Mobile Notification System

By

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Dissertation submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
(Information & Communication Technology)

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CERTIFICATION OF APPROVAL

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in partial fulfilment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
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Approved by,

_____

(Dr. Anang Hudaya)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
May 2012

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

_____

(Puleng Joyce Jack Mack)

ABSTRACT

The number of mobile users increases each day, we can observe this growth especially among young people. A mobile device is a very useful tool not only for entertainment but for academic matters in Universities. Possessing a mobile device can be extremely important to establish a better communication among lecturers and students.

This project addresses Mobile Notification System (MNS) which will be used by lecturers and students in universities, specifically in Universiti Teknologi Petronas.

In case the lecturer needs to make an academic announcement in a more flexible and faster way, this system can be used to send notifications to students using SMS based platform.

This system comes to improve the communication between the lecturers and students in UTP, as well as make the learning process more interesting by introducing new forms of communication.

The methodology used for this project will the waterfall approach where there will be a development of a prototype, this methodology provides the user with the sample of the real system, so they have an overview of the entire system.

This system will be put among the various learning techniques and helpful tools that UTP provides.

ACKNOWLEDGMENTS

I would like to take this opportunity to thank the various people involved in making this project a success as well as those who supported and guided me throughout the Final Year Project I and Final Year Project II.

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Second, I would like to thank my supervisor Dr. Anang Hudaya for his wise guidance and fair assessment throughout the two semesters of Final Year Project.

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ABBREVIATIONS AND NOMENCLATURES

UTP – University Technology Petronas.

MNS – Mobile Notification System

SMS – Short Message Service.

SDK – Software Development Kit.

W/H – Wireless/Handheld.

SDL – System Development Life Cycle.

FYP – Final Year Project.

CHAPTER 1

INTRODUCTION

1.1 Background

'Mobile learning' is an emerging, and rapidly expanding field of educational research and practice across schools, colleges and universities as well as in the work place [1].

Mobile Notification System is a platform that allows lecturers and students to stay connected anytime and anywhere through a mobile device.

The availability of mobile and wireless devices is enabling different ways of communicating. Individuals now have easy and inexpensive access to mobile telephony and the cost of mobile access to the Internet is steadily being reduced [2].

In this project, we shall use these capabilities to ensure an effective communication among lecturers and students in campus.

The aim is not to challenge nor replace other forms of interactions (face-to-face in classrooms, lecture theatres and studios, or virtually in online learning environments): it is a supplementary method that can support, enrich and enhance students' learning experience [3].

The implementation of this system may be useful for lecturers as well as for the students in UTP.

The proposed system will not replace other types of communications in UTP such as the E-learning where lecturers usually post announcements of the latest academic events. This system comes to enhance and support other forms of communications that UTP already provides.

The use of mobile learning in this online college represents an attempt to encourage students' active participation in the learning process. It attempts to engage them in constructivist learning through social and intellectual interactions [4].
The development of this system may increase the university's credibility and promote a dynamic and interactive way of learning methodology.

1.2 Problem Statement

Many times communication off class between a lecturer and students in UTP is not well managed. Many complications may arise when disseminating information to students. E-learning is one way that enables lecturers to inform students about academic activities. The problem here is that in order for the student to access the information in E-learning, the student has to log in from their computers, sign in and only after that the information is made available. Sometimes students are not able to sign in through the computer because some of them do not have time at that moment or the E-learning system might be down. Coincidently, the information posted by the lecturer on E-learning may be urgent and important for the student but the students may not be able to easily access to it.

Another problem is that generally students feel the need to pay visit to a specific lecturer. Some students may go to the lecturer's office without prior notice, and sometimes the lecturer is not available at that specific time. In this case students have to wait, or call the lecturer's office or private number. At times these methods are not efficient when trying to reach the lecturer, especially when the situation is urgent.

1.3 Significance of the Project

The proposed mobile notification system will provide the main features to overcome the problems that were stated above. Lecturers will be able to keep their students updated about any academic activities anytime. Important announcements will not only be available in E-learning but students will get access to this information in their mobile through an SMS form. As for the students, communicating with lecturers in urgent cases will no longer constitute a problem for the reason that students will be back SMS to their respective lecturers and make appointments in advance.

Despite being unaccustomed to using their mobile phones for academic study, students willingly accepted SMS reminders from their tutor via a bulk texting service. Many students particularly valued reminders in support of their time management, an important self-regulating strategy known to be a component of successful transition [5]. According to this source we see that SMS system can bring a significant improvement during learning activities.

Once this project is concluded, this mobile notification system will show that students will be more aware of the classroom activities than they were before, because information will reach them in a faster and more effective way.

1.4 Objectives

The objectives of this project are:

1. Establish a better, faster and a more effective communication between lecturers and students in UTP.
2. Eliminate communication breakdown between students and lecturers.
3. Create a useful platform of communication that will be available only for lecturers and student in UTP.

1.5 Scope of Study

The project will cover Mobile Notification System, a system that will allow a better dissemination of academic information in UTP, lecturers will be able to deliver announcements through a Mobile Notification System using SMS platform.
This system shall include the following features:

1. The lecturer can send out notifications to the students if he/she has to miss the class on a specific day or time.
2. If the lecturer uploads study materials or information about tests, quizzes or projects in the E-learning, students can be notified of the news.
3. Students can also send out notifications to lecturers making appointments and get a faster response from their respective lecturers.

The main users for the application will be lecturers and students. In order to use this application there will be a need for the users to pursue a mobile with Android OS.

The system will be developed using Android Software Development Kit (SDK) platform which is set of development tools that helps in the creation of applications and utilities, NetBeans IDE 7.0.1, webserver and open source database MySQL.

