

Interactive Services and Challenges for Mobile Application News

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Abstract: *In this paper, we describe the design and implementation details of a mobile application supporting news access and virtual community interactive services, based on open technologies such as Android, Java programming language, Android libraries, MySQL database and an open Web server. Data communication in mobile has many challenges and the effective data communication shall support the mobile users in exploiting the different facilities through this ad-hoc network. The goal was to create an easy to use, mobile, interactive, flexible, including a portable Android client and a Web portal access to the content. To prove these features, we chose to implement and compare two different kind of interactive services, and made plans for further services and improvements.*

Keywords: *Mobile Application, Mobile Database, Mobile Database Communication Interactive Service, Portal; News Access, Virtual Community, Open Technologies, Android; IDE.*

I. INTRODUCTION

The future of mobile computing is becoming even more exciting. Mobile devices are continually growing more capable, especially with the advent of cleverly integrated phone capabilities. With better and better wireless networks capable of transferring media in real time, an entirely new breed of applications is now possible. Riding this new wave may be extremely profitable for organizations positioned to take advantage of it [1][2][3]. The mobiles in current state of technology use ad-hoc wireless networks. It supports wireless communication and the mobile users are roaming from cell to cell. The switching centre located centrally takes care of the data communication in this network. The data accessed through mobile devices is mainly from the database stationed at permanent site located centrally and accessed through Mobile Switching Centre; this database is called Mobile Database.

The latest mobile software platform is Android. The Android build tools—whether Eclipse-integrated or stand-alone—will turn the contents of your project into an Android package (APK) file, which is the Android application. Those tools will also help you get your APK file onto an Android emulator or an actual Android device. Before you start coding, you need to install Java, an IDE, and the Android SDK. For the development of application you need a copy of Java 5.0+. All the Android development tools require it, and programs you write will be using the Java language. JDK 5 or 6 is required. It's not enough to just have a runtime environment (JRE); you need the full development kit. I recommend getting the latest version of Sun JDK 6.0. Mobile Web access has many advantages. Unlike the fixed Web, the mobile Web will go where you go. No longer will you have to remember to do something on the Web when you get back to your computer. You can do it immediately, within the context that made you

want to use the Web in the first place. While becoming increasingly popular, mobile Web access today still suffers from interoperability and usability problems. W3C's Mobile Web Initiative addresses these issues through a concerted effort of key players in the mobile production chain, including authoring tool vendors, handset manufacturers, browser vendors and mobile operators [4]. Our solution follows these best practices, based on a free of cost, open-source, and easily adaptable stack of open source software: an IDE, MySQL and PHP.

We will present the design and implementation details of a mobile application supporting news access and virtual community interactive services, based on open technologies such as Java programming language and Android, MySQL database, PHP dynamic content and Apache open web server. Our goal was to create an easy to use, mobile, interactive, flexible and extensible client-server solution, including a portable Java client and a Web portal access to the content. To prove these features, we chose to implement and compare two different kind of interactive services, news access and virtual community, and made plans for further services and improvements. The paper is organized as follows. Section II briefly introduces the main open source technologies used to build our mobile client-server application. The client Android application screens and the navigation map are described in Section III. Section IV is concerned with overall client-server scenarios and a comparison of two different interactive services. In Section V we give some concluding remarks and discuss further plans.

II. THE OPEN TECHNOLOGIES THAT BUILDS THE APPLICATION

A. Android

Android combines the ubiquity of cell phones, the excitement of open source software. The result is a mobile platform you can't afford not to learn. Getting started developing with Android is easy. You don't even need access to an Android phone—just a computer where you can install the Android SDK and phone emulator.

To create an Android application, you will need to create a corresponding Android project. Those tools will also help you get your APK file onto an Android emulator or an actual Android device for testing purposes. You get a commonly used programming language (Java) with some commonly used libraries with support for tools you may be used to using an IDE (Eclipse). We have Dalvik Virtual Machine (DVM) for android by which the application will be executed on the system for the execution. You get a fairly rigid and separate framework in which your program needs to run on the phone and not interfere with other programs or the operation of the phone itself. In Android, applications can define one or more activities to handle different phases of the program. In Android, just about everything goes through intents, so you have plenty of opportunities to replace or reuse components. A content provider is a set of data wrapped up in a custom API to

read and write it. This is the best way to share global data between applications. Its more safe and secure. Every application is assigned a specific user ID. Any files it creates cannot be read or written by other applications.

