COURSE REGISTRATION VIA INTERACTIVE
MOBILE PHONE APPLICATION

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Abstract

From the questionnaires several problems were found out usually faced every semester by Faculty of Information Technology and Quantitative Sciences (FTMSK) students while using pc-based online course registration. Initially developed to help minimising paper works and make it easier for students to register subjects, these problems highlight the needs of finding alternative registration method.

Due to its mobility and affordability, mobile phone is seen as the viable alternative platform to replace pc-based online course registration. As such, in this project, a mobile phone application based on JAVA language was developed. This application offers similar functions as the online system such as add and delete subject but with simpler methods. Hopefully with this application, the problems faced by student previously can be eliminated while at the same time maximising the potential of mobile phone technology in daily student life.

1.   INTRODUCTION

The Course registration via mobile phone is one project to develop an interactive application with Java 2 Mobile Edition (J2ME) language. The Mobile Information Device Profile (MIDP) is a key element of the Java 2 Platform, Mobile Edition (J2ME). When combined with the Connected Limited Device Configuration (CLDC), MIDP provides a standard Java runtime environment for today's most popular mobile information devices, such as cell phones and mainstream Personal Digital Assistants (PDAs).

CLDC and MIDP provide the core application functionality required by mobile applications, in the form of a standardized Java runtime environment and a rich set of Java APIs (Application Programming Interfaces). Developers using MIDP can write applications once, and then deploy them quickly to a wide variety of mobile information devices. MIDP has been widely adopted as the platform of choice for mobile applications. It is deployed globally on millions of phones and PDAs, and is supported by leading Integrated Development Environments (IDEs). Companies around the world have already taken advantage of MIDP to write a broad range of consumer and enterprise mobile applications.

The main objective this project is to develop one application in order to solve problems facing by existing course registration. This project enables an interactive function for student to do course registration via their mobile phones. Once downloaded into their mobile phones, this application enables student to select and choose the subjects they plan to register for the particular semester. The effectiveness of this project will be evaluated and tested based on random questions around several Faculty of Information Technology and Quantitative Science (FTMSK) student.

This application requires student to enable General Packet Radio Services (GPRS) services in their mobile phones. GPRS is a system of transferring information over the Global System for Mobile Communication (GSM) mobile network in small packet. Each packet is given an extra bit of information that tells the network

where it is meant to be going and how it fits into overall structure of the original packet. Currently GPRS is supported by all local telecommunication providers and can be activated with a minimal fee.

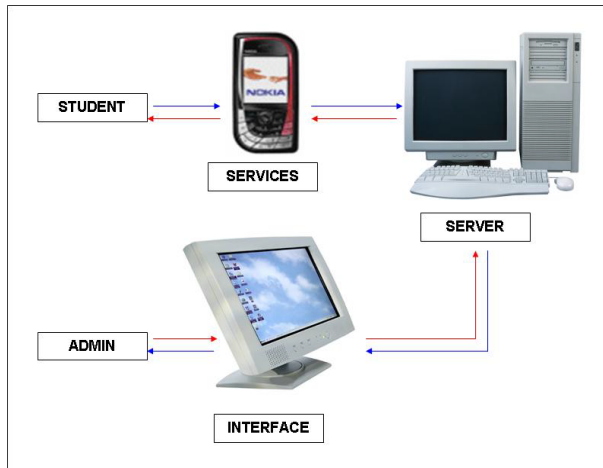The basic diagram of Mobile application system course registration is shown in Figure 1.

Figure 1: Block Diagram of Mobil Application system.

2. PROJECT OBJECTIVE

This project is done regarding to the main objectives. It is important to state the objectives of the project clearly; it is to ensure the project is kept on track. This project Course Registration via Mobile Phone is divided into four (4) objectives.

i. To identify students problem during existing online course registration.
ii. To offer alternative option for FTMSK student to register courses besides via the UiTM Student Portal.
iii. To develop one interactive JAVA application using mobile phone for FTMSK course registration.
iv. To evaluate the effectiveness the project with an interactive application using questionnaire.

3. PROJECT SCOPE

So many constraints to be considered while conducting this project thus, to make this project work and more specifically clear, it will be conducted on the following project scope.

This project is targeted for the benefits and use of FTMSK students. Although the target user initially is very limited, if the projects prove to be successful and commercially viable, this software or application can easily be tweaked and upgraded to cater to a wider educational users.

4. PROJECT SIGNIFICANCE

This project describes the software/application that use to doing course registration via mobile phone for FTMSK students. This application contains the most feature-rich and robust course registration management functionality of student software available for the mobile phone platform.