1.6 Feasibility Study

Time Frame

This project has a duration of two semesters that consists of about 8 months. The first semester is allocated for the research studies, this research includes mobile learning and mobile devices that are used in the learning process as well as its functionalities. The second semester is allocated for the development of the system prototype and its implementation. The system development and testing is planned to be completed within the approximately 8 months given.

Market

Market research was performed to ensure this product is available in the market. Although the product is already in the market there will be additional features and improvement of this system. Initially the target market will cover UTP lecturers and students.

Technical

The system will be developed using NetBeans and Mobile Software Development Kit SDK which is collection of tools that allow the development of applications. A mobile device with android OS will also be necessary during the development and testing.

Financial

The project will only require a minimal amount of cost as most of the materials and tools are available for free in the internet.

CHAPTER 2

LITERATURE REVIEW

Education has always been one of the challenges that institutions face due to constant changes and improvement in the educational field.

Over the past ten years, educational researchers and practitioners, policy makers and politicians have mapped out a new landscape of learning as a situated and life-long activity. [6]

Education can take part anywhere and anytime, the formal education may not offer students with all skills required to learn, for this reason development of new technologies have to be done in order to align the students with the new and sophisticated technology inventions.

Technology is prevalent in today's society and teenagers are embracing it with open arms. It is the responsibility of the older generations to guide the youth through the media and technology world by not just teaching children about technology but by teaching them morals and values that will protect them and help them to develop in a healthy environment. [7]

As we see, the number of mobile users is increasing each year; it is our responsibility to take advantage of this constant growth to benefit our society. A development of a mobile notification system in universities shall bring a better and efficient communication in the learning process.

The traditional way of communication among lecturers and students presents limitations that may influence the students learning process and it might also bring frustration from the student's part. A new way of communication among lecturers

and students suggests the usage of a personalized and systematic (short message service) SMS to multicast important information related to learning activities.
Besides that, an interactive SMS service is also an important functionality provided by the system. This system can be used to render information on demand like detailed result, course material, reference book etc. while operating on interactive SMS mode. [8]

2.1 Problem

Concerns have been raised on whether or not the implementation of wireless/handheld (W/H) computing devices for mobile learning (m-learning) will bring any benefits for education; there are several reasons that led to this issue.
One reason why m-learning systems may not have been widely proliferated in education is due to a widening concern among faculty and administrators on the viability of the W/H devices in online programs.[9]

2.2 Outcome

But studies have shown that this practice may provide an interactive and enjoyable environment in the academic field.
The first study (Bollen, Eimler, & Hoppe, 2004) emulated a W/H device on a PC to allow students send SMS messages on various discussion topics which were aggregated and categorized by the instructor, using an electronic whiteboard, in the classroom [10].
This system worked efficiently and students showed interest in practicing this type of learning approach.

Mobile notification system does not necessarily mean that students learn through a mobile device but they interact and stay connected with their respective lecturers in a more efficient and convenient manner.
Mobile notification application is an excellent alternative for E-learning for the reason that it completes some features missing in E-learning solution.

CHAPTER 3

METHODOLOGY

The project will adopt the Agile and Prototype Software Development Methodologies and Waterfall Methodology that will be comprised of four main phases of the system development life cycle (SDLC). A Gantt chart of the project development is also included, it is described further in the project.

Agile Development is the methodology that accommodates changes and frequent adaption to alternative designs and revised models.
The prototype methodology is a great methodology for the project because it will provide users with the sample system, so users will be aware of the real system and if there is a need for changes then it can be done.
This project shall be based on iterative development stages. These stages include planning, analysis, design and implementation.

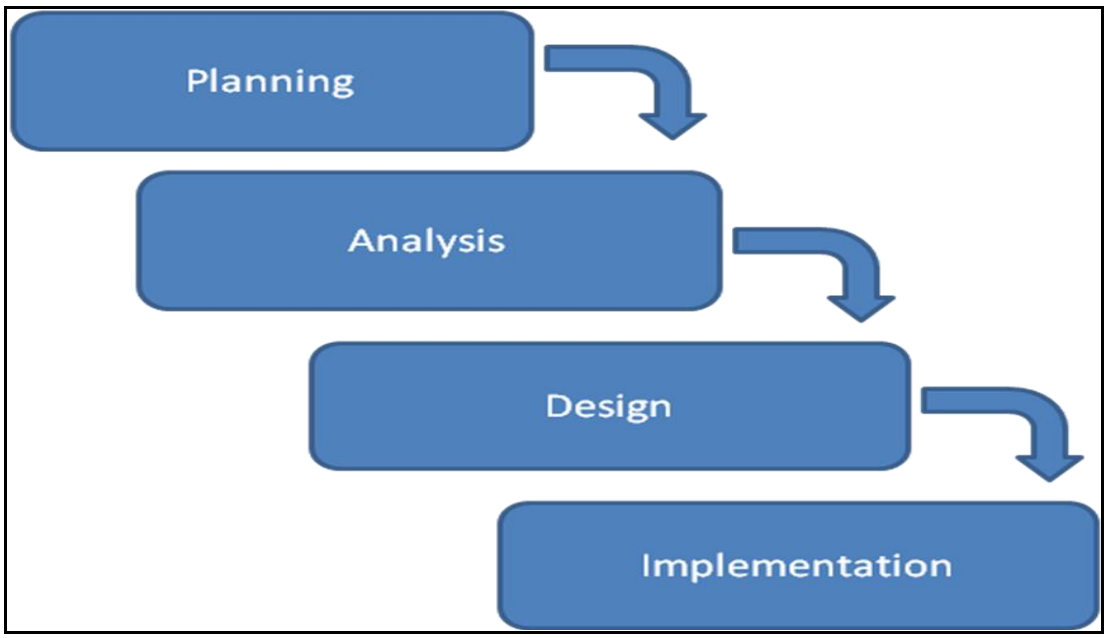

Figure 1: System Development Prototype

The figure above shows the main the stages of the system development life cycle towards the development of the prototype.