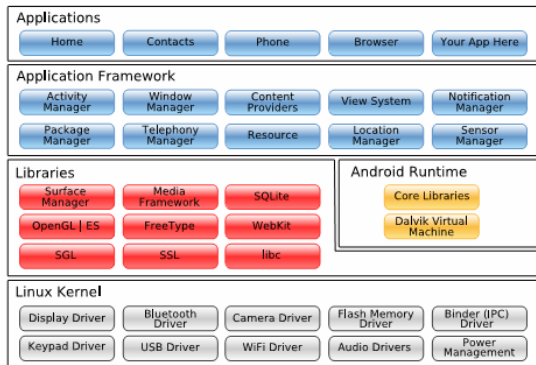


Figure1: System Architecture of Android

- When the application is installed, the Package Manager either grants or doesn't grant the permissions based on certificates and, if necessary, user prompts.
- Portability across a wide range of current and future hardware:
- High-quality graphics and sound:
- Automatic management of the application life

Cycle:

- Tons of built-in services out of the box:
- A component-based architecture inspired by Internet mashups:
- A truly open, free development platform based on Linux and open source:

B. MySQL and PHP (AMP) and IDE Technologies

The main part for the server side, we used a free of cost, open-source, and easily adaptable stack of open source software: Apache, which will be present in any of the IDE's which are used for the development of the applications, MySQL and PHP, abbreviated as AMP technologies. Our solution was tested both on Linux (LAMP) and Windows (WAMP) versions of AMP stack. Mostly used IDE's are Eclipse and NetBeans for Android Applications MySQL is a relational database management system (RDBMS) that runs as a server providing multiuser access to a number of databases. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements MySQL is owned and sponsored by a subsidiary of Sun Microsystems (now about to be acquired by Oracle Corporation). Free-software projects that require a fullfeatured database management system often use MySQL.PHP is a widely used, general-purpose scripting language that was originally designed for web development to produce dynamic content (web pages). For this purpose PHP code is embedded into the HTML source document and interpreted by a web server with a PHP processor module, which generates the web page document. PHP is free software released under the PHP.

We will be using an IDE by which we can be easily develop an android applications on adding some of the plug-ins for androids for the support of the DVM. We can use any DE(Eclipse,NetBeans) by which we can make an android

project with the plug ins related to those IDE's. The project will hold all of your source code, resources, third-party JARs, and related materials. The Android build tools—whether Eclipse-integrated or stand-alone—will turn the contents of your project into an Android package (APK) file, which is the Android application.

III. MOBILE CLIENT APPLICATION

A. Services Description and Mobile Client Interface

Our application is designed to be a mobile application that connects to a portal, providing news access from external sources such www.hotnews.com. and virtual community services. All users can own a blog with writing and reading capabilities, send and receive messages or add friends. As security solution authentication was implemented as a Login module (Fig. 2.a). First item when entering Main Menu (Fig 2.b) is "READ NEWS". Here using left and right directional keys you can navigate between news (Fig. 3.a). News are automatically updated from "Hotnews" website. On "BLOG" you can create your own blog (Fig. 3.b) by adding posts or reading other blogs. At this moment only text can be posted.

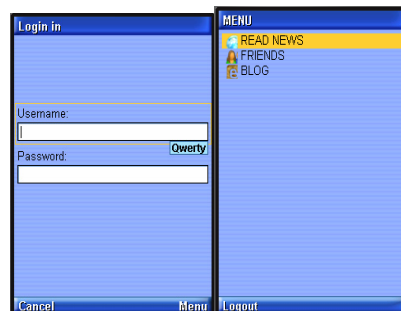


Figure 2: Application (a) Login and (b) Main Menu Screens

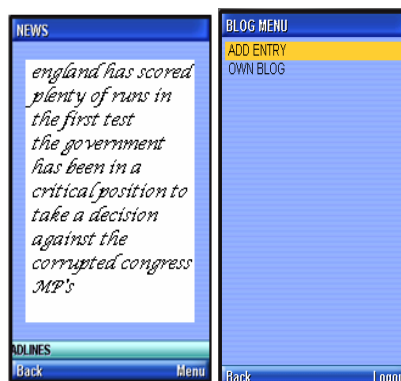


Figure 3: (a) News Access and (b)Virtual Community Screens

In "FRIENDS" menu (Fig. 4) you can add friends or list the entire world (list all users including persons that are logged in the application).



Figure 4: (a) Friends Virtual Community Screens, (b) Blogs Menu

B. Mobile Client Application Behavior

To describe the full behavior of the Java Mobile application we created a navigation map (Fig 5) showing the ways an user can follow from a screens to another for different service access.

