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M-Learning Application for Android

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree in Computer Engineering Technology (Computer System) (Hons.)

by

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FACULTY OF ENGINEERING TECHNOLOGY

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

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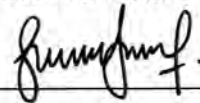
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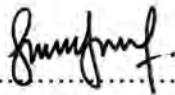
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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor in Computer Engineering Technology (Computer System) (Hons.). The member of the supervisory is as follow:

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(Project Supervisor)

....
(Co-Supervisor)

ABSTRAK

Sistem *E-pembelajaran* telah menjadi salah satu perkara yang penting untuk pelajar atau pensyarah di kolej-kolej. Sistem ini merupakan satu medium untuk pelajar untuk mendapatkan apa-apa bahan belajar dari pensyarah dan tempat untuk pelajar berinteraksi dengan pensyarah dengan rasmi. Walau bagaimanapun, sistem ini masih kekurangan ciri-ciri, jadi ia tidak digunakan sepenuhnya oleh pelajar itu sendiri. Untuk mengatasi masalah ini, sistem aplikasi *M-learning* perlu dibangunkan untuk membantu pelajar dan pensyarah berinteraksi antara satu sama lain lebih cepat dengan menggunakan telefon pintar. Setiap telefon akan mendapat notifikasi untuk setiap kemas kini daripada pensyarah dan pelajar boleh bertindak balas lebih cepat selepas mereka mendapat notifikasi tersebut. Dengan menggunakan sistem baru ini, pelajar boleh mempunyai akses kepada bahan kajian mereka dan berhubung dengan pensyarah dengan menggunakan alat telekomunikasi mereka. Kesimpulannya, aplikasi *M-learning* ini akan membantu pelajar untuk menjadi lebih produktif dan menjimatkan masa mereka dengan tidak perlu membuka *E-pembelajaran* setiap hari untuk memeriksa kemas kini baru.

ABSTRACT

E-learning system has become one of the important thing for student or lecturer in colleges. This system is a medium for student to get any learning material from lecturer and a place for student to interact with lecturers by formal. However, this system is still lack of features, so it's not fully utilized by student itself. In order to overcome this problem, M-learning application system need to be developed to help student and lecturer interact each other faster by using smartphone. Each phone will get notification for every update from lecturer and student can respond faster after they get notification. By using this new system, student can have access to their study material and connect with lecturer just in palm of their hand. In conclusion, this M-learning application will help student to be more productive and save their time by not open E-learning every day to check new update.

DEDICATION

I want to dedicate this to my parents who have supported me through all the journey and have been a great source of motivation and inspiration.

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I would like to offer my special thanks to Pn. Norfadzlia Bt Mohd Yusof and En. Mohd Saad Bin Hamid, my main supervisor and co-supervisor for their patient guidance, enthusiastic encouragement and useful critiques of this project. I would also like to thank to them for their advice and assistance in keeping my progress on schedule. I would also to thank all my survey respondent from UTeM, UKM, UniMAP, UTM, Giatmara, and other college for their supportive respond and useful idea to be put in this project. I would also want to thank my previous lecturer from Kolej Matrikulasi Teknikal Johor, En. Syaharuddin Bin Sabri for his support and encouragement throughout my study. Special thanks to my panel in this project, En. Aiman Zakwan Bin Jidin and En. Abdul Kadir. Not necessary, my thank for technician and staff in Faculty of Engineering Technology for their help in offering me resource for presenting this project. Last but not least, I wish to thank my parents for their support during my study.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

ADB	-	Android Debug Bridge
API	-	Application Programming Interface
ART	-	Android Run Time
GUI	-	Graphic User Interface
HTML	-	Hypertext Markup Language
IDE	-	Integrated Development Environment
JDK	-	Java Development Kit
OS	-	Operating System
PC	-	Personal Computer
PDF	-	Portable Document Format
SDK	-	Software Development Kit
URI	-	Uniform Resource Identifier
UTeM	-	University of Technical Malaysia

CHAPTER 1
INTRODUCTION

The term M-learning or Mobile Learning is a subset of E-learning. The different between both is the platform device which Mobile refer to the portable device like smartphone and tablet but E-learning are widely used in PC desktop, mobile device and any alternative system. The M-learning and E-learning refer to the same meaning, educational technology and distance education which focus on learning across context and learning with mobile device. One meaning does explain the definition of mobile learning is, "any sort of learning that when the learner is not at a fixed location, or learning that happen when the learner takes advantages of having mobiles technologies as the learning opportunities" (Kadle, 2010). In conclusion, by using mobile devices, learners can learn wherever and at any time.

The keywords 'mobile learning' does not simply explained when the student learning using mobile phone but it is conjunction to the 'mobile E-learning' which mean learner get involved with two main criteria such learn anytime and anywhere. The history and development of mobile learning has to be understood because sometimes people conclude that 'mobile' is mean by something that move anywhere. Some other people have better explanation to the word 'mobile' where the meaning is portable device or object that flexible to bring anywhere. When the word 'mobile' is used in 'mobile learning', that makes it stand apart from other type of learning. It is another learning experience that give learner opportunities to be (mobile) anywhere as long as they learn.

1.1   Problem Statement

U-Learn is a website created for students to ease the usage of the website, it is also a platform for the students to upload and download any education related notes or files. Despite the importance of U-Learn website to all students, the effectiveness and efficiency of this website are still not up to its maximum potential. Students are not really utilizing this website to its maximum potential simply because they are not surfing this site very often when they are mobile or away from a PC. Hence any new file uploaded and important announcements made by lecturers or by UTeM itself, sometimes do not reach the students in time. The role of U-Learn website in helping the students in their studies could be a failure if it is not fully utilized in the best possible manner. Hence, the main objective of this project is to develop a platform for the students to use the UTeM E-Learning website through a mobile device (Android). Besides that, this project revolves around the study of the primary usage of E-learning website to find out the key features that was include in the application. The interaction process will be easier as the M-Learning will be installed into their mobile phone as an android application.

1.2 M-Learning Advantages (KOŞAN, 2013)

(a) Educational Support

Using smartphones and tablet devices, students can easily accessed to the notes. They use their devices as part of their studies to get knowledge. Moreover, they can access to articles, diagrams, essays and other useful information which can improve student ability in the classroom.

(b) Interaction

Some student may have experiencing this situation that when a teacher calls upon them, they gets the small shock, thinking that he or she might be done something wrong. By using M-Learning, communication between teacher and student is simplify. The shy students now can communicate more often when they are in study. Teachers can also use mobile devices to get involved in students studies that require more attention.

(c) Management

Every student has their own way of learning. Several teacher or instructor note that each student requires different approach or strategies for learning. By using mobile learning, they able to learn in their own method. From that, they can enjoy and personalize their learning.

(d) Wider Access

Other than being able to access to educational tools online using their smartphones and tablet devices, students now have access to industry experts online. Students can read reviews and teaching blogs that prepared by professional in that field. From that, they have a chance to interact with experts even from their homes or classrooms.

(e) Special Education

Countless gadgets are being developed now a days to help peoples learning in their daily life. Mobile technology can also benefit those with special needs especially in reading and editing tools. Now that there are several apps that help students to learning.

1.3   Project Goals

This application will allow students to access the E-learning system at any time using only their smart phone, receive notification if new announcements are made or new files are uploaded by lecturers, view important announcements and download files (lecture notes, lab sheets etc.). This project will produce an Android based M-learning system which can be used by students and lecturers of UTeM. M-learning system will allow student and lecturer to access U-learn at any time using their smart phone. This application will able student/lecturer to and download files. Lecturer is able to make announcement and student able to view it. Student will able to receive notification regarding new announcement and files uploaded instantly. The analysis in Figure 1.1 and 1.2 showed the correlation between E-Learning and the proposed M-learning system.

Figure 1.1 Wired E-learning using desktop PC or laptop
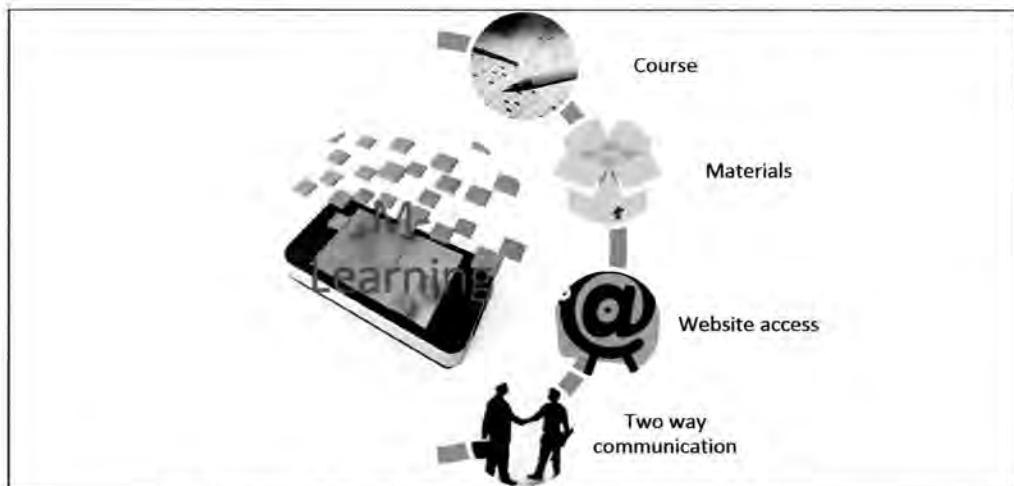
Figure 1.2 Wireless M-learning using mobile phone

From the study, E-learning and M-learning has some equal features that share together. This relation are advantage to this project as the expected result is to develop new mobile application based on features in E-learning system. Except this relation, there are also few advantage of using mobile as platform to used material in E-learning. By using smartphone and tablet, student can access to knowledge faster. Moreover they used their devices as education support equipment. In addition, they now have access to the note, article, or other material and able to study while waiting the class start or other free time.

1.4 Project Objective

After determine the problem that exist in the current E-learning, this project aimed to solve it by adding a few features to M-Learning application that was created in development process. This improvement come with need of student when they really appreciate to take advantage of study when in mobile.

(a) This project would provide an android application that giving student access to the E-learning content. Student can access the database but in an application method where they need to sign in once they install the application.

(b) This project could provide application that have a few features that doesn't provide in current E-learning. One of the important feature that must have is new feeds notification such new announcement by lecturer.

(c) A prototype of U-Learn UTeM is design to repace the current U-Learn UTeM.

(d) This mobile application can support all device that run Android as it operating system. This mean the mobile application could suite all type of Android device even in different screen resolution.

(e) This application also able to support student that really want to study anywhere using mobile device. This application can help them to use their time effectively.

1.5 Project Scope

This project will focus in Android application development. However some part of it will not be cover. Below is the list of scope that will be focus in this project.

(a) This application can support all Android version except Android version 3.2 and below it. This is because of its limitation to the library package provide by Java IDE and Google API.

(b) This project use Java SDK for its programming language and Google API as its main library. Its mean the Google API is embedded to the Java file.

(c) A prototype U-Learn portal is develop to replicate the U-Learn system in UTeM. This portal will be used to test the mobile app that has been develop by creating new

announcement and uploading new files. This new created announcement and uploaded file is then able to download from mobile app.

(d) This app is a read only application. User can only view announcement and download file at in database.

(e) This application also use MySQL database to store the data information. All function in app like upload username and password will be directly to this database. Both system for portal and mobile app are connected to the database.

(f) Notification will be sent to device if new message appear on database.

(g) This app is target specific for user like lecturer and student, no admin function provide in the app.

(h) The code build and debug into Android application installer and then will be transfer into android device for testing.

1.6   Project Limitation

(a) This application may lack of GUI due to simple graphic used and simple theme applied to make better performance.

(b) This app only can run on Android mobile OS

(c) The application is an online application and require internet access all the time in order to make it useful. But once user has download file in smartphone, it can be use offline until user delete the file.

(d) This application will be lack of function in future after time by time because of technology improvement make by smartphone manufacturer. A continuous update is need to improve this application.

(e) This application content are not shareable to all device because student need to login using their ID.

(f) This application does not provide file reader and file editor. Student need to install other application in order to open file such Words and PDF.

1.7 Thesis Outline

This project is a software application development and doesn't include any hardware. This project was divide into two part which is Part 1 and Part 2. All research report and analysis is combine in Part1. The other part is consider the development phase which less analysis and more to the code build.

Part 1 begin at February 2014 and end in June 2014. The content must include in this part is title of project, analysis, scope project methodology and result expectation at the end of project. A survey also run in this part as a supporting analysis to the project.

In part 2, there are code development as major content. Then, the project report was made after this project is done. All the feature change in development has been state in final report. Lastly the final report will be submit to the panel for observation as the project is successful or not. This project end in December 2014 and all the result and document compile and submit to University of Technical Malaysia.

CHAPTER 2
LITERATURE REVIEW

2.1   The System Comparison

The E-learning has a difference term with M-learning. For instance, E-learning give user to learn at any place and any time as long as user has computer or mobile phone that connected to the internet. E-learning come with many variety system like CD-ROM based, Intranet based, Network based and Internet based. The media content inside it also come with many type like text, audio, video, virtual environment and animation (Anon., 2011). While M-learning is describe by aurion Learning organization as "an activity that allows learner to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse." (Turner, n.d.). Both E-learning and M-learning system is full with learning experience and training can be done anywhere at any time. It is more like hands on learning.

2.1.1 The Current Portal System

This project take U-Learn UTeM as an example of the current E-learning system. This E-learning website is web based system used by student and staff in UTeM itself to check their profile for a certain purpose. For student, this U-Learn site is use to download any file given by staff of lecturer in UTeM. For lecturer, this U-Learn is used to interact with student and other lecturers in university. This is useful system that combine multiple feature into one website and give benefits to each user itself.

This U-Learn system also provide a useful advertisement on the page for student and lecturer to check. It is more like news of university update and show to each user that surfing this site. In each semester, students need to update the subject enrollment in order to subscribe the subject content given by lecturer. Student need to enroll subject manually for each subject.

However, this U-Learn are still lack some feature. Despite the importance of U-Learn website to all students, the effectiveness and efficiency of this website are still not up to its maximum potential. Students are not really utilizing this website to its maximum potential simply because they are not surfing this site very often when they are mobile or away from a pc. Hence any new file uploaded and important announcements made by lecturers or by UTeM itself, sometimes do not reach the students in time. The role of U-Learn website in helping the students in their studies could be a failure if it is not fully utilized in the best possible manner.

Not only that, the current system doesn't provide the notification to their user. Then the interaction between users is unpredicted unless the user is manually tell for that update inside U-Learn. This system is a web based system and currently not support for application in mobile device. User need to open their browser and login each time their surfing the system.

2.1.2   Proposed M-Learning System

The M-learning is not just E-learning on a mobile device. It's a big mistake to think that M-learning is revolution from web into mobile app because the M-learning that has been produced is an integrate version of E-learning where some feature has been implement into the app. Not only that, the file inside database can be download into mobile device and user can access that file even when they are offline.

The M-learning app also a runtime application that run in the background after user has login the system. It will be put in background application inside mobile OS and keep running to standby if there any new update in their profile. The application will give notification into user and user can access at the time they see the notification. By using this way, user can keep in touch to the M-learning system and also interact to the task faster than using the current system. This application will able student/lecturer to download files. Lecturer is able to make announcement in web portal and student able to view it in mobile app. With this mobile app student able to receive notification regarding new announcement and files uploaded instantly.

An analysis has been made through survey and the result is encouraging. Most respondent give the positive feedback on the last question which asking for more features they want in M-learning application. Many respondent want to have notification on their mobile if anything happen in E-learning database. Other than that, people are likely want to have friendly app that interact smooth and efficient.

2.2   Project Environment Analysis

2.2.1   Operating System

An operating system (OS) is software consisting of programs and data that runs on computers and manages computer hardware resources and provides common services for efficient execution of various application software.

For hardware functions such as input and output and memory management, the operating system acts as an intermediary between application programs and the hardware inside computer, although the application code is usually executed directly by the hardware and will frequently call the OS or be interrupted by it. Below is common features in OS:

(a) Process management

(b) Interrupts

(c) Memory management

(d) File system

(e) Device drivers

(f) Networking (TCP/IP, UDP)

(g) Security (Process/Memory   protection)

(h) I/O

2.2.1.1 Microsoft Windows

Windows is the most used Operating System today and used to have much third party association that corporate with them to make user have lots of experience using it. Most third party application that install in Windows are easy to maintain or update or remove from the PC. Windows is one of the multi-tasking and single-tasking operating system. The first model of windows is release in 1985 as version 1.0 until now with the latest version 6.3 on 2014.

Windows is also used on servers, control applications such as web servers and database servers. Microsoft has spent a lot in marketing and research & development money to demonstrate that Windows is capable of running in any enterprise environment, which has resulted in consistent price/performance records and significant acceptance in the enterprise market.