Each phase will be described below:

3.1 Planning

During this phase a feasibility study is conducted to ensure the success of the project within the time frame given. Projects activities and milestones were identified to ensure the smoothness of the project. Detailed study of the project is done to identify the main problems in the project and define the respective solutions. Research about similar system have been performed, these researches included similar system that have already been implemented in other educational institutions. A survey was conducted to get the students feedback regarding this system as they are one of the main targets users.

3.2 Analysis

In the Analysis phase, collection of relevant data was done to support the development of the project. The first questionnaire was conducted with 30 students enabling the detailed analysis as well as the importance of implementation of the system itself. During the short questionnaire performed with the 30 students in UTP, the question whether they would like to have such application or not was asked and the chart below shows the response of the students.

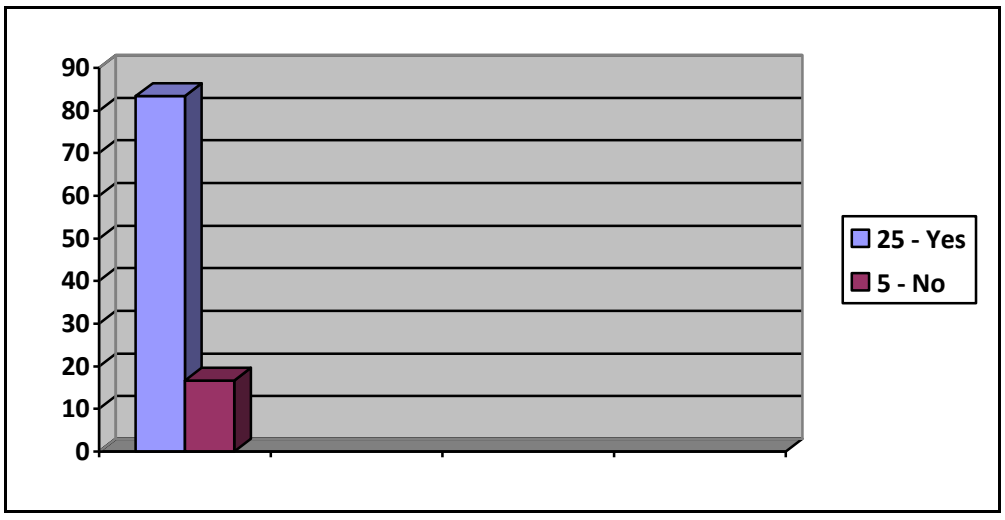

Figure 2: The likeness of the new mobile notification system

The vertical line represents the number of students who performed the questionnaire and the horizontal line represents their feedback towards the new product.

Although this survey did not include all students in the UTP, it gave an importance to the project.

The second questionnaire performed is more detailed and covers many students comparing to the first. After gathering all the data, the results will be useful when decisions need to be made.

This system might be very helpful to improve the interaction between lecturers and students in UTP.

3.3 Design

This phase involves modeling, designing and analysis. During this stage the decision should be made on how the system components have to be placed. In order to fulfill this process the application's objectives should be taken in consideration.

3.3.1 Application Conceptual Flow Model

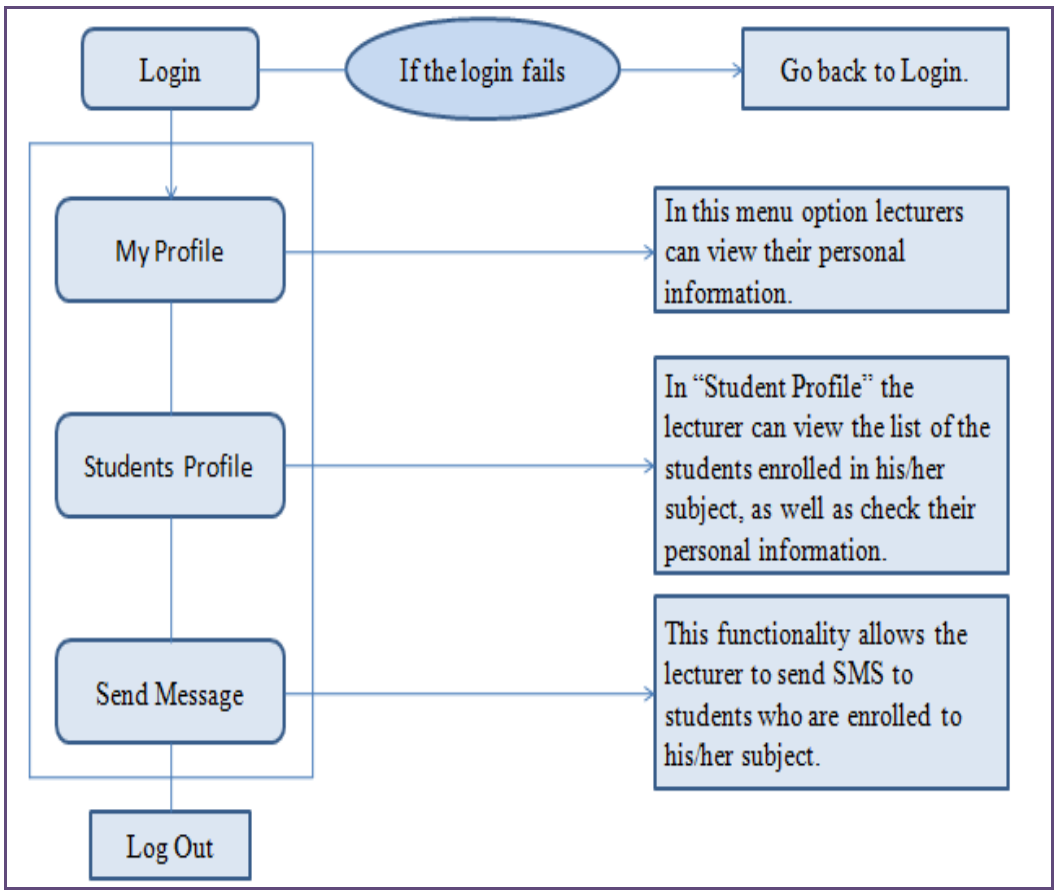

Figure 3: Conceptual Flow Model (Lecturer's side)