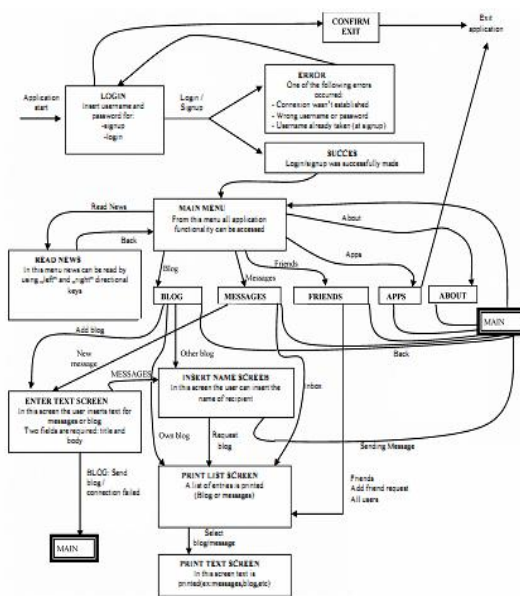


Figure 5: Navigation map for our Mobile client application

IV. COMMUNICATION SCENARIOS AND SERVICE ANALYSIS

A. Overall Client-server Communication Scenarios

At a simplified level the informational flux (Fig. 6) contains several steps: the message generated by application is sent (1) using the mobile phone technology available 3G,GPRS,etc, the carrier redirects (2) to the HTTP web address known internally by the application; Apache Web Server forwards (3) the request to command processor (PHP in our case); the PHP query database (4)and process content (4'); PHP receives requested content (5, 5') and streams out the information (6); now the process is reversed and the data is posted out (7) from the web server; the mobile phone operator transmits the data to terminal; data is then formatted in the desired way by the Android Mobile client application. For data transmission we use HTTP (Hypertext Transfer Protocol) over GPRS (General Packet Radio Service) or 3G. Fig 6.shows in a Message Sequence Chart (MSC) diagram the communication

protocol we created for the client-server data exchange for virtual community service. The steps are the following: Start application; Login successfully; Enter messages menu; Compose and send message; Exit application.

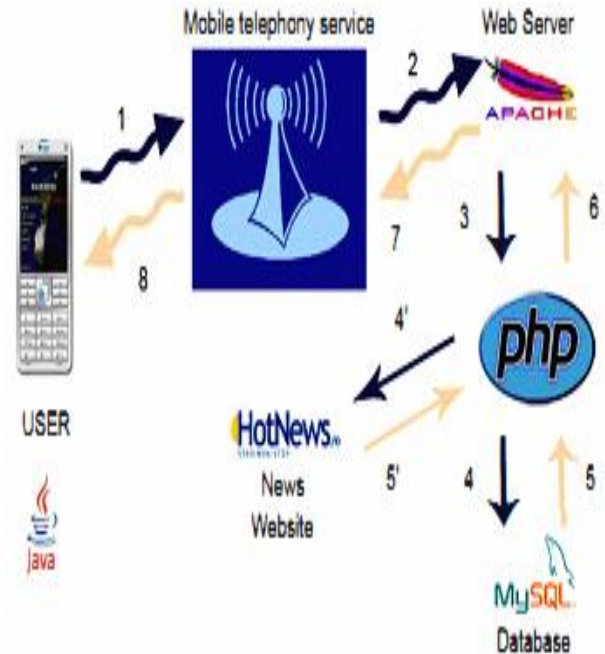


Figure 6: A simplified informational flow of the overall mobile application

B. News Access and Virtual Community Service Comparison

The application presents two main features: the area where you can read news and/or participate in a virtual reality (comprising all users). The news is read by PHP technology, parsing data from: .. www.hotnews.ro/PDAIactualitate..URL. In this way an array is made, spitted by HTML divs. The application users press the arrow keys to navigate between news. Each right key increase the number of article (moving to the next article). In fact is read the next item of the array containing the news. Pressing left key will do the reverse action. Reading information from the website is made by a simple PHP function (fopen (\$ url, "r")) where \$url is the address and "r" is read mode. This method can add more websites, and using a crawler can parse and other sites that have pages dedicated to mobile telephony. "Virtual reality" is made by you can make friends, send messages or post I read blog entries. At present there are many well-known virtual reality modules such as Facebook, Hi5, etc.

CONCLUSIONS AND FURTHER WORK

This study shows the advancement in data communication is essentially required in the mobile network. The mobile databases required to be made more powerful and the database management systems like SQLite, Microsoft's SQL Server CE, Cellica and Memento are essentially required to develop so that the purpose of objective of mobile database will be satisfied. The performance security issues are required to be enhanced. The mobile clients are yet not developed for these database management systems, which is a need of time.

We presented the design and implementation details of a mobile application supporting news access and virtual community interactive services, based on open technologies

such as Java programming language and Android supporting tools, MySQL database, PHP dynamic content and IDE. Our goal was to create an easy to use, mobile, interactive, flexible and extensible client-server solution, including a portable Android client and a Web portal access to the content. To prove these features, we chose to implement and compare two different kinds of interactive services, news access and virtual community.

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