iv] Transfer of applications
- [v] Monitoring of participating devices

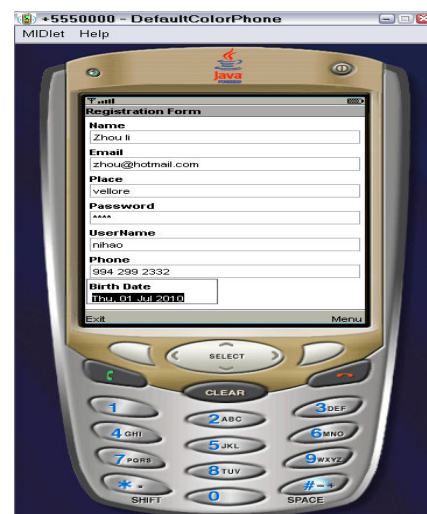
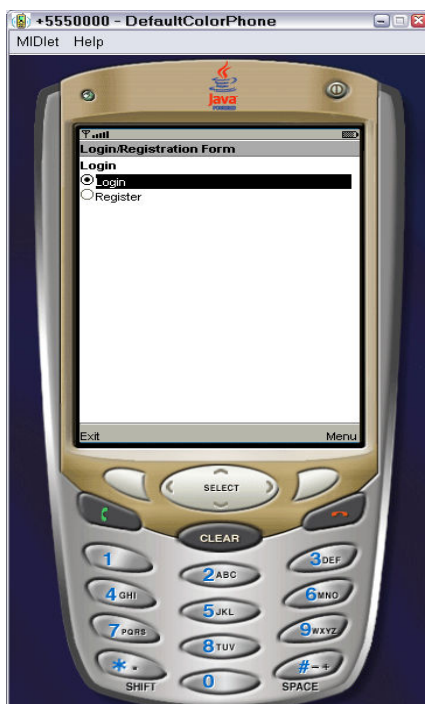
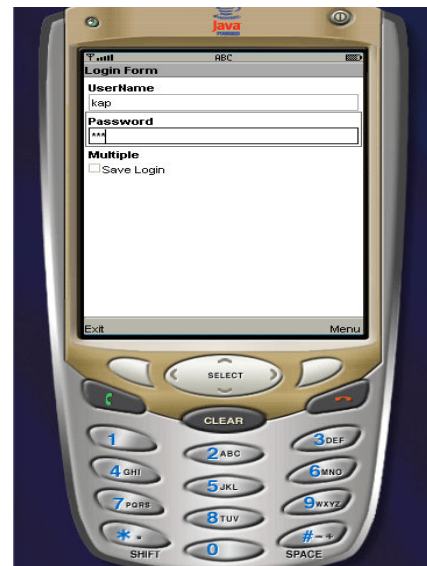
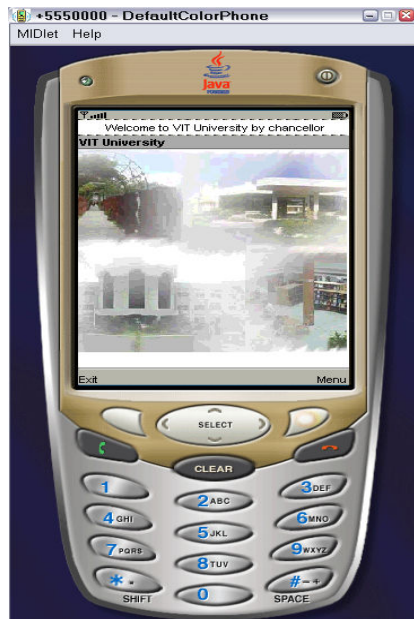


Figure: 3 LOGIN AND REGISTRATION MODULE (CLIENT)



Figure: 4 IMAGE, AUDIO AND VIDEO MODULE

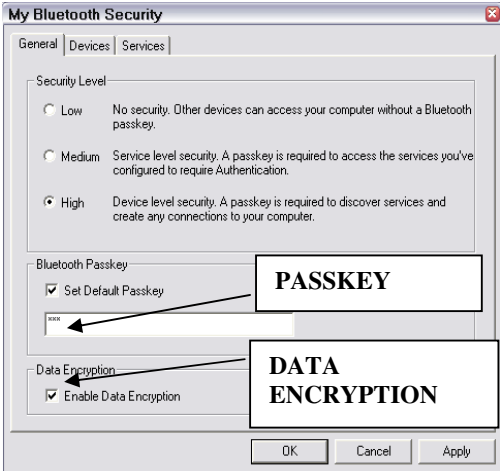


Figure 5 SERVER SIDE

IV. CONCLUSION AND FUTURE WORK

In this paper, a framework is developed for the development, deployment and implementation of context aware multimedia application on demand based on location based service without using GPS. The simulation result for various modules like login, registration, text and image, audio and video are working well and it can be deployed in any java enabled mobile device. It is shown that there is a possibility to create intelligent user centric applications offering multimedia user interfaces [10].

For future work, we plan to add more services like student course registration; class room management, enhance the functionality of the system, and evaluate its performance in a live wireless environment. In addition, we plan to address the security and privacy concerns for the perspective customers and to develop the applications without Bluetooth since some of the mobile phones don't have Bluetooth connection. Further work will focus mainly on deployment of the application on commercial services [7], [8].

V. REFERENCES

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