Comparison between Windows, Linux and Mac OSX is state in Table 2.1, 2.2, 2.2

Table 2.1: Advantage of Windows

Advantages of Windows	
Popularity	Most popularity
Handy	Easy to use. Most computer using this OS and easy to be familiar
Support	Application and driver support. Has huge number of application
Price range	Moderate price. Depend on its version
Installation type	.exe package installer. Most application available for download
Virus and spyware	Highly target by virus and spyware due to its weakness and un-secure environment

Table 2.2: Advantage of Mac OSX

Advantages of Mac OSX	
Popularity	Moderate popularity
Handy	Stable and secure
Support	Application provide by professional developers
Price range	Expensive. Come with its own hardware
Installation type	.dmg package installer
Virus and spyware	Less target by virus and spyware. Tough system

Table 2.3: Advantage of Linux

Advantages of Linux	
Popularity	Low popularity
Handy	Stable and secure
Support	Software support by Linux community, many update every 6 months
Price range	Free, no restriction, complete freedom to use
Installation type	.tar package installer
Virus and spyware	Less target by virus and spyware

After seeing this comparison, the OS that would like to be used in this project is Windows 7 for several reasons. This OS is the most popular system between people now day. Then the development code can easily share between another PC to PC. If the target PC that want to use for further development is using different operating system, the process of transferring data would be hard and some file that use in one of the OS cannot be open in other OS. Not necessary the software will be use need to reinstall in other PC must be downloaded again to match installation pack with that OS. Using Windows is one of the familiar thing in developers because it is easy to familiarize the environment. Other reason why windows would be the OS is because the price range is in the middle between Mac OSX and Linux. Mac OSX is too expensive and that's why it become less famous than Windows. Compare to the Linux, Linux is not easy to familiarize and less famous OS than Windows. The environment in Linux also hard to be adapted because most software and driver must be download from their official Linux community (Hafees, 2009).
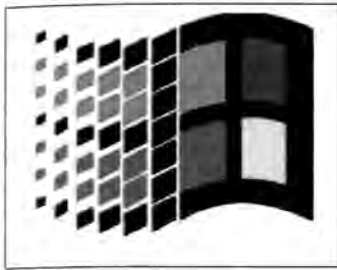
Figure 2.01 Windows logo (1992–2001)   Figure 2.02 Windows logo (2001 - 2006)   Figure 2.03 Windows logo (2006 - 2012)
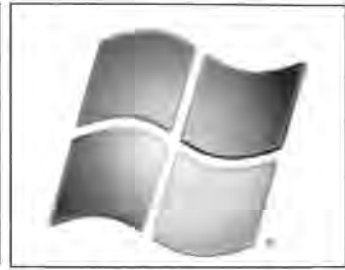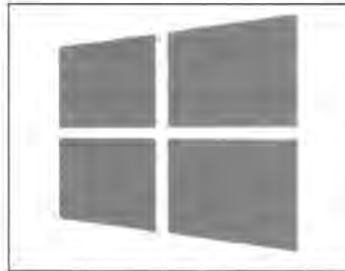
Figure 2.04 Windows logo (2012 - present)

In this project, windows is used as the operating system that hold the software for development. The software that will be install is MySQL database, Notepad++ Editor and internet browser. Windows has make an improvement to the new version of windows 8 where it used Metro-style and some additional application just to make sure developers can have integrated development environment. The software provide is like Visual Studio 11 and the price is $400-500 for professional version. However. There is other option for develop an application in Windows by installing third party open-source software. The Metro-style environment in Windows are suitable for users that want to develop web based application.

2.2.1.2 Android

Android is a mobile phone operating system that developed by Inc. Android uses Linux for its memory management, device drivers, process management, and networking (P. & M., 2012). The next level up contains the Android native libraries. They are all written in C/C++ internally, but all transitions be calling them through Java interfaces.

In this layer, there is Surface Manager, 2D and 3D graphics, Media codecs, the SQL database (SQLite), and a native web browser engine. Dalvik Virtual Machine supposed to runs .dex files, which are converted at compile time from standard class and jar files (Burnette, 2008).

Android also has natives libraries so it can be shared with application that using C or C++ language. It called Android Native Development Kit (NDK). This libraries compiled for the particular hardware architecture used by the phone. Normally preinstalled by the phone vendor. Developer can create new or use existing libraries to develop application. Below is the list of Native libraries provide in an Android OS:

(a) Surface Manager

(b) 2D, 3D Graphics

(c) Media Codecs

(d) SQL Database

(e) Browser Engine

Android has its Runtime environment where any activity in device can be read by using Dalvik VM. This framework is implementation of java and developed by Google's itself. It used to optimized mobile device runtime apps. In advance, the Dalvik VM runs .dex files which are more compact and efficient than standard .class files.

Android has its application framework itself just like other operating system. Framework is different with libraries where it does some work in classes and returns control to the client. This framework provide by Android is list below:

(a) Activity Manager

(b) Content providers

(c) Resource Manager

(d) Location Manager

(e) Notification Manager

When an Android application is on Runtime, it has 5 state where application is controlled. The five state is in Figure 2.05 below:
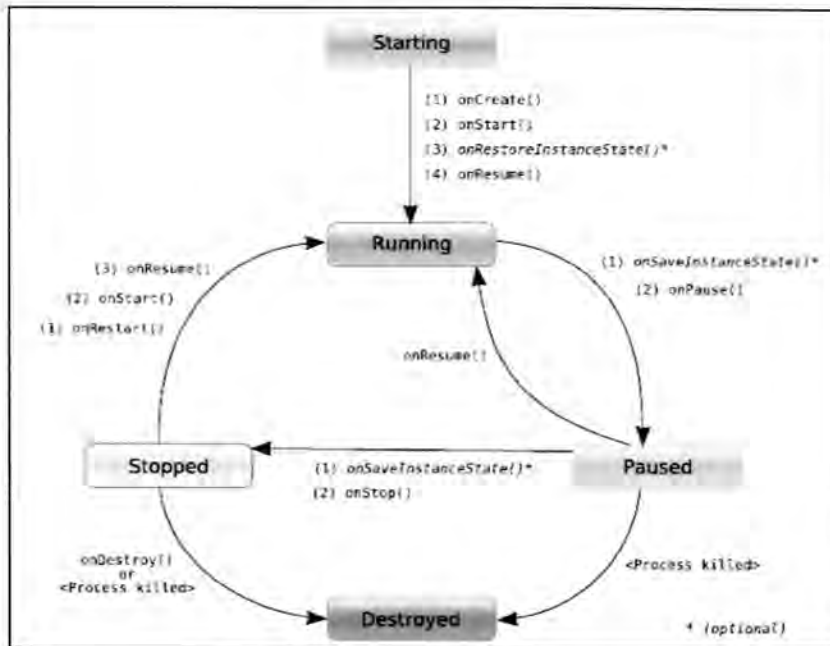
Figure 2.05 Android life cycle

Android is much more diverse operating system than other mobile OS if monitor from market. Android has been rapid grow over the past 4 years. That make it Android as the most used smartphone operating system in the world. The reason is Android doesn't release 1 phone from 1 company with 1 new OS for the whole year, they produce countless smartphones from numerous manufacture, adding few big update, throughout the year, continuously day-by-day. Android's give all companies that used the OS ability to customize depend on their standard unparalleled compared to Apple's and Microsoft's software. Android philosophy allowing the user to customize nearly every aspect of Android which most iPhone and Windows 7 users wouldn't dream possible.

2.2.1.3 Features

For technical details, the specification of the mobile OS is different because of its pattern and flagship to their company. Table 2.4 shows technical specification of Android, iOS and Blackberry OS.

Table 2.4 Comparison table between 3 mobile OS

TECHNICAL SPECIFICATION	Android	iOS	BlackBerry OS
LATEST VERSION	4.4	7.0	10.0
OS TYPE	Linux	Mac OS/ Unix	Mobile OS
LICENSE	Free and Open Source	Proprietary	Proprietary
CPU ARCHITECHTURE	ARM, MIPS, POWER, X86	ARM	ARM
PROGRAMMING LANGUAGE	C, C++, Java	C, C++, Objective-C	Java

In a few year of Android release on the market, the developer from Google Inc. is keeping the OS is update and bug free. It also designed the Android platform for use on tablet and smartphone even the screen is big or small or everything in the between. Android can maintain the same version of OS on all screen size (Reed, 2011). The successful of Google in making the Android OS is convincing the other field of course such new android app framework or IDE. For example is like Corona, PhoneGap and etc.

(a) New features on Android

Android latest release is 4.4 Kit Kat version. This version come with more uniform experience across devices. This version provides many new features that focus to improve user experience. For example is the lock screen has been improved to accommodate even more customization. Not only that, the status bar also been improved and guarantees to user.

(b) User experience of Android

There something that unique user experience that can be achieve using Android and it's not been on any other mobile OS. For example is like adding widget to the home screen. Most application include a widget as part of the installation package. A few years ago, there an Android version called Honeycomb has been build and it is design for device that has big screen like tablet. Unfortunately, having two different interface was giving bad experience to user. Then the new version of Android which is 4.0 Ice Cream Sandwich produced in order to terminate this gap so user will have the same OS version even in the different device.

(c) Android Developer experience compare to other mobile OS

Android applications can be created using any modern OS including Windows, Mac and Linux. A free Software Development Kit (SDK) is available for download from the Google developer site. The Android programming language is actually a set of Java APIs. Potential developers need to have a correctly installed version of the latest Java Runtime Environment (JRE) to create Android applications.

Although Android is Java-based, there are a few differences that even experienced Java developers may not be familiar with. Android programming is broken up into four components that work together to create every functional application (Wilde, 2013). They are Activities, Service, Content Provider and Broadcast receiver. The component that provide to iOS developer is different with Android component. It is because iOS application have their own additional feature that not will be provide in Android. Example is iCloud, music libraries and JSON parsing (Kyle Richter, 2013).

2.2.2 Database

Figure 2.06 MySQL logo

A database is a system used to store, organize, and retrieve large amounts of data simultaneously. It consists of an organized collection of data for one or more uses usually in digital form. One way of interpret databases involves the type of their data stored. For example: bibliographic, statistical and document-text. Digital databases are managed using database management systems software, which store database contents, adding data into database, searching index database and maintenance. MySQL is one software manager for relational database management system (RDBMS) that runs as a data server providing multiple user access to a single databases. It is named after developer Michael Widenius' daughter, my (Ralph Stair, 2012). The SQL phrase is stands for Structured Query Language.

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 was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation.

Free-software projects that require a full-featured database management system often use MySQL. For commercial use, several paid editions are available, and offer additional functionality. Some free software project examples: Joomla, WordPress, MyBB, phpBB, Drupal and other software built on the LAMP software stack. MySQL is also used in many high-profile, large-scale World Wide Web products, including Wikipedia, Google and Facebook.

2.2.2.1 Architecture

Database architecture consists of three levels, external, conceptual and internal. It is good to know because separating the three levels was a major feature of the relational database model. The external level is about how users understand the organization of the data in database. A single database can have any number of views at the external level even there are many data inside database. The internal level is about how the data is physically stored and processed by the main system. In internal level, architecture is concerned with scalability, performance, cost and other operational criteria. Last but not least is the conceptual level. It is a level of indirection between internal and external. The conceptual provides a common view of the database that is understandable by details of how the data is stored or manipulate, and that can simplify the various external views into a coherent whole.
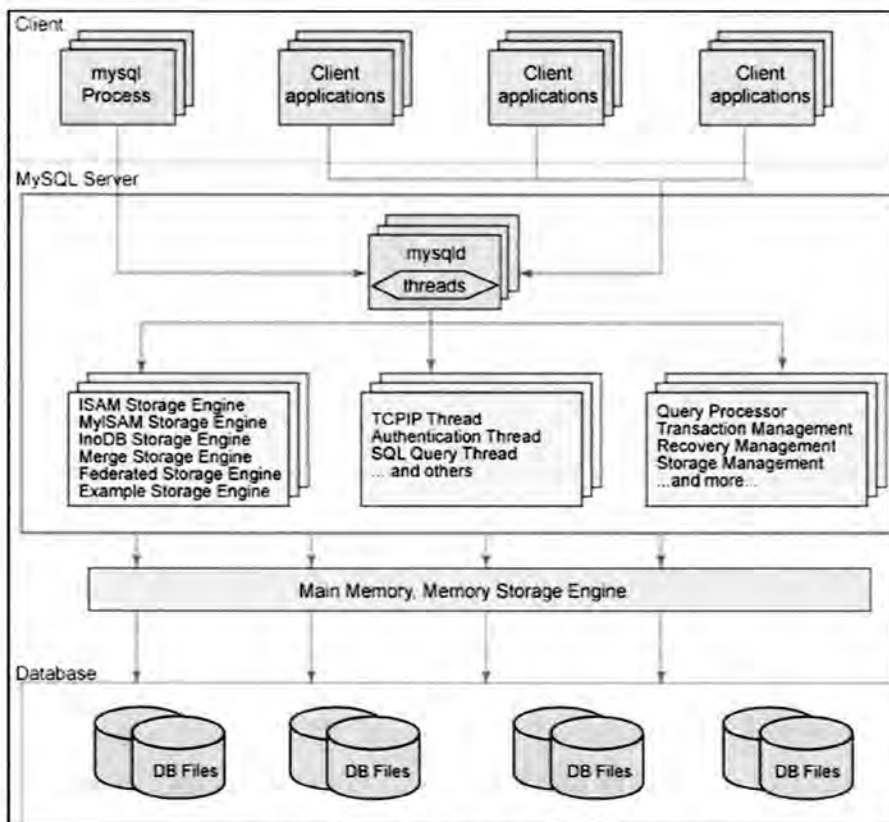
Figure 2.07 MySQL database architecture

2.2.2.2 Database Management System

A database management system (DBMS) consists of software that operates databases, providing storage, access, security, backup and other facilities. Database management systems can be categorized according to the database model that they support, such as relational or XML, the type(s) of computer they support, such as a server cluster or a mobile phone, the query language(s) that access the database, such as SQL or XQuery, performance trade-offs, such as maximum scale or maximum speed or others. Some DBMS cover more than one entry in these categories, e.g., supporting multiple query languages. Example of some commonly used DBMS is MySQL. Almost every database software comes with an Open Database Connectivity (ODBC) driver that allows the database to integrate with other databases.
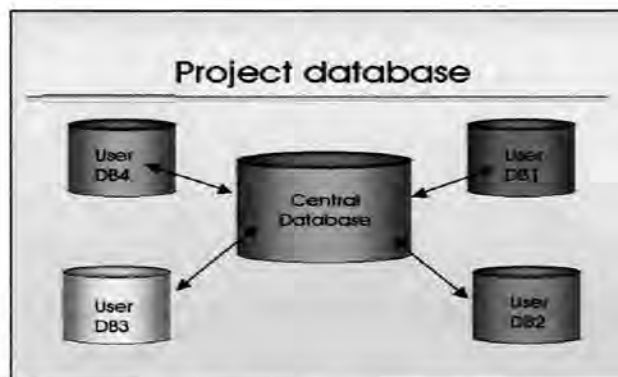
Figure 2.08 Database configuration in a project

In MySQL database, index is not necessary thing need to understand. Indexing is one of the technique to improve database efficiency. There are many types of index that share the common property so that they can eliminate the need to examine a query each time it run. By using Index in large databases, it can reduce query time that cost by orders of magnitude. Moreover, the simplest form of index also can sorted list of values that can be searched using a binary search, analogous to the index in the back-end. The same data in different database can have multiple indexes. For example, an employee database could be indexed by last name and ID.

Indexes will give effect to performance but not the final result. Database designers can add or remove indexes without changing application index, reducing cost apply on as the database grows and expends.

There are features provide by MySQL listed below:

- Transactions with the InnoDB, BDB and Cluster storage engines; save points with InnoDBSSL support As of April 2009, MySQL offered MySQL 5.1 in two different variants: the open source MySQL Community Server and the commercial Enterprise Server. MySQL 5.5 is offered under the same licenses.
- A broad subset of ANSI SQL 99, as well as extensions
- Triggers
- Cross-platform support
- Updatable Views
- Stored procedures
- Updatable Views
- True Varchar support
- Strict mode
- Query caching
- Information schema
- X/Open XAdistributed transaction processing (DTP) support; two phase commit as part of this, using Oracle's InnoDB engine
- Independent storage engines (MyISAM for read speed, InnoDB for transactions and referential integrity, MySQL Archive
- Sub-SELECTs (i.e. nested SELECTs)
- Replication support (i.e. Master-Master Replication & Master-Slave Replication) with one master per slave, many slaves per master, no automatic support for multiple masters per slave.
- Embedded database library

Many programming languages with language-specific APIs include libraries for accessing MySQL databases. These include MySQL Connector/Net for integration with Microsoft's Visual Studio (languages such as C# and VB are most commonly used) and the ODBC driver for Java. In addition, an ODBC interface called MyODBC allows

additional programming languages that support the ODBC interface to communicate with a MySQL database, such as ASP or ColdFusion. The HTSQL - URL based query method also ships with a MySQL adapter, allowing direct interaction between a MySQL database and any web client via structured URLs. The MySQL server and official libraries are mostly implemented in ANSI C/ANSI C++.