This project used:
1. Java 2 Mobile Edition (J2ME) as the core programming
1. Extensible Markup Language (XML) for database
2. Java Server Page (JSP) programming for admin interface.

Advantages of JSP:
1. The dynamic part is written in Java, not Visual Basic or other MS-specific language, so it is more powerful and easier to use.
2. It is portable to other operating systems and non-Microsoft Web servers such as Tomcat

Besides that, this application is compatible for all Java-supported series of mobile phone. Students can access the registration server anywhere and any time by using their own mobile phone.

5. METHODOLOGY

To make this chapter easier to understand, all discussions are based on the methodology overview to ensure that it follows the objectives of this research. There are five (5) main phases performed during this project. Every phase has its own significant and each phase divided into sub phase that consists of particular

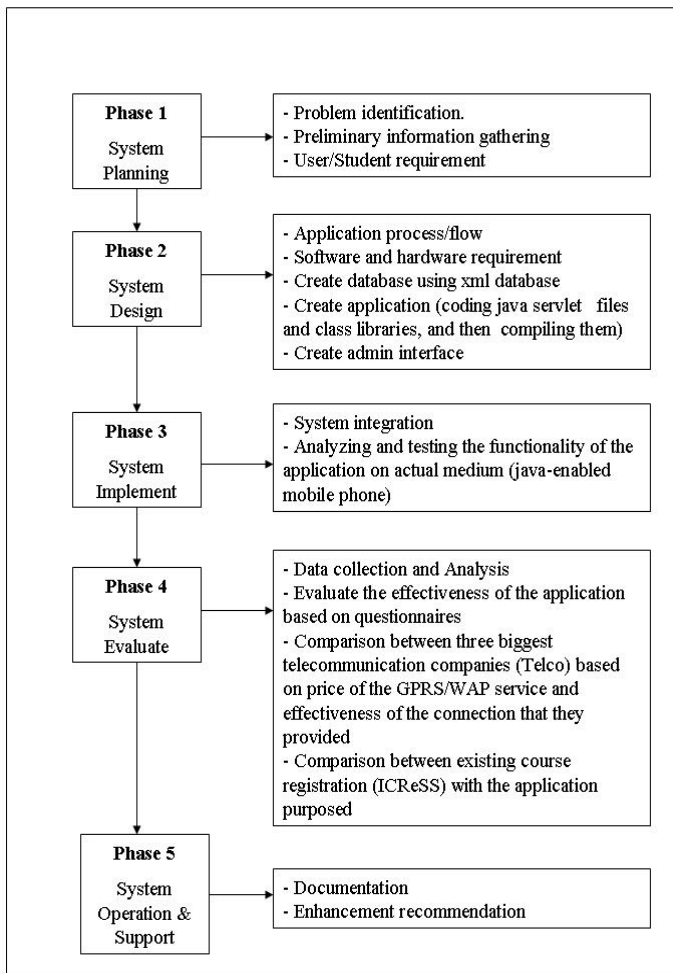related topics and tasks. The process diagram project methodology shown as in Figure 4.1.

Figure 4.1: Project Methodology Phases Diagram

5.1 Application used in Development

Java Toolkit Standard Edition Version 1.03. Tools included in this kit:
- Javadoc
- Jar
- Keytool
- Javah
- Javap
- Jarsigner
- Ant
- EXEs
- Find

HTML Editor, Macromedia Dreamweaver MX
- To create JSP files for the admin and xml files for the database

FTP Software, Flash FXP
- To upload the files to the server

Nokia Series 60 Software Development Kit (SDK) 2nd Edition
- Simulator for the java application

6. RESULT AND ANALYSIS

There are three methods that have been conducted which are: comparing GPRS service charges between telecommunication provider (CELCOM, MAXIS and DIGI) which indirectly identifies the cost needed by a student to do course registration via this application, identify the difference between existing system and the current application, and the last method is evaluating user acceptance through questionnaires.

From the analysis result gathered, we found that this project is an alternative for existing course registration system. This project also manages to achieve its objectives in terms speeds, reliability and cost-effective because this application provides of the following;

1. Rich user interface capabilities
   - Small display size and minimising a lot of bandwidth usage
   - Used the input methods for example enter the student metric number
2. Extensive connectivity
   - Student no needs to find cyber café/place to get the internet service
   - Wireless connection enables the student accessing the application anyway and anytime as long as the mobile has coverage of connectivity.
3. Over the air provisioning to deploy and update application dynamically and securely on the air
4. End to end security
5. Cost effective via GPRS connectivity

7. CONCLUSION AND FUTURE DEVELOPMENT

We have already developed and tested the application using the methodology discussed in Chapter Three. As a conclusion for this project, we found that this application manages to successfully achieve all of the project objectives. For our first objective, we had successfully identified problems faced by students who use existing course registration system. From the problems that have been gathered, we continue to work on achieving the second objective.