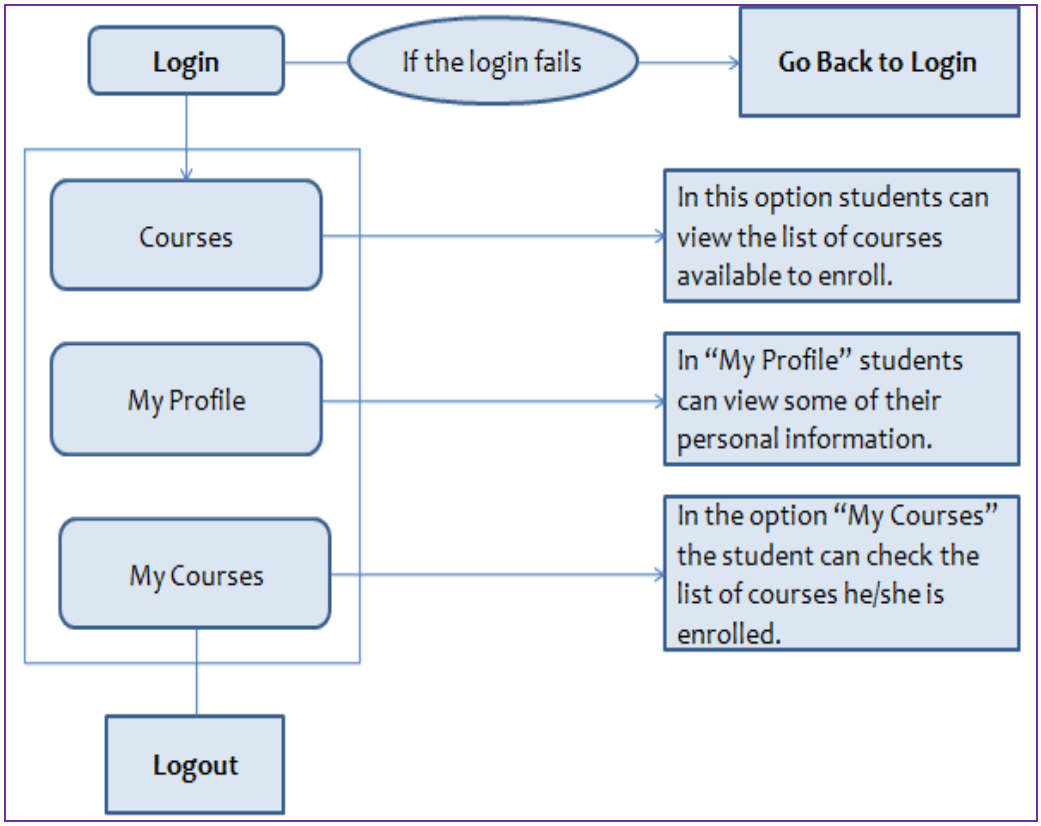

Figure 4: Conceptual Flow Model (Student's side)

3.4 Implementation

The last stage of the project includes the system implementation that involves programming codes and finally testing of the application.

During this phase the prototype will be created, most of the basic functionalities will be done. The first prototype will help determining the further functionalities and improvement of the final prototype.

3.5 Project Activities

There are several activities that need to be performed during the project development. The research and data gathering constitutes the initial phase, these activities will be important in collection of data that will be significant for the project.

Below are the activities that will be carried out throughout the project:

- **Planning the system requirements**

In this phase the project activities and key milestones were identified.

- **Data Gathering**
  - Questionnaires
  - Research

- **Data Analysis**

After the data is collected, several analyses should be made in order to get accurate information before proceeding to other activities.

- **System Design**

In this phase the proposed interface will be done as well as the workflow of the system. It will also explain how the system is planned to work, the system architecture.

- **System Development**

During this phase the components of the system will be placed all together in order generate the prototype application.

- **Testing**

In the testing phase there will be several tests that include:

Functionality and Ease of Use Testing – to verify if the important features are working as planned. Users

Graphical User Interface Testing – this test will verify if the users are satisfied with the system interface and whether the interface is well understood by the users. This test will help the project getting a clear feedback and future improvements of the interfaces.

Usability Testing – this test will determine if the mobile notification system is useful among students. The system functionalities will help users to navigate through the application. They will then determine if the system presents any positive outcomes and what kind of improvements could be done in order to make the system better.

Performance testing –this type of testing will be concerned with the effectiveness of the application. Factors such as response time, scalability and reliability will be well observed and recorded for future analysis.

Application Installation testing – as for the installation testing, it will be determined what types of set up are needed in order for the application to run in the mobiles.

3.6 Tools/equipment required

Below are the tools that will be used during the project development.

Software:

- Microsoft Word for the documentation.
- Microsoft Visio for the sketching.
- Android Software Development Kit (SDK)
- NetBeans IDE 7.0.1.
- Open Source Database to save lecturers and student's Login information.
- Web server
- PHP

Hardware:

- Wireless Network
- Telecommunication services

Equipment:

- Laptop to build up the programming codes for the application.
- Android mobile phone to perform the Demo.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Data gathering and analysis

The main objective of the survey was to get user's feedback regarding the Mobile Notification System. Their responses contribute towards the decision on the system requirements.