Example syntax in MySQL

Table 2.5 Most used syntax in MySQL

SQL Basics	SQL Administration	SQL Advanced
SQL SELECT	SQL CREATE DATABASE	SQL CONCAT
SQL WHERE	SQL DROP DATABASE	SQL SUBSTRING
SQL INSERT	SQL CREATE TABLE	SQL TRIM
SQL UPDATE	SQL ALTER TABLE	SQL AND & OR
SQL DELETE	SQL DROP TABLE	SQL IN
	SQL CREATE INDEX	SQL BETWEEN
	SQL DROP INDEX	SQL LIKE
	SQL ADD FOREIGN KEY	SQL DISTINCT
	SQL DROP FOREIGN KEY	SQL GROUP BY
	SQL CREATE VIEW	SQL AGGREGATE
	SQL DROP VIEW	SQL HAVING
		SQL ORDER BY
		SQL JOIN
		SQL OUTER JOIN

2.2.2.3 Comparison between MySQL and PostgreSQL

PostgreSQL is a 100% community-driven open source project, maintained by a worldwide community of more than a thousand contributors. It provides a single completely functional version, rather than the multiple different community, commercial, and enterprise versions that MySQL offers. Its license is a liberal BSD/MIT-type, which allows organizations to use, copy, modify, and redistribute code with only a copyright notice required.

MySQL has gone through changes in ownership and a fair bit of drama in recent years. It was first developed by MySQL AB, which sold itself to Sun Microsystems for a cool billion dollars in 2008. Sun was in turn acquired by Oracle in 2010. Oracle supports multiple editions: Standard, Enterprise, Classic, Cluster, Embedded, and Community. Some of these are free downloads, some cost money. The core code is GPL, and commercial licenses are available for developers and vendors who prefer not to use the GPL.

Platform and Workloads

MySQL:
- Slashdot
- Twitter
- Facebook
- Wikipedia

PostgreSQL:
- Yahoo
- Reddit
- Disqus

Both MySQL and PostgreSQL is able to run on most system such Windows, Unix, Linux, and Mac OS X. Both database are open source, so the only cost for testing them is hardware specification. Both are scale well for uses, ranging from small web system to big distributed systems. MySQL go further than PostgreSQL because it can use into the embedded space using libmysqld. PostgreSQL does not support embedded applications because it still using the old client/server architecture.

MySQL is confirm that they are able to provide speedy database back end for websites and applications and efficient in performing fast reads and numerous small queries. PostgreSQL is considered the almost perfect, full-featured, many data integrity check, no-nonsense workhorse for transactional enterprise applications and also strong ACID compliance. Each database here is faster at some tasks and MySQL work differently with different storage engines. MyISAM engine for MySQL is by far the fastest database engine, because it performs the fewest data integrity checks. MyISAM give great performance as a back end for busy read-mostly websites. However it is a disaster

for any read/write database containing sensitive data because MyISAM tables will inevitably become corrupted. The corrupted MyISAM tables can be recover using tools provide by MySQL but for sensitive data, InnoDB which is ACID-compliant is a better choice (Schroder, 2011).

Many organizations has choose to use PostgreSQL because it is good at protecting data and reliable as a database host manager. However MySQL is more flexible and has more options for being tailored for different workloads. It has been used by most famous social website like Facebook and Twitter.

2.2.2.4 Database Inside Android Device

An additional database system need to be used in Android for saving data and file in the smartphone. Luckily the Android NDK has provide this feature which is SQLite database and this database system is ready to be used anytime even when offline. By default the SQLite function can be access at directory of android here: com. android.contacts.webdatacontacts. The database variable that normally use in application is $ANDROID_HOME (Zigurd Mednieks, 2013). This database can deal with the performance of the app because it is faster when using SQLite than using normal data filing system. Other than that, the SQLite system is easy to use because the system already inside the Android OS and developer just need to access and declare the data, no building database require. Also this Database is free since the Android OS is a free source OS and developer can use SQLite to its maximum potential as their developing material (Rittmeyer, 2013).

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2.2.3 Java Android SDK

Figure 2.09 Eclipse Luna logo

Criteria in choosing the framework.

Deciding the Platform Tool before start a project is important as it will affect the performance of the project. Much worse is when the project completion need to extend in order to complete code troubleshooting or other problem. Then it was good step to compare which framework is best to start work. For make sure this project was succeed, eclipse software has been choose as compiler for mobile apps development. However eclipse is just a compiler for compile certain language like Java. In order to start develop app using eclipse, there are few plug in need to be installed into eclipse. This plug in or other name as ADT is some sets of library that give user to use for building an app. Below is the list of ADT should be install in eclipse software.

(a) Android SDK

(b) Android debug bridge (adb)

(c) Android Developer Tools and Android Studio

(d) Dalvik Virtual Machine

(e) Android Run Time (ART)

The eclipse software is a good IDE to develop skill and it is easy to make analysis when something went wrong. For example, if the code make an error but the error cannot seen on interface, then the eclipse can help by providing Log Cat data to developer see the process inside phone. This mean eclipse give a full developer experience to all its user.

Other than that, as an app developer, it was easy if the IDE can show the file and directory inside app. This feature was provided by Java SDK where all the directory and value on project can be see and customized. Some file that require a customization is

main class activity, manifest file, string file, R file and layout file. Figure 2.10 show the anatomy of Android application.

Figure 2.10 Anatomy of Android application

2.2.4 REST API

REST API or Representational State Transfer is the interface constrains defined between client and servers. It enable each client and server part to evolve independently. There are four guide principles of the interface for this API that used in this project:

(a) Resource based – individual resources is request using URI. The resources are conceptually separate from the representations that are return to the client. By using this method, the M-learning application (client) can retrieve data from server that expressed in HTML, XML, JSON data.

(b) Manipulation of resources through representations – when client hold some data as representative to data resources, it can have enough information to modify or delete the resource on the server. This mean M-learning app can use this functionality to read, update, or delete data on database server.

(c) Self-Destructive messages – each message include enough information to describe how to process the message.

(d) Hypermedia as the Engine of Application State (HATEOAS) – client deliver state via body contents, query- string parameters, request headers and the requested URI. Services deliver state to clients via body content, response code, and response headers.

The uniform interface differentiate clients from servers. That's mean the separation of concerns is like, clients are not concerned with data storage, which remains internal to each server, then the portability of client code is improved. Servers are not concerned with the user interface or user state, so that servers can be simpler and more efficient. Servers and clients may also be replaced and developed independently, as long as the interface is not altered.

2.2.5   Application Development Process

In this project, an Android application will be created at the end of project. The development of app will through a few step. The first step is to create an HTML program with jQuery and CSS languages. This program will created using software Notepad++ in windows and to build the program, Chrome browser will be used. Chrome will act as virtual output display and the expected result will display on it. After complete creating the program, this program will be upload to Adobe PhoneGap for build. Lastly the final step is to download the output package from PhoneGap. Now, this package able to be installed in any Android device.

2.3 Feasibility Study

A feasibility study describes whether or not the proposed system is worthwhile. A short feasibility analysis were.

(a) Technical feasibility
(b) Economic feasibility
(c) Behavioral feasibility

(a) Technology in technical feasibility

The valuation is based on an outline design of software requirements in terms of Processes, Input, Output, Programs, Fields, and Procedures. The valuation can be quantified in terms of volumes of data, frequency of updating, and etc. An investigation should be make whether the new system will perform perfectly or not. Considering our project if is technically feasible. M-Learning app using Android which is a latest idea and the mobile applications here are developed in the Adobe PhoneGap.

(b) Economic feasibility

Economic analysis is the most frequently used method for evaluating the effectiveness of a new system. More commonly known as cost/benefit analysis, the procedure is to determine the benefits and savings that are expected from a candidate system and compare them with costs. If benefits outweigh costs, then the decision is made to design and implement the system. Considering our project the android is one of the best operating system in mobile phones used to develop the applications which runs on the mobile platform, which serves people a good scope of development in the software field and also it attracts the users. Android mobiles weigh low cost then i-Phones and other mobile operating system. Low cost easy access to the internet with search engine App's and fast fetching results now within your mobile.

(c) Operational feasibility

Operational feasibility is a measure of how well a proposed system solves the problem occurred before, and takes advantage of the opportunities during scope specify and how the system satisfies the requirements state in the requirements analysis phase of system development phase. Proposed system here is being developed in the Eclipse 4.4 which is the latest version of Java Eclipse which supports Android platform. Eclipse is an integrated development environment (IDE) add with Google Android API, particularly for the Android mobile programmer. Eclipse offers built-in project debugger at Dalvik monitor for modifying and analyze activities happen in an applications. Eclipse plus Google Android API includes an interactive debugger allowing developers to send compilation package to phone without seeing the installation process.

CHAPTER 3
METHODOLOGY

3.1 Project Requirement

The selection of tools in this project are very important in making this project meet the target result in the end. The tools including hardware and software but more importantly the hardware must works well using the software selected. When selecting hardware, the size and requirements are also important in order to ensure software development run well.

3.1.1 Hardware Requirements

Table 3.1 Hardware requirements

HARDWARE	TYPE	SPECIFICATION
PC	Processor	Intel Pentium 4 and above
	RAM	512MB and above
	Hard disk drive	10GB and above
MOBILE	Android	v1.6 until latest
		Can install APK packages

3.1.2 Software Requirements

Table 3.2 Software Requirements

TYPE	SOFTWARE
OPERATING SYSTEM	Windows XP or any latest version of Windows
IDE	Notepad++ & Eclipse
LIBRARY	Java Development Kit (JDK), REST API, Google API
WEB BROWSER	Mozila Firefox, Google Chrome or any browser
SERVER HOSTING	CPanel
DATABASE	MySQL
COMPILER	Adobe PhoneGap Build

Project was developed in Eclipse software. MySQL is use as back end part where it hold data in server so portal and mobile app can use it. Also it has broad support for the vast majority of all modern desktop, smartphone, e-reader, and tablet platform. Even the feature phone and older browser are supported because of their enhancement approach.

To work with software development, Windows is the prefer operating because it support many type of software and also has many third party driver that required in this project. For example of driver is Java Development Kit (JDK). This driver is require in order to run MySQL database in PC.

3.2 Method of Collecting Data

Method of collecting data divide to four way as listed below.

(a) Survey

(b) Literature review

(c) Analysis on current system

(d) Discussing with supervisor

3.2.1 Survey

A survey has been run to ask respondent the specification that actually student want in an M-learning app. By doing this survey, a data can be collect and will be analyses to extract what is actually feature that almost need in this app. Data collected also will be divide into two category where it used to enhance user interface or enhance the functionality of the app. This survey consist of seven question like below.

(a) What is your frequency surfing e-learning website in a month?

(b) What usual thing you do when you surf e-learning website?

(c) Do you prefer to use e-learning in mobile?

(d) How many time do you used mobile device as part of study?

(e) Do you prefer to use mobile app rather than e-learning in desktop pc?

(f) Which one do you like:

(i) Open browser in smartphone to surf e-learning

(ii) Open application in smartphone to use M-leaning

(g) What additional features you want after changing E-learning to M-learning

Survey is continue run until the next phase which is code construction. The date is at the end of September 2014. This is due to preparation for design phase to be made and make code development easier.

3.2.2 Literature Review

A lot of review has been made from many source to make comparison and then decide the best system to be used. This review is from multiple type of document like journal, technical report, research paper, website, book and etc. some data has been extract into this report including its source link as reference.

3.2.3 Analysis on Current System

The current system is e-learning web based application that applied to web browser if user want to open it. Then the function of this e-learning will be reconstruct into this app as to maintain the old feature and add some additional features. Additional features that will be added is collect from survey. Figure 3.01 is the example of current E-learning system that used by U-Learn Utem (Pandi Khalid (Administrator for UTeM E-Learning Platform), n.d.).
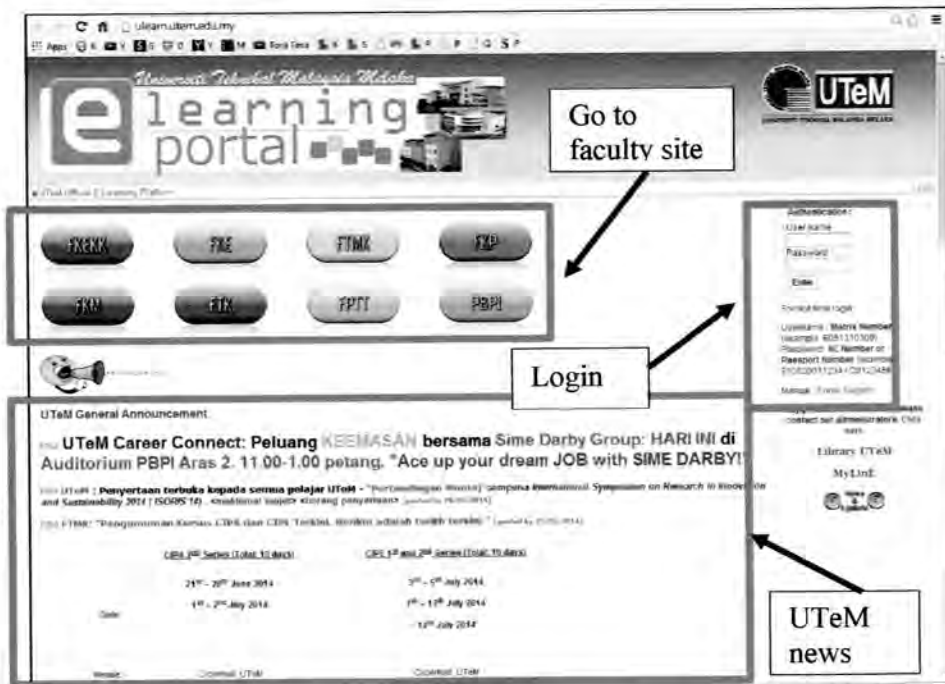
Figure 3.01 U-Learn UTeM is an example for E-learning system used now day

3.3 Introduction to Rapid Application Development

The RAD model is focus on short development cycle time. This model can suit many steps from waterfall model because rapid development is achieved based on construction phase (Tilloo, 2013). If the project requirement is well understood and project scope is known, the RAD process enable software successfully created within the time given. Here in Figure 3.02 are the RAD model with its phase step by step.
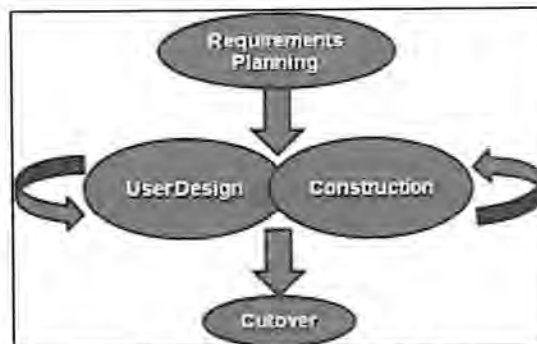
Figure 3.02 RAD model

By using this model, this project have some advantage because RAD model has its benefits to developer. RAD model is flexible and adaptable to change. It is because RAD model is parallel system between user design and construction. Developer can do two phase at the same time. Then report output of software project can be compared with the existing report to check whether software is meet the requirement and expected result. Moreover RAD model generally is short development cycle. The part of result can be see while construction is made. After the construction complete, the cutover phase is meet and all the changes in construction will be count here.

RAD model used less human resources and it's suitable for this project where only a person work on design and construction. However, in RAD system each process should be properly modularize otherwise it will create a lot of problem.
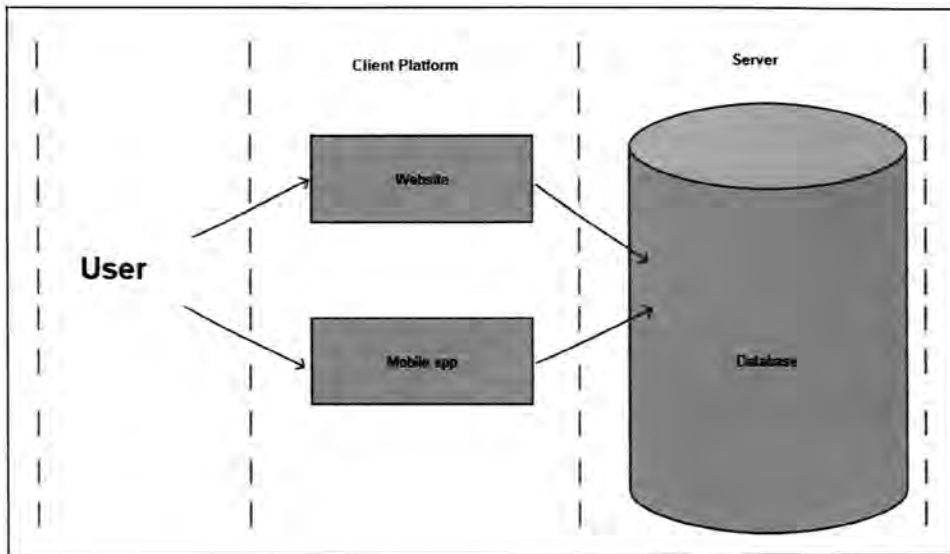
Figure 3.03: System design of M-learning

3.3.1 Requirement Planning

In requirement planning phase, developer should discuss with supervisor (client) on software needs. This phase focus on listing the system requirement of the system that will be build. Not only that, project scope also will be discuss in order to specify the need and necessary thing in software. This phase also focus on client need which software that want to be create is fully functional to student or not. As the topic of project is M-Learning system, the current E-Learning system need to be improve so student will feel the system are useful and helpful to student. This phase also the stage that run the survey to each student to analyst the requirement of this software. Any useful idea in survey respondent form should be add as new features in this project.

On 20 May 2014 the total of respondents collect is 35 peoples and they are from different university or college. The data collect is attached in appendix.