The second objective is to offer alternative option in order to solve problems identified in the first objective. We concluded that the alternative option is to create and develop an application which is easier to do course registration. Therefore we develop the interactive JAVA application based on mobile phones in the third objective. This application called interactive because it can be used anywhere and anytime through mobile phone. The last objective is to be able to analyze the effectiveness of this application in order to solve existing system problem.

The conclusion that we made from this project is JAVA application based on mobile phones is an alternative solution in providing the organization with the way to access directly to Course Registration system. Furthermore the application usage is low-priced, simple to configure, easy to use by student and effectively easy to manage by the admin. The effectiveness of connecting to the application system via GPRS which is faster than via online system made this project also manages to achieve its objectives in terms speeds, availability, reliability and cost-effective.

This project only concentrating on the FTMSK and only provide the FTMSK student information.

Following extensive testing and feedbacks gathered, there are several recommendations in order to improve the project for the future. There are;

1. Provides easier interface or function to view elective courses
2. Provides easier number insertion for login process
3. Provides sending the registration data into student email for reference function.
4. Provides additional info such as HEP contacts number for student if they encountered problems while using the application

REFERENCES

Martin de Jode, 2001,"Programming Java 2 Mirco Edition on Symbian OS, A developer's guide to MIDP 2.0".John Wiley & Sons Ltd, England.

Kim Topley; 2002, "J2ME in a Nutshell". O'Reilly.

Jonathan Knudsen; 2003, "Wireless Java-Developing with J@ME, Second Edition". Apress^{TM}, Germany.

Martin J. Wells; 2004,"J2ME^{TM} Game Programming" .Premier Press.

Flow chart for Course Registration Process (iCReSS) retrieved by July 22, 2005 from http://istudent.uitm.edu.my/stp/home/main2.asp

Programmes Offered retrieved by July 22, 2005 from http://www.tmsk.uitm.edu.my/

Series 60 Platform, S60 Devise retrieved by July 22, 2005 from http://www.series60.com/

J2ME: Mobile Information Device Profile (MIDP); JSR 37, JSR 118 Overview retrieved by July 22, 2005 from http://java.sun.com/products/midp/index.jsp

Wireless Java retrieved by July 22, 2005 from http://www.javaworld.com/

Remote Desktop for Mobiles retrieved by July 26, 2005 from http://www.desktopmobiles.com

J2ME Applications retrieved by July 26, 2005 from http://www.getjar.com

Mobile Phone guide GPRS retrieved by July 27, 2005 from http://www.carphonewarehouse.com

GSM Technology, GSM World retrieved by July 27, 2005 from http://www.gsmworld.com

PDAs Technologies, San Diego Public Library retrieved by July 27, 2005 from http://www.sandiego.gov/public-library/pctech/tech/hardware/pda/1.shtml

Free Java, Symbian, Palm and Pocket PC Software retrieved by July 28, 2005 from http://www.getjar.com/cgi/

JSR Overview retrieved by July 31, 2005 from http://www.java.sun.com

Java Card Technology retrieved by July 31, 2005 from http://www.java.sun.com

EmbeddedJava Application Environment retrieved by July 31, 2005 from http://www.java.sun.com

Embedding Tomcat into Java Applications retrieved by August 29, 2005 from http://www.onjava.com/pub/a/onjava/2002/04/03/tomcat.html

Using NetBeans, Connecting to Databases retrieved by September 14, 2005 from http://www.netbeans.org

Advantages of GPRS retrieved by October 26, 2005 from http://www.theanswerbank.co.uk/Article979.html

Series 60 2nd Edition SDK for Symbian OS retrieved by October 24, 2005 from http://www.forum.nokia.com/

J2ME Devices retrieved by October 27, 2005 from http://www.java.sun.com

What are the Advantages of JSP retrieved by November 11, 2005 from
 http://www.apl.jhu.edu/~hall/java/Servlet-Tutorial/Servlet-Tutorial-Overview.html

"Moving Java into Mobiles Phone – Industry trends"
George Lawton, June 2002
garber@computer.org

"Panduan Pengguna, Sistem Pendaftaran Kursus UiTM Semester 1 2005/2006"
University Technology of MARA
Retrieved by October 20, 2005 from http://istudent.uitm.edu.my/stp/home/main2.asp