Questions asked in the survey

The survey performed was intended for UTP students taking any course, among them only 114 students responded the survey.

Below are the questions that were asked during the survey as well as the answers shown in percentage.

1. Could you state your programme?

The figure below shows that most students who responded the survey are in undergraduate studies, it constitutes 58.77% of the people who answered the survey.

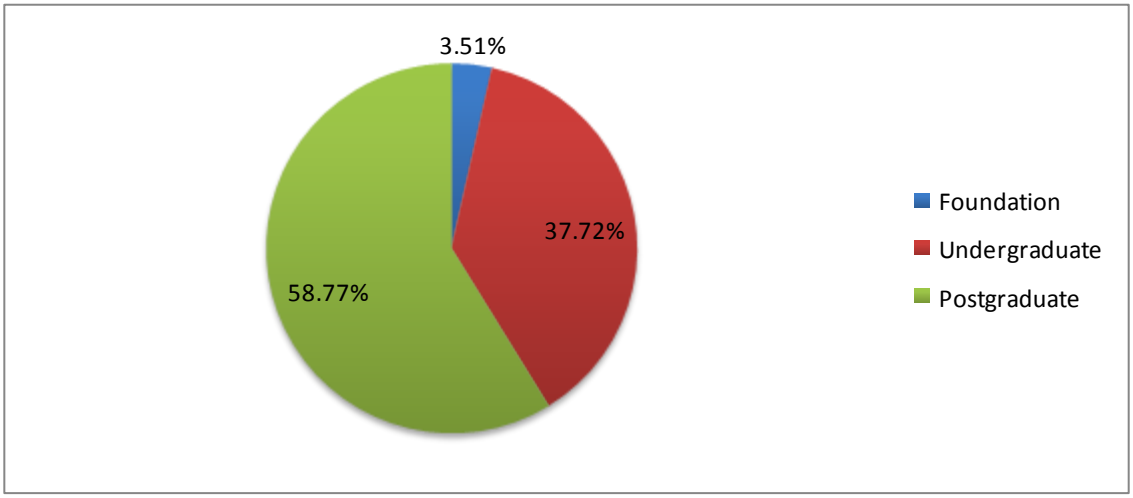

Figure 5: Question 1 Survey

2. What course are you taking?

Most of students are taking PE according to our survey results, it represents 31.58% of all students who responded to the survey.

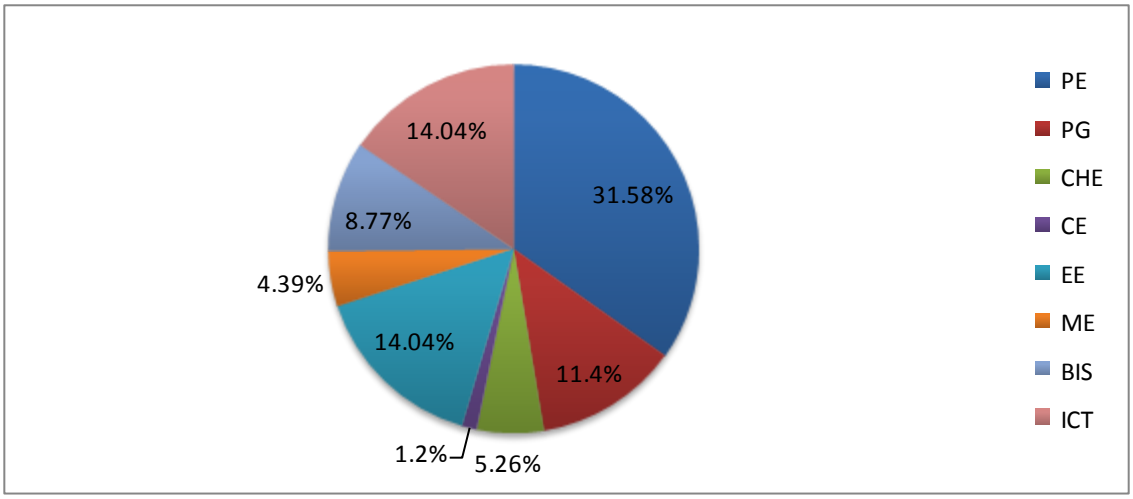

Figure 6: Question 2 Survey

3. Do you own a Smartphone?

This question was helpful during the survey because as it was mentioned before, this is a mobile application, so it is best if the users have a more sophisticated type of phone which will support the functionalities of the application.

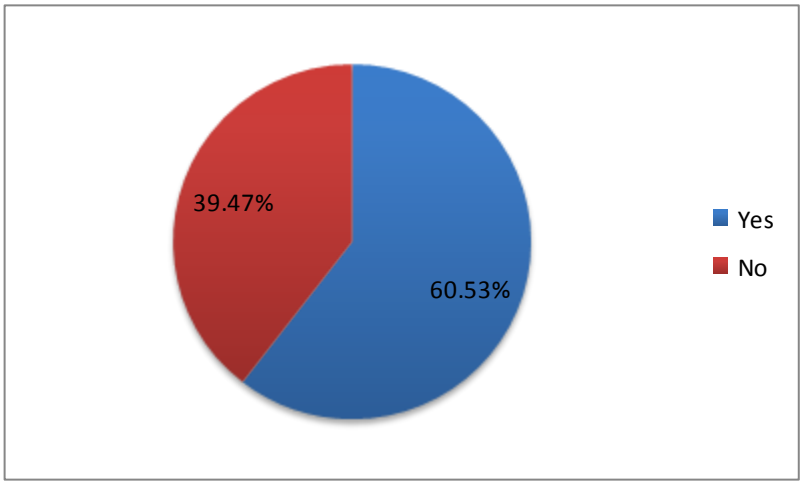

Figure 7: Question 3 of survey

4. How often do you use your mobile phone?

The response was positive and according to my expectations, 56.14% of the students said they always use their mobiles.