3.3.2 User Design

A use-case diagram has been made to specify what object is need in this application. Below in Figure 3.04 is the use-case diagram made by StarUML software.
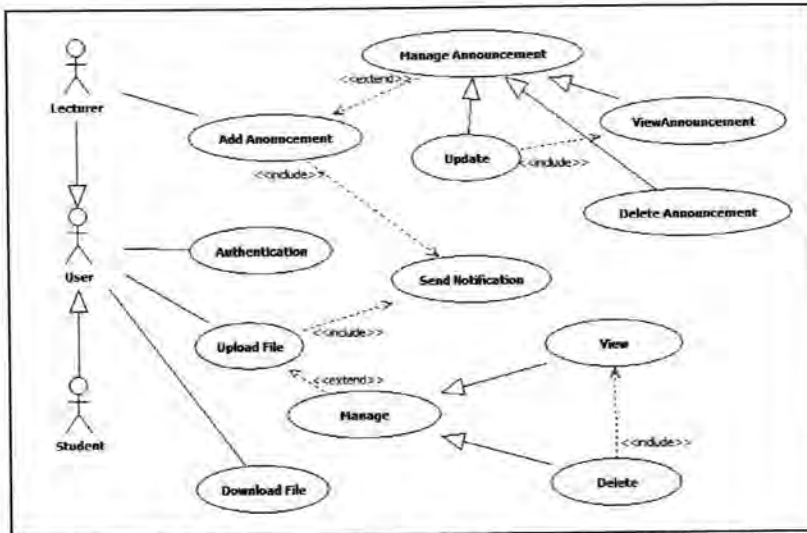
Figure 3.04 Use-case diagram for U-Learn application

From Figure 3.04, design can be made easier because use-case diagram has been construct and connection between object is determine in specific. Here are the sequence diagram that follow the use-case diagram above. This sequence diagram in Figure 3.05 also made by StarUML software.
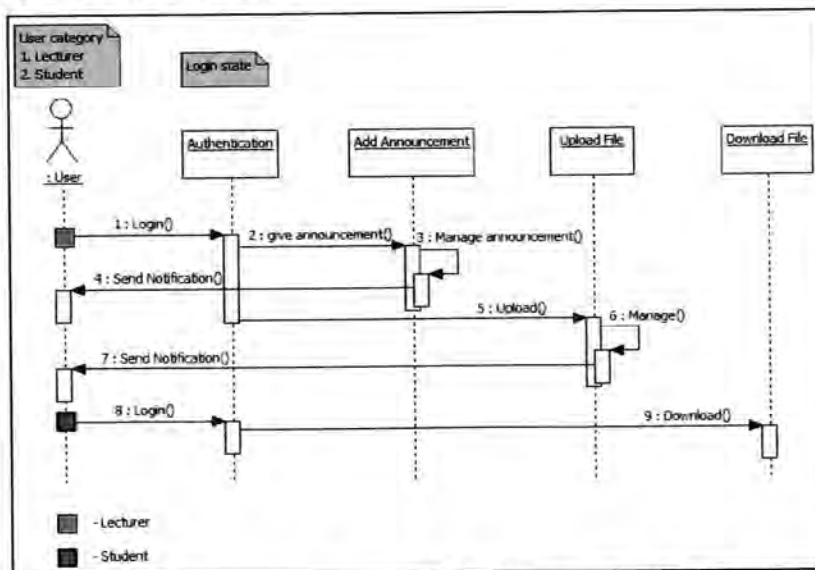
Figure 3.05 Sequence diagram for basic operation in U-Learn

In this phase, modelling of software program will be start. Any design and feature will be modularize into specific before start to construct program. An additional software will be used to design the layout of this application. The software is Pencil Project develop by Evolus team as a free software for all. Anyone can download this software and start to create their own software layout. Figure 3.06 show the GUI of application. Many software layout are available specific to the target platform such Android, Windows, and iOS.

Figure 3.06 Pencil Project software used to design layout

The app User Interface design has been start and Figure 3.07 are the expected design after construction phase complete.

Figure 3.07 Design Layout of app

This layout are subject to change depend on improvement or other criteria. However any design changes does not mean feature in this app will be removed.

3.3.3 Construction

In construction phase focus is turn onto program and application development task. There is a lot of task to do such coding, modularized program, unit integration and testing. Process must through the procedure otherwise result will be not acceptable or failure occur. Figure 3.08 shows the process diagram that should be follow in construction phase.
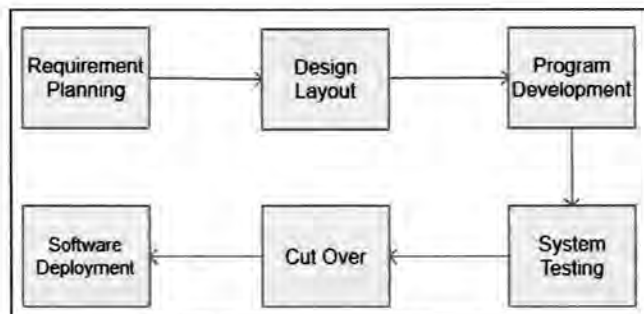
Figure 3.08 Construction stage by stage

In requirement planning, the criteria and data is collect from earlier phase of project because all the studies, survey and analysis is collect in the beginning of project. Moreover, in RAD model, project development is parallel with design stage, so whenever the new features or idea come will be considered and add to the construction stage instantly.

Same goes to the design layout stage where data collection will take from design phase. Each page is design depend on its functionality. For example is like login page where student need to enter id and password to enter Home Screen.

Then the program development stage is the process to do programming in back end of software. Some feature in app need an algorithm such password matching, day calculation and data receive from database. This phase is the hardest part where the program need to follow specific requirement state in design before. The easiest way to done this is by modularize each function in application into many part so process to compile the program can be made each time a module is complete.

After done making the code, all entire program need to test to check whether the program is meet the requirement or not. If a part in program is error or bug, program need to be recheck until it met bug-free program.

At the construction of this software, design still can be improve and program will be alter. Then the final result will be remake if any additional feature has been add into project. The last thing after done this is to transfer data result into cutover phase for further process.

3.3.4 Implementation (Cutover)

This is the final phase where all phase before will be collect and recheck. This phase complete by the following task.
  (a) Data conversion
  (b) Full scale testing
  (c) System change over

In this phase, the system will take full analysis in order to make program is run efficiently without error or bugs. Any data conversion will be replaced with better one if have. Then full scale testing is run onto whole program. Then any change over will be restate into full report as new improvement.

There are some implementation process that required to make this project success. Explanation after this is about back end of the web page where the code hosted; refer Figure 3.09.

41
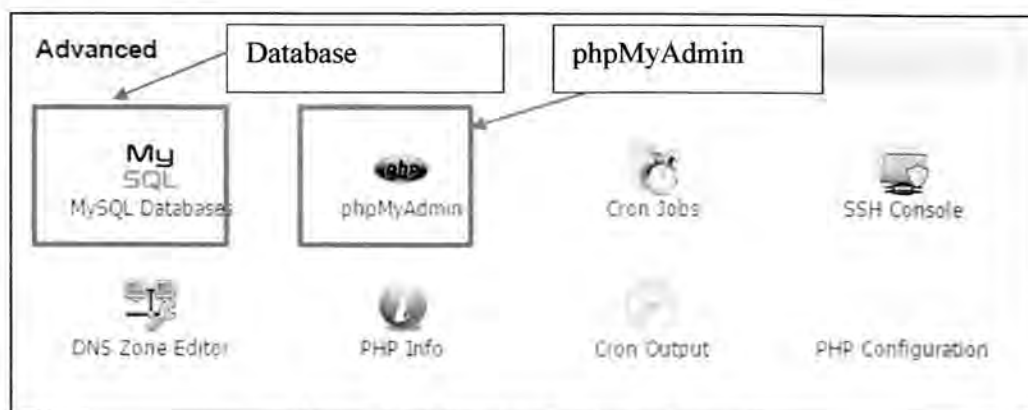
Figure 3.09 Advance section of cpanel

MySQL database is used in this project (Figure 3.09) at phpMyAdmin page. Here the data and content of the portal is stored. phpMyAdmin is used to view or edit data inside database table. This database are access by both platform either from web portal and mobile app. The database is shareable from all device as long user has the ID to sign in.
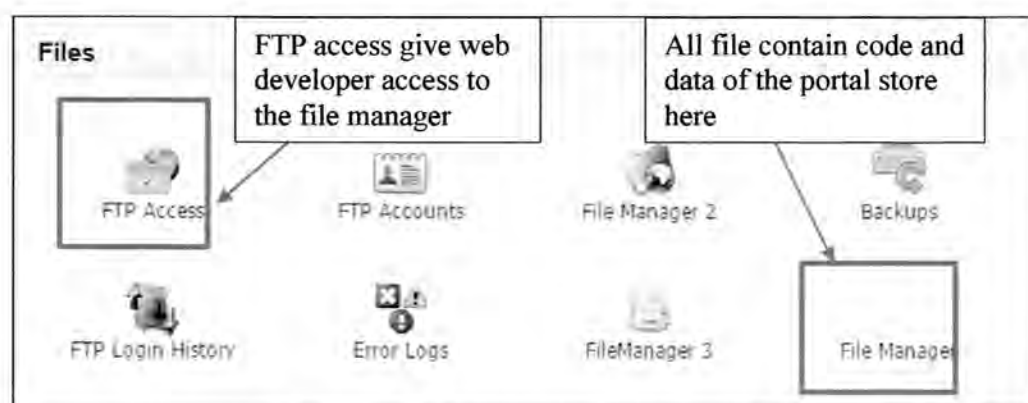
Figure 3.10 File section of this cpanel

Web developer has three option to choose which File manager to use (Figure 3.10). However the different between those options is only at its interface. FTP Access give developer access file manager in cpanel just in remote application such Tomcat server and FileZilla. By using those software, web designer can access file manager content just in their desktop without opening browser.

Figure 3.11 File manager in cpanel

This file manager is look like Windows Explorer in windows (Figure 3.11). Here developer can create directory, copy and paste file, create, edit and delete file. Usually main page of the portal or web could be put here so it can all directly main file, '.php'.

Figure 3.12 File use for mobile app

Figure 3.12 show the mobile section that put in one folder inside the same server. This file contain the response that used REST API to get client value and return back the value in database. For example is login process required client app to send and compare data to server and then response with the result.

Table 3.3: File that used for communication between client and database server

File	Function
about.php	Accept request from client to read data about user. The data such username, email,
db_config.php	This file use to store database configuration such database host, database name and database password
db_connect.php	This file is use to make connection from directory cpanel to database. The configuration of database is take from db_config.php
login.php	This file use when a client want to sign in to portal. This file have a function to take username and password from client and compare to data in database
register.php	This file is use to register user. However this mobile app does not able to sign up for user and this function is spare for future version of this app
testpost.php	This file use to receive username of client and response the message content in database.

3.3.5 JavaScript Object Notation (JSON)

When using Eclipse software, the API to use for connecting client to database is JSON. JSON make communication is easy for mobile phone to parse and generate. It is based on a Javascript programming language and the error that program make got clue message which can help a lot. Figure 3.13 show that connection error when trying to parse data from client to server. Figure 3.14 show that the connection is successful. This message is send from server.

```
1067   1067   com.example.phonebook   Choreographer     Skipped 85 frames!  The application may be doing
1067   1085   com.example.phonebook   Create Response   {"prenom":"Data not found","success":0}
1067   1067   com.example.phonebook   Choreographer     Skipped 99 frames!  The application may be doing
388    402    system_process          Choreographer     Skipped 39 frames!  The application may be doing
```

Figure 3.13 Log Cat message to see response from server. "Success:0" is a bad

response

1067	1067	com.example.phonebook	Choreographer	Skipped 53 frames! The application may be do
1067	1086	com.example.phonebook	Create Response	{"message":"Login successfully.","success":1}
388	568	system_process	ActivityManager	START u0 |cmp=com.example.phonebook/.Welcome
1067	1067	com.example.phonebook	dalvikvm	GC_FOR_ALLOC freed 112K, 19% free 3872K/4760K

Figure 3.14 Log Cat message to see response from server. "Success: 1" mean connection is complete without error

3.3.6   MySQL Query

MySQL database is use in this project to store data in server. To retrieve this data, create mySQL query and select data needed from which table. Figure 3.15 show mysql query used for login page.


```
mysql_query("Select * from
login where
mobile_number='$mobile_number
' and password='$password'");
```
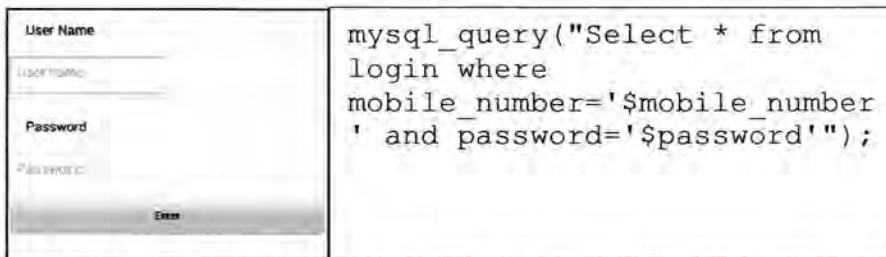
Figure 3.15 This username and password is direct to server to checking process with database

3.3.7   Download Manager and Hyperlink

This app provide download function which give user access to document and save it inside their phone. There was plenty of reader for Android user such Microsoft Office Mobile, quick office, OpenOffice and etc. to complete this operation, few line of code must be sign to our code. Figure 3.16 show the code that use to call download function in Android OS. This function is already implement to Android since version 4.0.3 Ice Cream Sandwich.

```
Uri uri=Uri.parse("http://ulearn.utem.edu.my/[directory for
download]");
DownloadManager.Request request = new Request(uri);
long reference = downloadmanager.enqueue(request);
```

Figure 3.16 The function DownloadManager is directly call from app

Beside download function, this app also use hyperlink function which usually not provide in other app. This is because the hyperlink function is put in html language where not preferred in java language. However hyperlink is very useful in this app where client just need to call browser to open each link provided and save memory from using a lot of space. Other than that, hyperlink also make app more intuitive to use because user can see the link provided and know that the link will go somewhere else user don't know.

3.3.8 Notification

Beside useful content and accessibility to the portal content, this app also give user a notification for new message that receive in portal. This mean the application must be running in background so it can continue receiving new notification in time. This function is already provided in Android OS. The way this thing is implemented is by calling Notification Manager into this app and retrieve it in periodic time. Figure 3.17 show the Notification Manager function that used in this app.

```
PendingIntent contentIntent = PendingIntent.getActivity(this, 0,
notificationIntent, 0);
Notification notification = new Notification(icon, tickerText, when);
notification.setLatestEventInfo(context, contentTitle, contentText,
contentIntent);
private static final int HELLO_ID = 1;
mNotificationManager.notify(HELLO_ID, notification);
```

Figure 3.17 Notification manager provide by Android

3.3.9 Error Exception and Handling

Some function on this app require an error exception handling. This thing is needed for most of app with internet access functionality or other hardware with no interface. This is because error exception handling can trigger notification or message to tell user if there is error happen. For example is when user submit wrong username or password. There should be a message trigger to notify user what is wrong. Other example is when user try to login into app but the phone does not have any internet connection so then app must trigger notification to tell user also. Figure 3.18 show that the user send the wrong password, even the username is right. Then Figure 3.19 show that there was a problem with data in database.
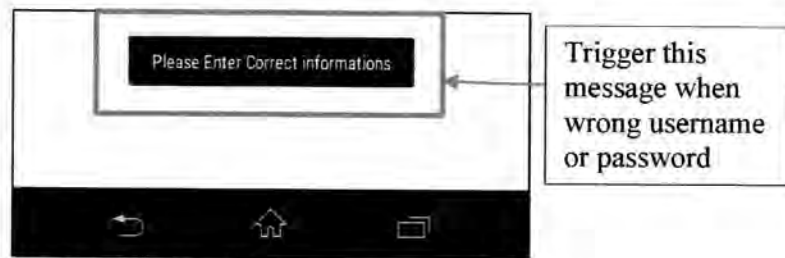
Figure 3.18 This app will popup message when error
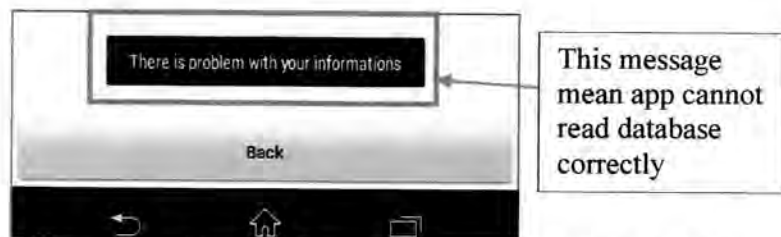
Figure 3.19 This is how error handling work when something is wrong to the app

3.4 Summary

In order to fulfil the requirement plan that request by students in survey analysis, project are designed with flexible development where design and construction run at the same time. Moreover the timescales of the project is fixed. The developer in development process must focus on the functionality of app which give the highest market value. Change in app requirement is often the cause of delays in application development. The RAD model follow scope and requirements target by limiting the project changes, limiting the cost of change and shortening the development cycle by running development and testing instantly (Hirschberg, n.d.).

CHAPTER 4
RESULT & DISCUSSION

4.1 Result

4.1.1 Client Website Portal

To make sure the system work well, the server must running with its own host. A hosting account have been create at cpanel.0hosting.org. The reason to choose this hosting plan because it is free and provided unlimited bandwidth with unlimited storage for cpanel. By using claroline system, this whole U-Learn portal able to be created in one time installation including its database. The declared website name is fastmlearning and the URL to this website is www.fastmlearning.tk. As it is free hosting then the only available Domain Name System (DNS) is '.tk'.
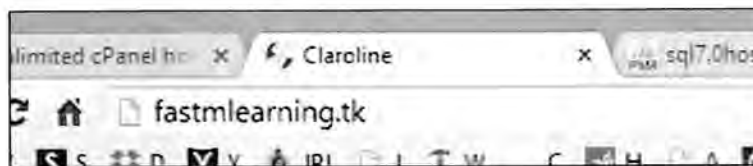
Figure 4.01 URL to get to portal

As show in Figure 4.01, the URL can directly put to browser (Google Chrome) and it will direct user to the main page. In main page, visitor will be a guest and need to login

to get to the content. Figure 4.02, show the login interface where visitor need to login to get to the home page.

Figure 4.02 Sign in page in portal

This Figure 4.03 show the content of system (as Administrator). Administrator has priviledge to access all pages in this portal.

Figure 4.03 Platform Admin

MY DESKTOP

My course list

Manage my courses

This is function for user to configure their course

📖 Create a course site   📚 Enrol on a new course
📚 Remove course enrolment   📖 All platform courses
● New items to another date

My course list

📄 BETT3353 - Telecommunication System
lecturer01

📄 BETT3403 - Digital Communication
lecturer01

List of Course user already enroll

📄 BETU3764 - Bachelor Degree Project 1
lecturer01

📄 BETU4774 - Bachelor Degree Project 2
lecturer01

Figure 4.04 Course section in portal

This course is create by admin or lecturer. Normal user like student only allowed to enroll and remove course enrolment.

	Subject	Sender	Date
	Welcome message | Show/Hide		
	My 5 last messages		
✉	Course created : Digital Communication	Safie Saleh	Tuesday November 25, 2014
✉	Course created : Telecommunication System	Safie Saleh	Tuesday November 25, 2014
✉	to all user	Safie Saleh	Tuesday November 25, 2014
✉	Course created : Bachelor Degree Project 2	Safie Saleh	Tuesday November 25, 2014
✉	Course created : Bachelor Degree Project 1	Safie Saleh	Tuesday November 25, 2014

View all my messages

Figure 4.05 Message section in portal
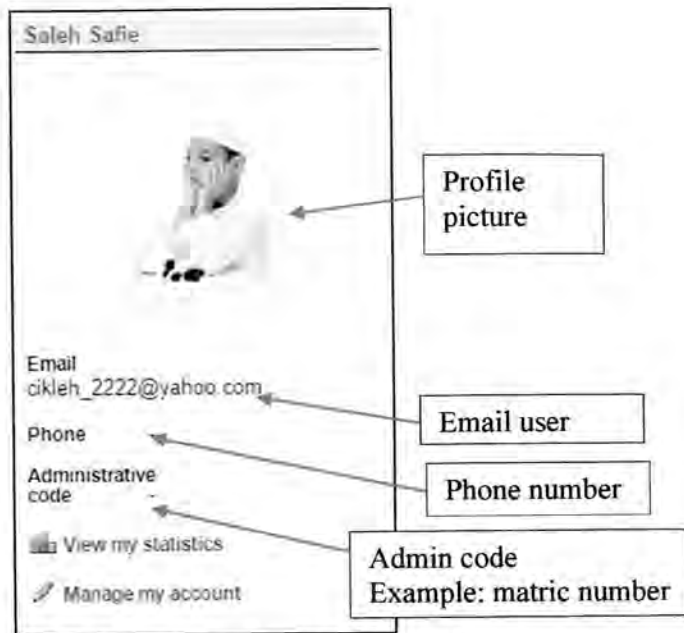
Figure 4.06 User account section in portal

This account is create by admin or University. Figure 4.06 is interface of the portal. User which is student or lecturer just use this platform because all the sign up process has been done by admin.

4.1.2 Client M-Learning App

This app is create using eclipse software. The first version of this app is create using jQuery Mobile but after some problem, the development was stop and continue with Eclipse software. Eclipse IDE is more stable software than other cross-platform software. This problem is state in analysis and discussion of this project. Also note that M-learning application is only for Android platform then the test result is from screenshot of the Android phone. Sony Xperia M2 dual D2302, Lenovo S890, and Alcatel OneTouch Glory 2s is used to test this application. Before user can use this app, they need to install this app using apk installer. Since this software is not from Google market or Google Play, user need to enable 3rd party software installation in Setting of Android OS. After that the installation con be done easily. Figure 4.1g show the app is being install into phone.

Figure 4.07 Installation of M-learning into phone

This is the app (client). This app require internet connection to operate
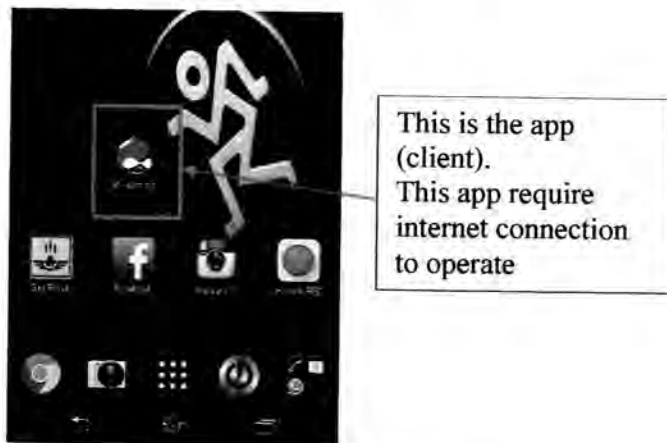
Figure 4.08 Icon for M-learning application

Figure 4.09 show the splash screen application and home screen. When the app is start, it must show splash screen and wait for 2 second before entering home. For home page, this page is use to display any announcement make from university or faculty. Faculty usually make announcement through portal and this portal can be access from anywhere including internet browser and no login require. At bottom of the page, there are sign in button which will make user change page to the login page. Further process is shown in Figure 4.09.
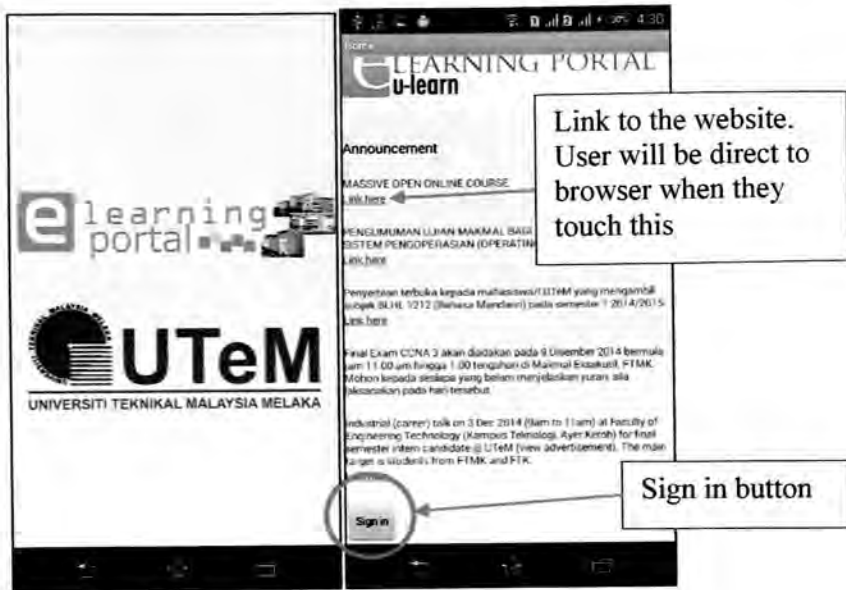
Figure 4.09 Front page of the application

In announcement section, there was link provided to go to specified page and sometime the link is used to attach file for student to download. By using this app, user can click the link provided in front page of the app and go to the specific page in browser. At bottom of the page, here was a button for sign in Figure4.10. If user click this button then they will be direct to the login page. Figure 4.10 show the login page for user to get authenticated from portal.
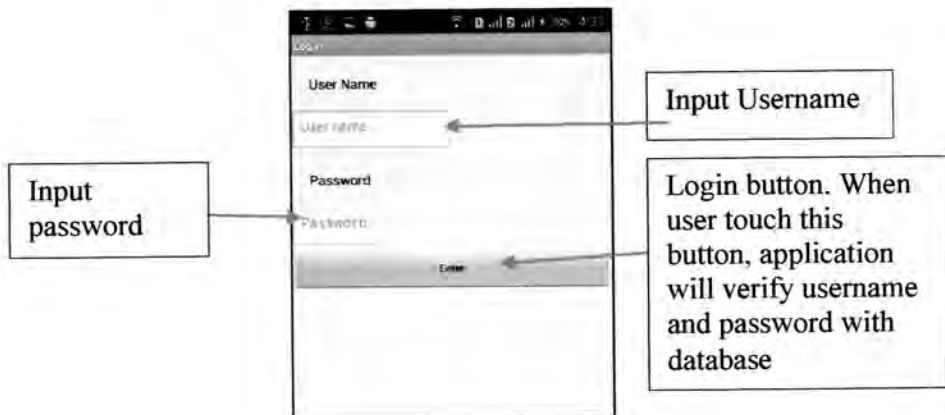
Figure 4.10 Login page
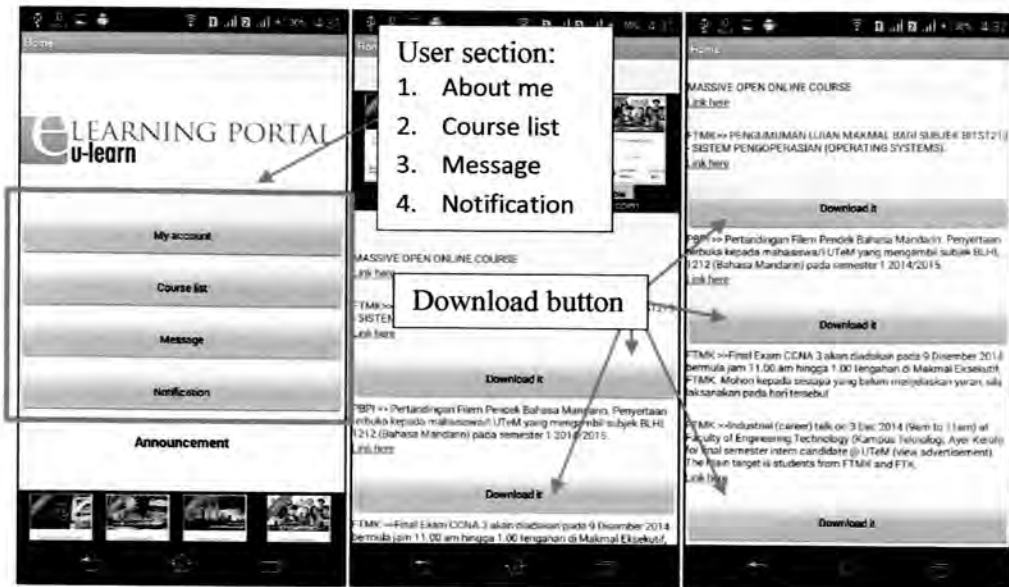
Figure 4.11 Home screen or menu

After login to the page, user can access to the main page where all the function of the apps is provide here (Figure 4.11). At main page user can 5 main buttons which is My account, Course list, Message and Notification. This button give user access to the portal content and get latest information of their account such notification and latest message. Also note that this page are in scroll view so user can scroll to see more.
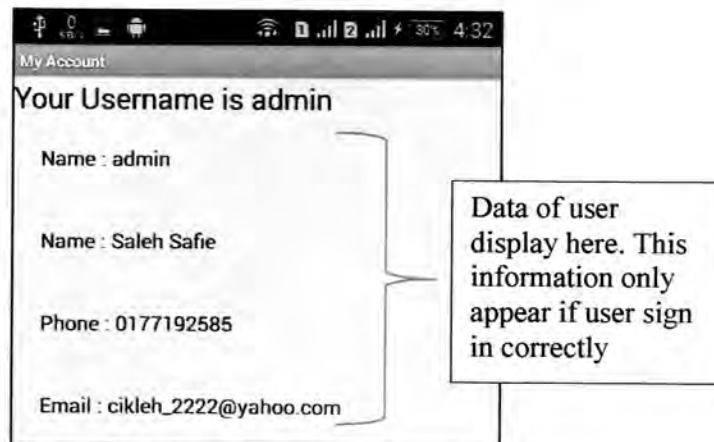
Figure 4.12 User account page

In Figure 4.12, this is account page where user can see their username, name, phone number and email. User only can see information about themselves and no other user.

Figure 4.13 Course list in for user is display here

In Figure 4.13 at this section, user can see their course list and also its code for the course. The same concept also happen at message section. User will see the latest 5 message in database. The reason this message only appear 5 message only is to remain app working at optimum performance. The more data fetch from server the less performance this app can provide. Also this fetching job will consume more data transfer if it does not controlled. Moreover, user usually don't have to see older message rather than new one. Figure 4.14 show the message section of the app, content of the app will not be display but only subject will be show to user.

Figure 4.14 Only 5 message will be display in application

This is happen like in Figure 4.15 if user touch the link in main page or home page. The app will call other application like browser (default browser selected by user) to go to specified link.

Figure 4.15 Massive Open Online Learning is open in browser

Other than that, M-learning app also can call other application such document reader and download service (Figure 4.16). Some of the link provided in this app is contain file or document which need to be download before user can open it.

Figure 4.16 External plugin for application such download manager and documents reader

4.2   Discussion

This application is about portal that user especially student use every day to check new assignment, new message and check their course notification. After making a mistake in creating this app, the outcome should be discuss at the end of project. The mistake is when choosing software IDE for creating app, the first version of the apps is created using jQuery Mobile. Compare to the eclipse, jQuery Mobile are more new cross platform for today because some library for android is not provide. The problem faced during app development is to connect app from client to server. There is no library yet to use to connect with database. The solution is to create a new custom API for client and server to communicate. This method is too dangerous to use where the custom API sometimes is not compatible with phone due to security issue and the way this API handle an error. Table 4.2 show finding of the comparison between jQuery Mobile and Eclipse IDE after this project end. This comparison is prepare as user perspective view after using both method in making M-learning app.

Table 4.2: Comparison between Eclipse and jQuery Mobile

	jQuery Mobile	Eclipse
Compiler	Adobe PhoneGap. Adobe PhoneGap is a web based compiler where developer need to upload a package of code into website and download the installer for android in .apk file. after that developer need to download that file into phone to test the app	Eclipse is java based IDE and able to compile Android code just with plugin of Android SDK library. It is compatible to all version of android because developer can select which android version to target. Also Eclipse able to compile through ADB where developer just connect USB into pc and run debugging process into phone.
Editor	Notepad ++ or Notepad windows	Eclipse Java Editor, this thing provide few features for developer such package explorer

		and outline.
Library	No specific library or user define library	Library from Android API where this thing provide available function in Android OS and latest feature in OS
Compilation time	Take time where developer need to upload the code and download the Android installer package from web to phone.	Just a few second and the app already install into phone without seeing the installation process inside phone.
Package stability	jQuery Mobile 1.4 (latest) is cross-platform application and not support for few function in Android app such hyperlink and notification manager.	Eclipse provide latest function and feature from latest Android version, sometimes even for unreleased android like 5.0 now in December 2014.

4.2.1 Finding

Through the development process there are few thing make this app become incomparable to the U-Learn website at ulearn.utem.edu.my. This is because the website is provide fully update system even to the admin privilege. Some function would be declare as far to achieve in app because of platform limitation. Then this conclude that the app need to continuously update to make it reliable with the web function.

Further than that, the current U-Learn system are using Claroline template where all the file is create using installation method. One of the feature in the template is mail service where all user can get email notification if there are new update available in their profile. Even after new file is uploaded into one course, user should see the notification through email. However this feature is disable in current U-Learn system at ulearn.utem.edu.my and any notification for each user must done manually. After this finding, the conclusion for current U-Learn is still lack of feature because the email service function provide in template is not used. The effect of this lack make U-Learn

portal system not fully utilized by student because student don't triggered by notification or any inform method unless there are told by lecturer.

Last but not least, the interface of U-Learn itself is not intuitive and not interesting. This make student become bored and lazy to open U-Learn portal. They rather open other social website such Facebook, Instagram, and etc. because those website has interesting content and latest information provided. Not only have that, the social website also given user notification even through email which this feature is absolutely not provide on current U-Learn system in 2014. In conclusion of this finding, the notification, message, and other feature is unavailable in 2014 version U-Learn system which make this site is incomparable to the other website and the effect of that is user not interested to open this portal.

CHAPTER 5
CONCLUSION & FUTURE WORK

5.1   Conclusion

The M-learning application is the extended version of current E-learning system. It is convert from the old version one to the Android mobile based application so user can utilized their phone as medium of study. User just have to access their account through app and get through all content of portal. The reason this portal need to convert to the mobile application is because by using mobile application, user can get access to the portal without opening url and they can have notification if user have new message in portal. To compare this application with other social application like Facebook, Twitter, Telegram and many more, this app is much left behind if compare with its interface and features.