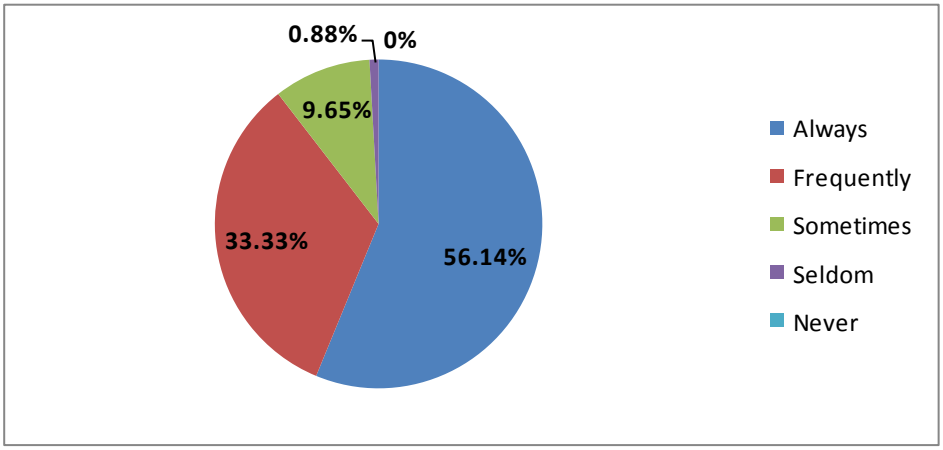

Figure 8: Question 4 survey

5. Which one of those do you have?

As I said before the Mobile Notification System, will be used in mobiles that have Android OS, this trend is growing each day. We can see the responses from the survey that 54% of the students who responded to the survey use Android OS.

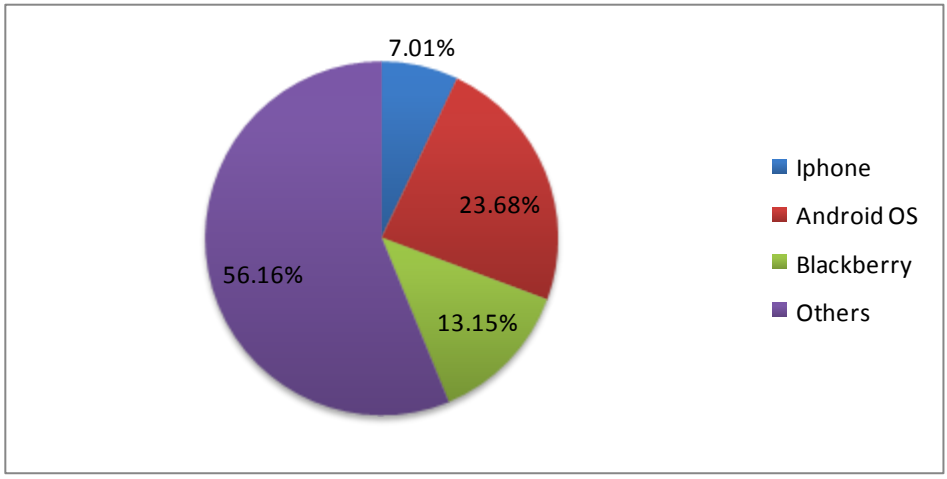

Figure 9: Question 5 survey

6. Do you think there is a lack of communication when lecturers disseminate academic information to students?

Most students answered to that question as “sometimes”, this answer will contribute to one of the objectives of this application which is to decrease miscommunication between lecturers and students in UTP.

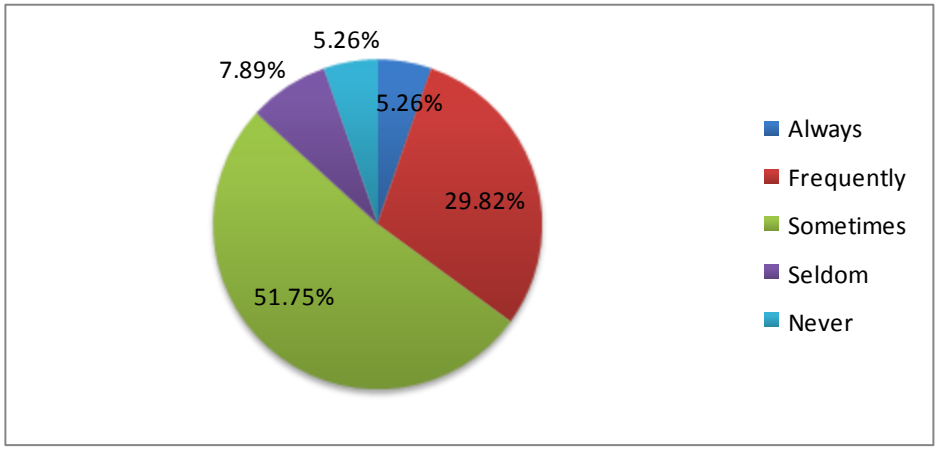

Figure 10: Question 6 survey

7. Do you usually get important announcements through your friends instead of your own lecturers?

Sometimes not all students get information through their respective lectures, some feel the need to ask their classmates and others stay without getting any information neither from the lecturer nor her/his classmate.

As the students answer to the question, they said “yes”, they normally get informed about important information through their classmates instead of the lecturers.