The objective of this project is about to solve the problem of portal E-learning where student are unlikely interest to open portal. By using this app, student should be more motivated to open portal more often and access to the content in instant. Other than that, student be really appreciate to take advantage of study even when having a few minute break during class. This app also has provide new feature that don't provide in current portal which is notification direct to user. Other than that, this app also support all type of android device even in different resolution. However this app is limit to Android version 4.0 ICS until latest version because there is Download Manager function which only provide starting on ICS Android OS. After all hard work and effort, this project has

ended with successful output and achieved the objective state in earlier of this project development.

5.2 Future Work

The M-learning application has met the requirement for this project but there are more target to be achieved to improve this app in order to deliver good facility and material into study in university. Other than that, the app should has an updated version in future so student can have study material with new function and future provide by this app. Here are some idea for future expectation

(a) This app should store mobile number of lecturer so student can call their lecturer to ask anything.

(b) Chat to other user is one of the feature this app must have. At least, student can chat to lecturer and conversation can be safe into cloud.

(c) Besides chatting, student should able to manage their portal content through app without going to browser which mean it will be an independent app and no need other plugin.

(d) Last but not least M-learning application should have an option to auto-download content from portal. Then student can read it when they have free time.

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QUESTIONAIRE – ANALYSIS TO COLLECT FEATURE IN M-LEARNING APP

Mobile Learning for Education: Benefits and Comparisons

This project focuses on developing a mobile application that includes the major functionalities of the UTeM E-Learning website also known as U-Learn which are used by students, into a stand-alone mobile application (M-Learning). M-Learning is a mobile application that will help students to utilize the E-Learning website in an easy and portable platform. A survey need to be run to investigate which features is require to help student use M-learning application as their study material. Some useful idea from respondent will be choose as a part of M-learning application features. Thanks for supporting this project.

* Required

1. **College:**
   Utem or other university.
   Mark only one oval.

   ◯ Utem   *Skip to question 2.*

   ◯ Other: _____   *Skip to question 3.*

For UTeM student

Choose your own Faculty

2. **Faculty:**
   for student UTeM only
   Mark only one oval.

   ◯ FTMK
   ◯ FKP
   ◯ FKEKK
   ◯ FKE
   ◯ FTK
   ◯ FKM
   ◯ FPTT

cont..

APPENDICES A

3. **What is your frequency surfing e-learning website in a month?** *

   Provide by college, faculty or education agency

   Mark only one oval

   - less than 5
   - 5 to 10
   - 10 and above

4. **What usual thing you do when you surf e-learning website?** *

   tick at least one

   Check all that apply.

   - [ ] Download note and software
   - [ ] See announcement from lecturer
   - [ ] See news in e-learning site
   - [ ] Check notification
   - [ ] Submit assignment
   - [ ] Chat with lecturer
   - [ ] Other: _____

5. **Do you prefer to use e-learning in mobile?** *

   Mark only one oval.

   - Yes
   - No

6. **How many time do you used mobile device as part of study?** *

   reading, editing & etc

   Mark only one oval.

   - Everyday
   - Few times a week
   - Once a week
   - don't have smartphone or tablet

7. **Do you prefer to use mobile app rather than e-learning in desktop pc?** *

   Mark only one oval

   - Yes
   - No

APPENDICES A

8. **Which one do you like:** *

   Mark only one oval.

   - ⬭ Open browser in smartphone to surf e-learning

   - ⬭ Open application in smartphone to use M-learning.

9. **What additional features you want after changing e-learning to m-learning?** *

   list down

   _____

   _____

   _____

   _____

   _____

📄 Google Forms

REST API - SERVER CLIENT CONNECTIVITY

APPENDICES B

```php
<?php
    //about.php
     $response = array();
    require_once __DIR__ . '/db_connect.php';
     $prenom=$_POST['prenom'];
    $db = new DB_CONNECT();
     $result = mysql_query("Select * FROM cl_user");


    if (mysql_num_rows($result))
      {
      $row=mysql_fetch_array($result);
      $response["success"]=1;
      $response["about"]=$row['prenom'];
      $response["about1"]=$row['nom'];
      $response["about2"]=$row['phoneNumber'];
      $response["about3"]=$row['email'];

      echo json_encode($response);
      }
      else
      {
      $response["success"]=0;
      $response["about"]="Data not found";
      echo json_encode($response);
      }
    ?>
```

APPENDICES B

```php
<?php
    //course.php
      $response = array();
    require_once __DIR__ . '/db_connect.php';

    $db = new DB_CONNECT();
      $result = mysql_query("Select * FROM cl_cours where
cours_id='1'");
      $result1 = mysql_query("Select * FROM cl_cours where
cours_id='2'");
      $result2 = mysql_query("Select * FROM cl_cours where
cours_id='3'");
      $result3 = mysql_query("Select * FROM cl_cours where
cours_id='4'");



    if
(mysql_num_rows($result)+mysql_num_rows($result1)+mysql_num_row
s($result2)+mysql_num_rows($result3))
      {

    $row=mysql_fetch_array($result);
    $row1=mysql_fetch_array($result1);
    $row2=mysql_fetch_array($result2);
    $row3=mysql_fetch_array($result3);
    $response["success"]=1;
    $response["about"]=$row['code'];
    $response["about1"]=$row1['code'];
    $response["about2"]=$row2['code'];
    $response["about3"]=$row3['code'];
    $response["about4"]=$row['intitule'];
    $response["about5"]=$row1['intitule'];
    $response["about6"]=$row2['intitule'];
    $response["about7"]=$row3['intitule'];

    echo json_encode($response);
    }
    else
    {
    $response["success"]=0;
    $response["about"]="Data not found";
    echo json_encode($response);
    }
?>
```

APPENDICES B

```php
<?php
//db_config.php
define('DB_USER', "u459055404_saleh"); //u168643622_test
define('DB_PASSWORD', "kikukiku");
define('DB_DATABASE', "u459055404_saleh"); //u168643622_test
define('DB_SERVER', "mysql.0hosting.org");

?>
```

```php
<?php
//db_connect
class DB_CONNECT {

    function __construct()
      {
        $this->connect();
      }

    function __destruct()
      {
        $this->close();
      }

    function connect()
      {
        require_once __DIR__ . '/db_config.php';

        $con = mysql_connect(DB_SERVER, DB_USER, DB_PASSWORD)
or die(mysql_error());

        $db = mysql_select_db(DB_DATABASE) or
die(mysql_error()) or die(mysql_error());

        return $con;
      }

    function close()
      {
        mysql_close();
      }
}

?>
```

APPENDICES B

```php
<?php

$response = array();
if (isset($_POST['mobile_number']) && isset($_POST['password']))
)
  {
    $mobile_number = $_POST['mobile_number'];
    $password = $_POST['password'];
    require_once __DIR__ . '/db_connect.php';
    $db = new DB_CONNECT();

    $result = mysql_query("Select * from cl_user where
username='$mobile_number' and password='$password'");

    if (mysql_num_rows($result))
      {
        $response["success"] = 1;
        $response["message"] = "Login successfully.";
        echo json_encode($response);
    }
     else
     {
        $response["success"] = 0;
        $response["message"] = "Please Enter correct mobile
number and password.";
        echo json_encode($response);
    }

 }
 else
 {
    $response["success"] = 0;
    $response["message"] = "Required field(s) is missing";
    echo json_encode($response);
}
?>
```

```php
<?php
    $response = array();
    require_once __DIR__ . '/db_connect.php';
     //$prenom=$_POST['prenom'];
    $db = new DB_CONNECT();
     $count= mysql_query("SELECT MAX( message_id ) FROM
cl_im_message");
     $count2= mysql_query("SELECT (MAX(message_id)-1) AS
new_count   FROM cl_im_message");
     $count3= mysql_query("SELECT (MAX(message_id)-2) AS
new_count   FROM cl_im_message");
     $count4= mysql_query("SELECT (MAX(message_id)-3) AS
new_count   FROM cl_im_message");
     $count5= mysql_query("SELECT (MAX(message_id)-4) AS
new_count   FROM cl_im_message");


     $result = mysql_query("Select * FROM cl_im_message where
message_id='26'");
     $result1= mysql_query("Select * FROM cl_im_message where
message_id='25'");
     $result2= mysql_query("Select * FROM cl_im_message where
message_id='24'");
     $result3= mysql_query("Select * FROM cl_im_message where
message_id='23'");
     $result4= mysql_query("Select * FROM cl_im_message where
message_id='22'");



    if
(mysql_num_rows($result)+mysql_num_rows($result1)+mysql_num_row
s($result2)+mysql_num_rows($result3)+mysql_num_rows($result4))
     {

     $row=mysql_fetch_array($result);
     $row1=mysql_fetch_array($result1);
     $row2=mysql_fetch_array($result2);
     $row3=mysql_fetch_array($result3);
     $row4=mysql_fetch_array($result4);
     $response["success"]=1;
     $response["about"]=$row['subject'];
     $response["about1"]=$row1['subject'];
     $response["about2"]=$row2['subject'];
     $response["about3"]=$row3['subject'];
     $response["about4"]=$row4['subject'];
     $response["about5"]=$row['send_time'];
     $response["about6"]=$row1['send_time'];
     $response["about7"]=$row2['send_time'];
     $response["about8"]=$row3['send_time'];
     $response["about9"]=$row4['send_time'];
```

```php
      $response["about10"]=$row['sender'];
      $response["about11"]=$row1['sender'];
      $response["about12"]=$row2['sender'];
      $response["about13"]=$row3['sender'];
      $response["about14"]=$row4['sender'];


      echo json_encode($response);
      }
      else
      {
      $response["success"]=0;
      $response["about"]="Data not found";
      echo json_encode($response);
      }
?>
```

```php
<?php
//testpost.php
$response = array();


    $username = $_POST['fName'];
    //$lName = $_POST['lName'];
    require_once __DIR__ . '/db_connect.php';
    $db = new DB_CONNECT();

    $result = mysql_query("Select * from cl_user where
username='$username'");

    if (mysql_num_rows($result))
      {
      $row=mysql_fetch_array($result);
      $response["success"]=1;
      $response["prenom"]=$row['prenom'];
      echo json_encode($response);
      }
      else
      {
      $response["success"]=0;
      $response["prenom"]="Data not found";
      echo json_encode($response);
      }


?>
```

Java code – M-learning app

```java
package com.example.phonebook;
//fronthome.java (splash screen)
import android.app.Activity;
import android.content.Intent;
import android.os.Bundle;
import android.view.Window;
import android.view.WindowManager;

public class FrontHome extends Activity{

    /* (non-Javadoc)
     * @see android.app.Activity#onCreate(android.os.Bundle)
     */
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        // TODO Auto-generated method stub
        super.onCreate(savedInstanceState);

    this.getWindow().setFlags(WindowManager.LayoutParams.FLAG_
FULLSCREEN, WindowManager.LayoutParams.FLAG_FULLSCREEN);
        this.requestWindowFeature(Window.FEATURE_NO_TITLE);
        setContentView(R.layout.fronthome);

        Thread logoTimer = new Thread() {
         public void run(){
            try{
                int logoTimer = 0;
                while(logoTimer < 2000){
                    sleep(100);
                    logoTimer = logoTimer +100;
                };
                startActivity(new
Intent(getApplicationContext(),Home.class));
            }

            catch (InterruptedException e) {
                // TODO Auto-generated catch block
                e.printStackTrace();
            }

            finally{
                finish();
            }
          }
        };

        logoTimer.start();
    }
}
```

```java
package com.example.phonebook;
//Home.java
import android.app.Activity;
import android.app.DownloadManager;
import android.app.DownloadManager.Request;
import android.content.Context;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.text.Html;
import android.text.method.LinkMovementMethod;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class Home extends Activity{

    /* (non-Javadoc)
     * @see android.app.Activity#onCreate(android.os.Bundle)
     */
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        // TODO Auto-generated method stub
        super.onCreate(savedInstanceState);
        setContentView(R.layout.home);


        String servicestring = Context.DOWNLOAD_SERVICE;
        final DownloadManager downloadmanager =
(DownloadManager)getSystemService(servicestring);

        TextView link1 = (TextView)
findViewById(R.id.link1);
        String linkText1 = "<a
href='http://www.openlearning.com/malaysiamoocs'>Link
here</a>";
        link1.setText(Html.fromHtml(linkText1));

link1.setMovementMethod(LinkMovementMethod.getInstance());

        TextView link2 = (TextView)
findViewById(R.id.link2);
        String linkText2 = "<a
href='http://ulearn.utem.edu.my/claroline/backends/download.php
?url=L1Blbmd1bXVtYW5fVWppYW5fTWFrbWFsX1N1Ympla19TaXN0ZW1fUGVuZ2
9wZXJhc2lhbi5wZGY%3D&cidReset=true&cidReq=ANNFTMK'>Link
here</a>";
        link2.setText(Html.fromHtml(linkText2));

link2.setMovementMethod(LinkMovementMethod.getInstance());
```

```java
        TextView link3 = (TextView)
findViewById(R.id.link3);
        String linkText3 = "<a
href='http://ulearn.utem.edu.my/claroline/backends/download.php
?url=L1Bvc3Rlcl9GaWxlbV9NYW5kYXJpbi5wZGY%3D&cidReset=true&cidRe
q=ANN1235'>Link here</a>";
        link3.setText(Html.fromHtml(linkText3));

link3.setMovementMethod(LinkMovementMethod.getInstance());



        //TextView link4 = (TextView)
findViewById(R.id.link4);
        TextView link5 = (TextView)
findViewById(R.id.link5);
        String linkText5 = "<a
href='http://ulearn.utem.edu.my/claroline/backends/download.php
?url=L0luZHVzdHJpYWxfVGFsay0zZGVjLnBkZg%3D%3D&cidReset=true&cid
Req=ANNFTMK'>Link here</a>";
        link5.setText(Html.fromHtml(linkText5));

link5.setMovementMethod(LinkMovementMethod.getInstance());



        Button login=(Button)findViewById(R.id.callsignin);

        login.setOnClickListener(new View.OnClickListener()
        {
                @Override
                public void onClick(View view) {
                    Intent i = new
Intent(getApplicationContext(), MainActivity.class);
                    startActivity(i);

                }
        });

    }

}
```

```java
package com.example.phonebook;
//JSONParser.java
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.UnsupportedEncodingException;
import java.util.List;

import org.apache.http.HttpEntity;
import org.apache.http.HttpResponse;
import org.apache.http.NameValuePair;
import org.apache.http.client.ClientProtocolException;
import org.apache.http.client.entity.UrlEncodedFormEntity;
import org.apache.http.client.methods.HttpGet;
import org.apache.http.client.methods.HttpPost;
import org.apache.http.client.utils.URLEncodedUtils;
import org.apache.http.impl.client.DefaultHttpClient;
import org.json.JSONException;
import org.json.JSONObject;

import android.util.Log;

public class JSONParser {

    static InputStream is = null;
    static JSONObject jObj = null;
    static String json = "";

    public JSONParser()
    {

    }

    public JSONObject makeHttpRequest(String url, String
method,List<NameValuePair> params) {

        try {

            if(method == "POST")
             {
                DefaultHttpClient httpClient = new
DefaultHttpClient();
                HttpPost httpPost = new HttpPost(url);
                httpPost.setEntity(new
UrlEncodedFormEntity(params));

                HttpResponse httpResponse =
httpClient.execute(httpPost);
                HttpEntity httpEntity =
```

```
httpResponse.getEntity();
                    is = httpEntity.getContent();

            }
            else if(method == "GET")
            {
                    DefaultHttpClient httpClient = new
DefaultHttpClient();
                    String paramString =
URLEncodedUtils.format(params, "utf-8");
                    url += "?" + paramString;
                    HttpGet httpGet = new HttpGet(url);

                    HttpResponse httpResponse =
httpClient.execute(httpGet);
                    HttpEntity httpEntity =
httpResponse.getEntity();
                    is = httpEntity.getContent();
            }


        } catch (UnsupportedEncodingException e) {
            e.printStackTrace();
        } catch (ClientProtocolException e) {
            e.printStackTrace();
        } catch (IOException e) {
            e.printStackTrace();
        }

        try {
            BufferedReader reader = new BufferedReader(new
InputStreamReader(is, "iso-8859-1"), 8);
            StringBuilder sb = new StringBuilder();
            String line = null;
            while ((line = reader.readLine()) != null)
            {
             sb.append(line + "\n");
            }
            is.close();
            json = sb.toString();
        }
        catch (Exception e)  {
            Log.e("Buffer Error", "Error converting result
" + e.toString());
        }
        try {
            jObj = new JSONObject(json);
        } catch (JSONException e) {
            Log.e("JSON Parser", "Error parsing data " +
e.toString());
```

```
        }
        //return json string
        return jObj;
    }
}
```

```java
package com.example.phonebook;
//MainActivity.java
import java.util.ArrayList;
import java.util.List;
import org.apache.http.NameValuePair;
import org.apache.http.message.BasicNameValuePair;
import org.json.JSONException;
import org.json.JSONObject;
import android.net.ConnectivityManager;
import android.net.NetworkInfo;
import android.os.AsyncTask;
import android.os.Bundle;
import android.os.StrictMode;
import android.app.Activity;
import android.app.ProgressDialog;
import android.content.Context;
import android.content.Intent;
import android.util.Log;
import android.view.Menu;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends Activity {
      Button login,signin;
      private EditText mobile_number,password;
      private ProgressDialog pDialog;
      int flag=0;
      JSONParser jsonParser = new JSONParser();
      private static String url =
"http://fastmlearning.tk/mobile_access/login.php";
      private static final String TAG_SUCCESS = "success";

      @Override
      protected void onCreate(Bundle savedInstanceState) {
            StrictMode.setThreadPolicy(new
StrictMode.ThreadPolicy.Builder()

      .detectDiskReads().detectDiskWrites().detectNetwork()
            .penaltyLog().build());
            super.onCreate(savedInstanceState);
            setContentView(R.layout.activity_main);
       /*TAK PERLU
      //Go To Signin.java
            signin=(Button)findViewById(R.id.signin);
        signin.setOnClickListener(new View.OnClickListener()
        {
                @Override
                public void onClick(View view) {
```

```java
                    Intent i = new
Intent(getApplicationContext(), Signin.class);
                    startActivity(i);


            }
        }); */
    // Close Signin.java

    //Get all data and log in
    login=(Button)findViewById(R.id.login);
    mobile_number=(EditText)findViewById(R.id.mobile_number);
    password=(EditText)findViewById(R.id.password);

        login.setOnClickListener(new View.OnClickListener()
        {
                @Override
                public void onClick(View view) {

            //Check all fields
                    if(mobile_number.length()<1)
                    {

    Toast.makeText(MainActivity.this,"Please Enter correct
ID", Toast.LENGTH_LONG).show();
                        return;
                    }
                     if(password.length()<4)
                    {

    Toast.makeText(MainActivity.this,"Please Enter correct
password", Toast.LENGTH_LONG).show();
                        return;
                    }
            //check connectivity
                    if(!isOnline(MainActivity.this))
                    {
                        Toast.makeText(MainActivity.this,"No
network connection", Toast.LENGTH_LONG).show();
                        return;
                    }

            //from login.java
                        new loginAccess().execute();
                }

        //code to check online details
        private boolean isOnline(Context mContext) {
        ConnectivityManager cm = (ConnectivityManager)
mContext.getSystemService(Context.CONNECTIVITY_SERVICE);
```

```
            NetworkInfo netInfo = cm.getActiveNetworkInfo();
            if (netInfo != null &&
netInfo.isConnectedOrConnecting())
               {
                  return true;
               }
               return false;
            }
      //Close code that check online details
        });
         //Close log in
    }


class loginAccess extends AsyncTask<String, String, String> {

     protected void onPreExecute() {
            super.onPreExecute();
            pDialog = new ProgressDialog(MainActivity.this);
            pDialog.setMessage("Login...");
            pDialog.setIndeterminate(false);
            pDialog.setCancelable(true);
            pDialog.show();
     }


     @Override
     protected String doInBackground(String... arg0) {
            List<NameValuePair> params = new
ArrayList<NameValuePair>();
            String number=mobile_number.getText().toString();
            String pwd=password.getText().toString();
            params.add(new BasicNameValuePair("mobile_number",
number));
            params.add(new BasicNameValuePair("password", pwd));
            JSONObject json =
jsonParser.makeHttpRequest(url,"POST", params);
            Log.d("Create Response", json.toString());

            try {
                 int success = json.getInt(TAG_SUCCESS);
      //int success = json.getInt(TAG_SUCCESS);
                 if (success == 1)
      //if (success == 1)
                    {
                     flag=0;
                     Intent i = new
Intent(getApplicationContext(),Welcome.class);
                     i.putExtra("mobile_number",number);
```

```java
                    i.putExtra("password",pwd);
                    startActivity(i);
                    finish();
                }
                else
                {
                    // failed to login
                    flag=1;
                }
        } catch (JSONException e) {
            e.printStackTrace();
        }
        return null;
    }
    protected void onPostExecute(String file_url) {
        pDialog.dismiss();
        if(flag==1)
            Toast.makeText(MainActivity.this,"Please Enter
Correct informations", Toast.LENGTH_LONG).show();

    }

  }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action
bar if it is present.
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }

}
```

```java
package com.example.phonebook;
//Notification.java
import android.app.Activity;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Context;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class Notification extends Activity{


    @Override
    protected void onCreate(Bundle savedInstanceState) {
        // TODO Auto-generated method stub
        super.onCreate(savedInstanceState);
        setContentView(R.layout.notification);

        // prepare intent which is triggered if the
        // notification is selected

        Intent intent = new Intent(this,
Notification.class);
        PendingIntent pIntent =
PendingIntent.getActivity(this, 0, intent, 0);

        // build notification
        // the addAction re-use the same intent to keep the
example short
        Notification n  = new Notification.Builder(this)
                .setContentTitle("New message from ulearn" +
"test@gmail.com")
                .setContentText("Subject")
                .setSmallIcon(R.drawable.icon)
                .setContentIntent(pIntent)
                .setAutoCancel(true);


        NotificationManager notificationManager =
            (NotificationManager)
getSystemService(NOTIFICATION_SERVICE);

        notificationManager.notify(0, n);


        Button back = (Button) findViewById(R.id.back);
        back.setOnClickListener(new View.OnClickListener()
```

```
        {

                @Override
                public void onClick(View v) {
                        // TODO Auto-generated method stub
                        Intent i = new
Intent(getApplicationContext(),Welcome.class);
                        startActivity(i);
                }

        });

    }


}
```

```java
package com.example.phonebook;
//Welcome.java
import java.util.ArrayList;
import java.util.List;

import org.apache.http.NameValuePair;
import org.apache.http.message.BasicNameValuePair;
import org.json.JSONException;
import org.json.JSONObject;

import android.net.ConnectivityManager;
import android.net.NetworkInfo;
import android.net.Uri;
import android.os.AsyncTask;
import android.os.Bundle;
import android.os.StrictMode;
import android.app.Activity;
import android.app.DownloadManager;
import android.app.ProgressDialog;
import android.app.DownloadManager.Request;
import android.content.Context;
import android.content.Intent;
import android.content.SharedPreferences;
import android.content.SharedPreferences.Editor;
import android.text.Html;
import android.text.method.LinkMovementMethod;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

public class Welcome extends Activity {
    private ProgressDialog pDialog;
    String fName,lName;
    int flag=0;
    JSONParser jsonParser = new JSONParser();
    private static String url =
"http://fastmlearning.tk/mobile_access/about.php";
    private static final String about = "about";
    private static final String about1 = "about1";
    private static final String about2 = "about2";
    private static final String about3 = "about3";
    private static final String about4 = "about4";
    private static final String about5 = "about5";
    private static final String about6 = "about6";
    private static final String about7 = "about7";
    private static final String about8 = "about8";
    private static final String about9 = "about9";
```

```java
    private static final String about10 = "about10";
    private static final String about11 = "about11";
    private static final String about12 = "about12";
    private static final String about13 = "about13";
    private static final String about14 = "about14";

    private static final String TAG_SUCCESS="success";

    SharedPreferences sharedpreferences;
    public static final String MyPREFERENCES = "MyPrefs" ;
    public static final String name="username";
    public static final String pass="password";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
            StrictMode.setThreadPolicy(new
StrictMode.ThreadPolicy.Builder()

        .detectDiskReads().detectDiskWrites().detectNetwork()
            .penaltyLog().build());
            super.onCreate(savedInstanceState);
            setContentView(R.layout.welcome);

            Button down1 = (Button)
findViewById(R.id.download11);
            Button down2 = (Button)
findViewById(R.id.download22);
            Button down3 = (Button)
findViewById(R.id.download33);

            String servicestring = Context.DOWNLOAD_SERVICE;
            final DownloadManager downloadmanager =
(DownloadManager)getSystemService(servicestring);

            TextView link1 = (TextView)
findViewById(R.id.link11);
            String linkText1 = "<a
href='http://www.openlearning.com/malaysiamoocs'>Link
here</a>";
            link1.setText(Html.fromHtml(linkText1));

link1.setMovementMethod(LinkMovementMethod.getInstance());

            TextView link2 = (TextView)
findViewById(R.id.link22);
            String linkText2 = "<a
href='http://ulearn.utem.edu.my/claroline/backends/download.php
?url=L1Blbmd1bXVtYW5fVWppYW5fTWFrbWFsX1N1Ympla19TaXN0ZW1fUGVuZ2
9wZXJhc21hbi5wZGY%3D&cidReset=true&cidReq=ANNFTMK'>Link
here</a>";
```

```
        link2.setText(Html.fromHtml(linkText2));

link2.setMovementMethod(LinkMovementMethod.getInstance());

        down1.setOnClickListener(new View.OnClickListener()
        {

            @Override
            public void onClick(View v) {
                // TODO Auto-generated method stub
                Uri uri =
Uri.parse("http://ulearn.utem.edu.my/claroline/backends/downloa
d.php?url=L1Blbmd1bXVtYW5fVWppYW5fTWFrbWFsX1N1Ympla19TaXN0ZW1fU
GVuZ29wZXJhc2lhbi5wZGY%3D&cidReset=true&cidReq=ANNFTMK");
                DownloadManager.Request request = new
Request(uri);

                long reference =
downloadmanager.enqueue(request);
            }

        });

        TextView link3 = (TextView)
findViewById(R.id.link33);
        String linkText3 = "<a
href='http://ulearn.utem.edu.my/claroline/backends/download.php
?url=L1Bvc3Rlcl9GaWxlbV9NYW5kYXJpbi5wZGY%3D&cidReset=true&cidRe
q=ANN1235'>Link here</a>";
        link3.setText(Html.fromHtml(linkText3));

link3.setMovementMethod(LinkMovementMethod.getInstance());

        down2.setOnClickListener(new View.OnClickListener()
        {

            @Override
            public void onClick(View v) {
                // TODO Auto-generated method stub
                Uri uri =
Uri.parse("http://ulearn.utem.edu.my/claroline/backends/downloa
d.php?url=L1Bvc3Rlcl9GaWxlbV9NYW5kYXJpbi5wZGY%3D&cidReset=true&
cidReq=ANN1235");
                DownloadManager.Request request = new
Request(uri);

                long reference =
downloadmanager.enqueue(request);
            }

        });
```

```java
        //TextView link4 = (TextView)
findViewById(R.id.link4);
        TextView link5 = (TextView)
findViewById(R.id.link55);
        String linkText5 = "<a
href='http://ulearn.utem.edu.my/claroline/backends/download.php
?url=L0luZHVzdHJpYWxfVGFsay0zZGVjLnBkZg%3D%3D&cidReset=true&cid
Req=ANNFTMK'>Link here</a>";
        link5.setText(Html.fromHtml(linkText5));

link5.setMovementMethod(LinkMovementMethod.getInstance());

        down3.setOnClickListener(new View.OnClickListener()
        {

                @Override
                public void onClick(View v) {
                        // TODO Auto-generated method stub
                        Uri uri =
Uri.parse("http://ulearn.utem.edu.my/claroline/backends/downloa
d.php?url=L0luZHVzdHJpYWxfVGFsay0zZGVjLnBkZg%3D%3D&cidReset=tru
e&cidReq=ANNFTMK");
                        DownloadManager.Request request = new
Request(uri);
                        long reference =
downloadmanager.enqueue(request);
                }

        });
        Intent intent = getIntent();
        //TextView show = (TextView)
findViewById(R.id.showintent);
        fName = intent.getStringExtra("mobile_number");
        lName = intent.getStringExtra("password");

        //show.setText("Your Username is "+fName+ " "+ lName);
    }



    @Override
    protected void onResume() {
        // TODO Auto-generated method stub

    sharedpreferences=getSharedPreferences(MyPREFERENCES,
Context.MODE_PRIVATE);

        if (sharedpreferences.contains(fName))
        {
        if(sharedpreferences.contains(lName))
```

```java
                    Intent i = new Intent(this, About.class);
                    startActivity(i);
            }
            }
            super.onResume();
    }

    public void login(View view){
            Editor editor = sharedpreferences.edit();
            //String u = fName.getText().toString();
            //String p = password.getText().toString();
            editor.putString(name, fName);
            editor.putString(pass, lName );
            editor.commit();
            Intent i = new Intent(this,About.class);
            startActivity(i);
        }

    public void action(View v)
    {
            if(v.getId()==R.id.w_bt1)
            {
                url =
"http://fastmlearning.tk/mobile_access/about.php";
                new loginAccess().execute();


            }else if(v.getId()==R.id.w_bt2)
            {
                url =
"http://fastmlearning.tk/mobile_access/course.php";
                new loginAccess1().execute();
                //Intent i = new
Intent(getApplicationContext(),Course.class);
                //i.putExtra("fName",fName);
                //i.putExtra("lName",lName);
                //startActivity(i);
            }else if(v.getId()==R.id.w_bt3)
            {
                url =
"http://fastmlearning.tk/mobile_access/message.php";
                new loginAccess2().execute();
                //Intent i = new
Intent(getApplicationContext(),Message.class);
                //i.putExtra("fName",fName);
                //i.putExtra("lName",lName);
                //startActivity(i);
            }else if(v.getId()==R.id.w_bt4)
            {
                new loginAccess().execute();
```

```
                    Intent i = new
Intent(getApplicationContext(),Notification.class);
                    i.putExtra("fName",fName);
                    i.putExtra("lName",lName);
                    startActivity(i);
            }else
                Toast.makeText(this, "This is demo for M-
learning", Toast.LENGTH_LONG).show();
    }

//utk page MY ACCOUNT
class loginAccess extends AsyncTask<String, String, String> {

    protected void onPreExecute() {
            super.onPreExecute();
            pDialog = new ProgressDialog(Welcome.this);
            pDialog.setMessage("Wait...");
            pDialog.setIndeterminate(false);
            pDialog.setCancelable(true);
            pDialog.show();
    }
    @Override
    protected String doInBackground(String... arg0) {
            List<NameValuePair> params = new
ArrayList<NameValuePair>();
            params.add(new BasicNameValuePair(" "," "));
            JSONObject json =
jsonParser.makeHttpRequest(url,"POST", params);
            Log.d("Create Response", json.toString());

            try {
                int success = json.getInt(TAG_SUCCESS);
                if (success == 1)
                 {
                  flag=0;
                  String abt=json.getString(about);
                  String abt1=json.getString(about1);
                  String abt2=json.getString(about2);
                  String abt3=json.getString(about3);
                  //Toast.makeText(Welcome.this,abt,
Toast.LENGTH_LONG).show();
                  Intent i = new
Intent(getApplicationContext(),About.class);
                  i.putExtra("about", abt);
                  i.putExtra("about1", abt1);
                  i.putExtra("about2", abt2);
                  i.putExtra("about3", abt3);
                  startActivity(i);
                 }
                 else
```

```
                else
                {
                    flag=1;
                }
        } catch (JSONException e) {
            e.printStackTrace();
        }
        return null;
    }

    protected void onPostExecute(String file_url) {
        pDialog.dismiss();
        if(flag==1)
            Toast.makeText(Welcome.this,"Data Not
Found", Toast.LENGTH_LONG).show();


    }


    }


//UTK PAGE COURSE LIST
class loginAccess1 extends AsyncTask<String, String, String> {

    protected void onPreExecute() {
        super.onPreExecute();
        pDialog = new ProgressDialog(Welcome.this);
        pDialog.setMessage("Wait...");
        pDialog.setIndeterminate(false);
        pDialog.setCancelable(true);
        pDialog.show();
    }
    @Override
    protected String doInBackground(String... arg0) {
        List<NameValuePair> params = new
ArrayList<NameValuePair>();
        params.add(new BasicNameValuePair(" "," "));
        JSONObject json =
jsonParser.makeHttpRequest(url,"POST", params);
        Log.d("Create Response", json.toString());

        try {
            int success = json.getInt(TAG_SUCCESS);
            if (success == 1)
            {
              flag=0;
              String abt=json.getString(about);
              String abt1=json.getString(about1);
              String abt2=json.getString(about2);
              String abt3=json.getString(about3);
              String abt4=json.getString(about4);
```

```
                    String abt5=json.getString(about5);
                    String abt6=json.getString(about6);
                    String abt7=json.getString(about7);
                    //Toast.makeText(Welcome.this,abt,
Toast.LENGTH_LONG).show();
                    Intent i = new
Intent(getApplicationContext(),Course.class);
                    i.putExtra("about", abt);
                    i.putExtra("about1", abt1);
                    i.putExtra("about2", abt2);
                    i.putExtra("about3", abt3);
                    i.putExtra("about4", abt4);
                    i.putExtra("about5", abt5);
                    i.putExtra("about6", abt6);
                    i.putExtra("about7", abt7);
                    startActivity(i);
                    }
                    else
                    {
                        flag=1;
                    }
            } catch (JSONException e) {
                    e.printStackTrace();
            }
            return null;
        }

        protected void onPostExecute(String file_url) {
                pDialog.dismiss();
                if(flag==1)
                        Toast.makeText(Welcome.this,"Data Not
Found", Toast.LENGTH_LONG).show();


        }


        }


//UTK PAGE MESSAGE LIST
class loginAccess2 extends AsyncTask<String, String, String> {

        protected void onPreExecute() {
                super.onPreExecute();
                pDialog = new ProgressDialog(Welcome.this);
                pDialog.setMessage("Wait...");
                pDialog.setIndeterminate(false);
                pDialog.setCancelable(true);
                pDialog.show();
        }
        @Override
        protected String doInBackground(String... arg0) {
```

```
            List<NameValuePair> params = new
ArrayList<NameValuePair>();
            params.add(new BasicNameValuePair(" "," "));
            JSONObject json =
jsonParser.makeHttpRequest(url,"POST", params);
            Log.d("Create Response", json.toString());

            try {
                int success = json.getInt(TAG_SUCCESS);
                if (success == 1)
                 {
                  flag=0;
                  String abt=json.getString(about);
                  String abt1=json.getString(about1);
                  String abt2=json.getString(about2);
                  String abt3=json.getString(about3);
                  String abt4=json.getString(about4);
                  String abt5=json.getString(about5);
                  String abt6=json.getString(about6);
                  String abt7=json.getString(about7);
                  String abt8=json.getString(about8);
                  String abt9=json.getString(about9);
                  String abt10=json.getString(about10);
                  String abt11=json.getString(about11);
                  String abt12=json.getString(about12);
                  String abt13=json.getString(about13);
                  String abt14=json.getString(about14);
                  //Toast.makeText(Welcome.this,abt,
Toast.LENGTH_LONG).show();
                  Intent i = new
Intent(getApplicationContext(),Message.class);
                  i.putExtra("about", abt);
                  i.putExtra("about1", abt1);
                  i.putExtra("about2", abt2);
                  i.putExtra("about3", abt3);
                  i.putExtra("about4", abt4);
                  i.putExtra("about5", abt5);
                  i.putExtra("about6", abt6);
                  i.putExtra("about7", abt7);
                  i.putExtra("about8", abt8);
                  i.putExtra("about9", abt9);
                  i.putExtra("about10", abt10);
                  i.putExtra("about11", abt11);
                  i.putExtra("about12", abt12);
                  i.putExtra("about13", abt13);
                  i.putExtra("about14", abt14);
                  startActivity(i);
                 }
                 else
                 {
```

```java
                    flag=1;
                }
        } catch (JSONException e) {
            e.printStackTrace();
        }
        return null;
    }

        protected void onPostExecute(String file_url) {
            pDialog.dismiss();
            if(flag==1)
                    Toast.makeText(Welcome.this,"Data Not
Found", Toast.LENGTH_LONG).show();


        }

    }

    @Override
    public void onBackPressed() {
    }

}
```

```
package com.example.phonebook;
//Notification.java
import java.util.ArrayList;
import java.util.List;

import org.apache.http.NameValuePair;
import org.apache.http.message.BasicNameValuePair;
import org.json.JSONException;
import org.json.JSONObject;

import com.example.phonebook.Welcome.loginAccess;

import android.app.Activity;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.app.ProgressDialog;
import android.content.Context;
import android.content.Intent;
import android.os.AsyncTask;
import android.os.Bundle;
import android.support.v4.app.NotificationCompat;
import android.support.v4.app.NotificationCompat.Builder;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;

public class Notification extends Activity{

        private ProgressDialog pDialog;
        int flag=0;
        String abt="title",abt1="contain";

        JSONParser jsonParser = new JSONParser();
        private static final String about = "about";
        private static final String about1 = "about1";
        //private static final String about2 = "about2";
        private static final String TAG_SUCCESS="success";


        @Override
        protected void onCreate(Bundle savedInstanceState) {
            // TODO Auto-generated method stub
            super.onCreate(savedInstanceState);
            setContentView(R.layout.notification);
```

```java
            Intent i=getIntent();
            abt=i.getStringExtra("about");
            abt1=i.getStringExtra("about1");
            sendBasicNotification();



            Button back = (Button) findViewById(R.id.back);
            back.setOnClickListener(new View.OnClickListener()
            {

                @Override
                public void onClick(View v) {
                        // TODO Auto-generated method stub
                        Intent i = new
Intent(getApplicationContext(),Welcome.class);
                        startActivity(i);
                }

            });

        }
        private void sendBasicNotification(){
        //Intent intent = new Intent(this,Notification.class);
        //PendingIntent pi = PendingIntent.getActivity(this, 1,
intent, 0);
        Builder builder = new NotificationCompat.Builder(this);
        builder.setAutoCancel(true);
        builder.setContentTitle(abt);
        builder.setContentText(abt1);
        builder.setSmallIcon(R.drawable.alert);
        android.app.Notification notification = builder.build();

        NotificationManager manager =
(NotificationManager)this.getSystemService(NOTIFICATION_SERVICE
);
        manager.notify(8,notification);

        }


}
```