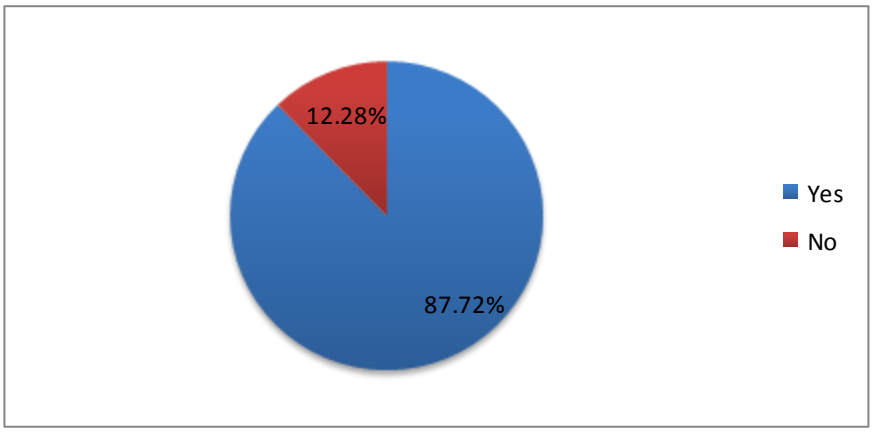

Figure 11: Question 7 survey

8. Does it represent a problem for you when you pay a visit to your lecturer and she/he is not in the office?

Most people do not feel satisfied when they go for consultation session in the lecturer's office and reach the office while the lecturer is not there. 84.21% of the students felt concerned by this issue.

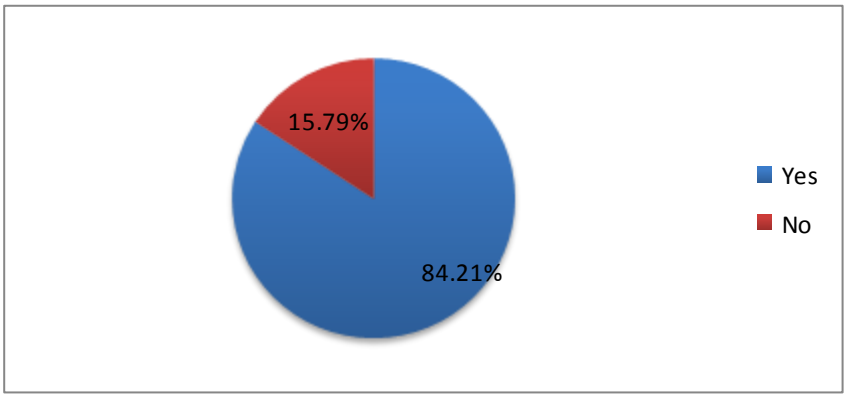

Figure 12: Question 8 survey

9. Is it all right with you to arrive to class and only then find-out that the class has been cancelled without a prior announcement?

Many times, classes are cancelled without prior announcement, and because students are not aware of that, they still go to class and only there find out the class are cancelled. 84.21% responded "Yes" to this question.

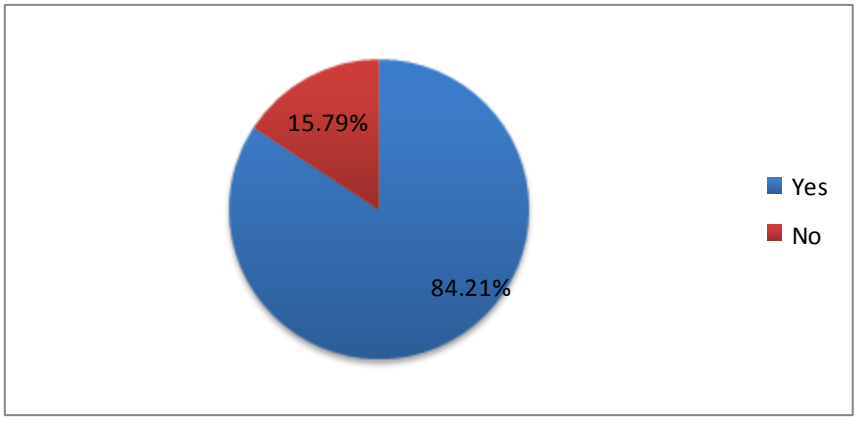

Figure 13: Question 9 survey

10. Would you prefer to be notified through your mobile phone in case of any class cancellations or announcements?

Since most of them always use the mobile, why can't the lecturer notify them if there is any emergency? So, when asked if they would like to be notified through their mobile many students responded positively.

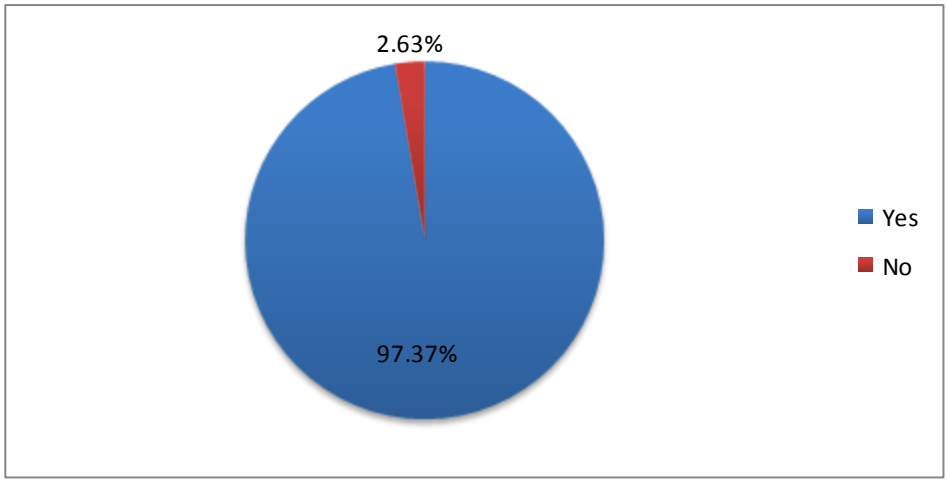

Figure 14: Question 10 survey

11. Do you think having a mobile notification system for lecturers and students in UTP, this facility would make the communication easier and faster between those two groups?