XML CODE – M-LEARNING APP

APPENDICES B

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical">

    <TextView
        android:id="@+id/a_tv"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:text="My account"

android:textAppearance="?android:attr/textAppearanceLarge"
        android:textSize="25sp" />

    <TextView
        android:id="@+id/username"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:padding="20dp"
        android:text=" "

android:textAppearance="?android:attr/textAppearanceMedium" />

    <TextView
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:padding="20dp"
        android:text="Name :"

android:textAppearance="?android:attr/textAppearanceMedium" />

    <TextView
        android:id="@+id/id"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:padding="20dp"
        android:text="Phone :"

android:textAppearance="?android:attr/textAppearanceMedium" />
```

```xml
    <TextView
        android:id="@+id/email"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:padding="20dp"
        android:text="Email :"

android:textAppearance="?android:attr/textAppearanceMedium" />
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="bottom">
    <Button
        android:id="@+id/back"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Back" />
</LinearLayout>
</LinearLayout>
```

APPENDICES B

```xml
<!-- activity_main.xml -->
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >
      <TextView
         android:id="@+id/textView1"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:padding="20dp"
         android:text="User Name"

android:textAppearance="?android:attr/textAppearanceMedium" />

      <EditText
         android:id="@+id/mobile_number"
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:ems="10"
         android:hint="User name"
         android:inputType="text"
         android:maxLength="10"
         android:paddingBottom="20dp" />

      <TextView
         android:id="@+id/textView2"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:padding="20dp"
         android:text="Password"

android:textAppearance="?android:attr/textAppearanceMedium" />

      <EditText
         android:id="@+id/password"
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:paddingBottom="20dp"
         android:hint="Password"
         android:inputType="textPassword" />

      <Button
         android:id="@+id/login"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:layout_alignParentLeft="true"
         android:text="Enter" />
</LinearLayout>
```

```xml
<!-- course.xml -->
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >

    <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textStyle="bold"
            android:text="MY Course list"
            android:padding="20dp"
            android:layout_gravity="center"

android:textAppearance="?android:attr/textAppearanceMedium" />

    <TableLayout
        android:id = "@+id/RHE"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
            android:gravity="center"
        android:padding="5dp">
<!-- 1st row -->


    <TableRow android:layout_width="match_parent"

        android:layout_height="wrap_content">
        <TextView
            android:layout_weight="30"
            android:text="Code"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:textStyle="bold"
            />
        <TextView
            android:layout_weight="70"
            android:text="Course Name"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:textStyle="bold"
            />

    </TableRow>
```

```
<!-- 2nd row -->
    <TableRow android:layout_height="wrap_content">
        <TextView
            android:layout_weight="30"
            android:id="@+id/code1"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="70"
            android:id="@+id/coursename1"
            android:text=" "
            android:layout_height="wrap_content"
            />

    </TableRow>
<!-- 3rd row -->
    <TableRow android:layout_height="wrap_content">
        <TextView
            android:layout_weight="30"
            android:id="@+id/code2"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="70"
            android:id="@+id/coursename2"
            android:text=" "
            android:layout_height="wrap_content"
            />

    </TableRow>
<!-- 4th row -->
    <TableRow android:layout_height="wrap_content">
        <TextView
            android:layout_weight="30"
            android:id="@+id/code3"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="70"
            android:id="@+id/coursename3"
            android:text=" "
            android:layout_height="wrap_content"
            />

    </TableRow>
```

```
<!-- 5th row -->
    <TableRow android:layout_height="wrap_content">
        <TextView
            android:layout_weight="30"
            android:id="@+id/code4"
            android:text="BETU4774"
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="70"
            android:id="@+id/coursename4"
            android:text="Bachelor Degree Project 2"
            android:layout_height="wrap_content"
            />

    </TableRow>
</TableLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="bottom">
    <Button
        android:id="@+id/back"
        style="?android:attr/buttonStyleSmall"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Back" />
    </LinearLayout>
</LinearLayout>
```

```xml
<!-- fronthome.xml -->
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center">

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"

        android:orientation="vertical" >

    <ImageView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:clickable="false"
        android:scaleType="centerInside"
        android:src="@drawable/banner2" >
</ImageView>

    <ImageView

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
            android:src="@drawable/logo"
        android:layout_centerInParent="true"
        android:clickable="false"
        android:scaleType="fitXY"></ImageView>
    </LinearLayout>

</LinearLayout>
```

APPENDICES B

```xml
<!-- home.xml -->
<?xml version="1.0" encoding="utf-8"?>
<ScrollView
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >
    <TableLayout
        android:layout_width="fill_parent"
        android:layout_height="fill_parent"
        android:stretchColumns="1"
        >

    <ImageView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/banner" />

    <TextView

        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Announcement"
        android:paddingBottom="20dp"

android:textAppearance="?android:attr/textAppearanceMedium" />
<!-- ini anouncement 1 -->
    <TextView
        android:id="@+id/announce1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=" " />
    <TextView
        android:id="@+id/link1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text="Link here" />
<!-- ini anouncement 2 -->
    <TextView
        android:id="@+id/announce2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=" />
    <TextView
        android:id="@+id/link2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text="Link here" />
```

```xml
<!-- ini anouncement 3 -->
    <TextView
        android:id="@+id/announce3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=" />
    <TextView
        android:id="@+id/link3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text="Link here" />

<!-- ini anouncement 4 -->
    <TextView
        android:id="@+id/announce4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text=" />

<!-- ini anouncement 5 -->
    <TextView
        android:id="@+id/announce5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=" />
    <TextView
        android:id="@+id/link5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text="Link here" />

    <LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <Button
        android:id="@+id/callsignin"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:text="Sign in" />
    </LinearLayout>
    </TableLayout>

</ScrollView>
```

APPENDICES B

```xml
<!-- message.xml -->
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >
    <LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical" >
    <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center"
            android:textStyle="bold"
            android:text="My 5 last messages"
            android:padding="20dp"

android:textAppearance="?android:attr/textAppearanceMedium" />
    </LinearLayout>
<ScrollView
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    >
    <TableLayout
        android:id = "@+id/RHE"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
         android:gravity="center"
        android:padding="5dp">
<!-- 1st row -->
    <TableRow android:layout_width="match_parent"

        android:layout_height="wrap_content">
        <TextView
            android:layout_weight="70"
            android:text="Subject"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:textStyle="bold"
            />
        <TextView
            android:layout_weight="10"
            android:text="Date"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:textStyle="bold"
            />
```

```xml
        <TextView
            android:layout_weight="10"
            android:text="Sender"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:textStyle="bold"
            />

    </TableRow>
<!-- 2nd row -->
    <TableRow android:layout_height="wrap_content">
        <TextView
            android:layout_weight="70"
            android:id="@+id/subject1"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="10"
            android:id="@+id/date1"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="10"
            android:text=" "
            android:id="@+id/sender1"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            />

    </TableRow>
<!-- 3rd row -->
    <TableRow android:layout_height="wrap_content">
        <TextView
            android:layout_weight="70"
            android:id="@+id/subject2"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="10"
            android:id="@+id/date2"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="10"
            android:text=" "
            android:id="@+id/sender2"
```

```xml
              android:layout_height="wrap_content"
              android:layout_width="wrap_content"
              />

</TableRow>
<!-- 4th row -->
<TableRow android:layout_height="wrap_content">
    <TextView
          android:layout_weight="70"
          android:id="@+id/subject3"
          android:text=" "
          android:layout_height="wrap_content"
          />
    <TextView
          android:layout_weight="10"
          android:id="@+id/date3"
          android:text=" "
          android:layout_height="wrap_content"
          />
    <TextView
          android:layout_weight="10"
          android:text=" "
          android:id="@+id/sender3"
          android:layout_height="wrap_content"
          android:layout_width="wrap_content"
          />

</TableRow>
<!-- 5th row -->
<TableRow android:layout_height="wrap_content">
    <TextView
          android:layout_weight="70"
          android:id="@+id/subject4"
          android:text=" "
          android:layout_height="wrap_content"
          />
    <TextView
          android:layout_weight="10"
          android:id="@+id/date4"
          android:text=" "
          android:layout_height="wrap_content"
          />
    <TextView
          android:layout_weight="10"
          android:text=" "
          android:id="@+id/sender4"
          android:layout_height="wrap_content"
          android:layout_width="wrap_content"
          />
</TableRow>
```

```
    <!-- 6th row -->
    <TableRow android:layout_height="wrap_content">
        <TextView
            android:layout_weight="70"
            android:id="@+id/subject5"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="10"
            android:id="@+id/date5"
            android:text=" "
            android:layout_height="wrap_content"
            />
        <TextView
            android:layout_weight="10"
            android:text=" "
            android:id="@+id/sender5"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            />

    </TableRow>
    <Button
        android:id="@+id/back"
        style="?android:attr/buttonStyleSmall"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:paddingTop="20dp"

        android:text="Back" />
</TableLayout>
</ScrollView>

</LinearLayout>
```

```
<!-- notification.xml -->
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="bottom"
    android:orientation="vertical" >

<Button
        android:id="@+id/back"
        style="?android:attr/buttonStyleSmall"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:paddingTop="20dp"
        android:text="Back" />
</LinearLayout>
```

```xml
<!-- signin.xml -->
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >

    <Button
        android:id="@+id/login"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Log in" />

    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Mobile Number"

android:textAppearance="?android:attr/textAppearanceMedium" />

    <EditText
        android:id="@+id/mobile_number"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="user name"
        android:maxLength="10"
        android:inputType="phone" >

        <requestFocus />
    </EditText>

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Password"

android:textAppearance="?android:attr/textAppearanceMedium" />

    <EditText
        android:id="@+id/password"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="Password"
        android:inputType="textPassword" />
```

```
    <Button
        android:id="@+id/signin"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Continue" />

</LinearLayout>
```

APPENDICES B

```xml
<!-- welcome.xml -->
<?xml version="1.0" encoding="utf-8"?>
<ScrollView
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >
    <TableLayout
        android:layout_width="fill_parent"
        android:layout_height="fill_parent"
        android:stretchColumns="1"
        >

    <!-- option part -->
    <ImageView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/banner" />

    <Button
        android:id="@+id/w_bt1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="My account"
        android:onClick="action" />

    <Button
        android:id="@+id/w_bt2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Course list"
        android:onClick="action" />

    <Button
        android:id="@+id/w_bt3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:onClick="action"
        android:text="Message" />
```

```
    <Button
        android:id="@+id/w_bt4"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:onClick="action"
        android:paddingBottom="10dp"
        android:text="Notification" />
      <!-- anouncement part -->


    <TextView

        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:textStyle="bold"
        android:text="Announcement"
        android:paddingTop="20dp"

android:textAppearance="?android:attr/textAppearanceMedium" />

    <ImageView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:clickable="true"
        android:scaleType="centerInside"
        android:src="@drawable/moog" ></ImageView>


<!-- ini anouncement 1 -->
    <TextView
        android:id="@+id/announce11"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="MASSIVE OPEN ONLINE COURSE" />
    <TextView
        android:id="@+id/link11"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text="Link here" />
<!-- ini anouncement 2 -->
    <TextView
        android:id="@+id/announce22"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=" />
```

```xml
<TextView
        android:id="@+id/link22"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text="Link here" />
    <Button
        android:id="@+id/download11"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:text="Download it" />
<!-- ini anouncement 3 -->
    <TextView
        android:id="@+id/announce33"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=" />
    <TextView
        android:id="@+id/link33"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text="Link here" />
    <Button
        android:id="@+id/download22"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:text="Download it" />
<!-- ini anouncement 4 -->
    <TextView
        android:id="@+id/announce44"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text=" />

<!-- ini anouncement 5 -->
    <TextView
        android:id="@+id/announce55"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=" />
    <TextView
        android:id="@+id/link55"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingBottom="20dp"
        android:text="Link here" />
```

```
    <Button
        android:id="@+id/download33"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:text="Download it" />

</TableLayout>

</ScrollView>
```

```
<!-- AndroidManifest.xml -->
<?xml version="1.0" encoding="utf-8"?>
<manifest
xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.phonebook"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="9"
        android:targetSdkVersion="17" />

<uses-permission android:name="android.permission.INTERNET" />
<uses-permission
android:name="android.permission.ACCESS_NETWORK_STATE" />


    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name="com.example.phonebook.FrontHome"
            android:label="@string/app_name"
            >
            <intent-filter>
                <action
android:name="android.intent.action.MAIN" />

                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>

        <activity
            android:name=".Home"
            android:label="Home"></activity>"
        <activity
            android:name=".MainActivity"
            android:label="Log in" >

        </activity>
        <activity
            android:label="Home"
            android:name=".Welcome"></activity>"
         <activity
            android:label="Signin"
            android:name=".Signin"></activity>"
```

```xml
        <activity
            android:label="My Account"
            android:name=".About"></activity>"

        <activity
            android:label="Course"
            android:name=".Course"></activity>"

        <activity
            android:label="Message"
            android:name=".Message"></activity>"
        <activity
            android:label="Notification"
            android:name=".Notification"></activity>"

    </application>

</manifest>
```