This response was very helpful in the development of the application, because the application received good feedback from the student. Based on their response, this application is something that would be useful for students as well as lecturers in UTP.

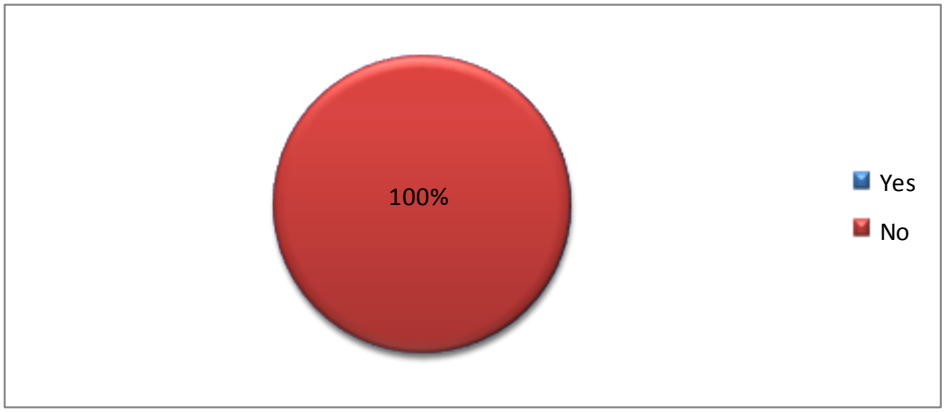

Figure 15: Question 11 survey

4.2 Results and discussion

The project aims to develop a prototype in order to simulate how the system works. Results were collected from the end-user (students) to verify the importance of the application and improve its functionalities.

This chapter is important for this project because with the collected data, the information was well analyzed and used to decide the main features of the system.

Prototype Assumption

During the development of it some assumptions regarding the system itself were made:

1. Assume that student's information was already saved in the database that is why there is no need for them to sign up in order to use the application. The only thing they must do is to download the application and login, their username is the ID number and password which will also be saved in the database.
2. The same idea was used in the lecturer's side of application, to use the system, lecturers must "Login", and there is also no need for them to sign up since all their registration information is already saved in the database.

This idea was based on UTP E-learning system, when using E-learning account, students do not have to register, the main information is already in the database. The only information the student must enter is the username which is the student's ID and default password which is also username. After login students can change their passwords to a more secure one.

Prototype

The prototype is developed to demonstrate in a more efficient way what the application does. Below are series of screen shots that explain further the Mobile Notification System.

Figure 16: Simple view of the menu in android mobile using Emulator

The figure above shows how the icons appear in the mobile. We can notice that there are two icons highlighted which are inside a box, those icons represent the application. The MNSstudent when clicked goes to the login page for the student and the MNSteacher goes to the login page for the lecturer.

Below there is a screen that appears when the icon for the lecturer and student application is clicked.

Figure 17: Start Screen

Figure 18: Login

The figure 18 shows the login that can be viewed in the mobile of the user.

Users need to enter their account information details such as Username and password, once this action is completed then users can move on and click the "Login" button.

We can see as well "Forgot Password", this function is used in case the user has forgotten her/his password, and it helps to retrieve the user's password.

Student's Menu List

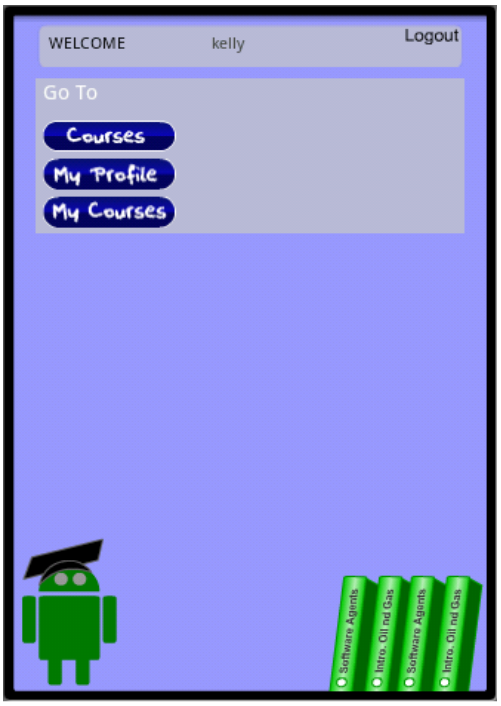

Figure 19: Student's Welcome Screen

The image above shows the "student's welcome screen", if the student successfully enters the username and the password logs in, it will lead the student to welcome screen.

The menu here is the welcome note, at the top left we can see "Welcome Kelly" this is an example on how it appears. Next to "Welcome" we have the "Logout" button that can be used anytime the student no longer wishes to use the application.

The other menu button is "Go To Courses", this menu shows a list of courses available where students can choose from and enroll.

Once students are enrolled in a specific course, this student is then able to receive SMS from their respective lecturer.

Figure 20: List of courses available to enroll

Figure 20 presents a list of courses that are available and from which students can select, and once the course is selected then the student can enroll.

Figure 21: Student's Profile

The image above shows the student's profile, where the student can view his/her basic information such as name, year of study, mobile number, email and can also upload a picture.

Figure 22: Enrolled Courses

In the menu "My courses" students are able to view the list of the courses they have enrolled.

Lecturer's Menu List

Figure 23: Teacher's Welcome Screen

The figure above shows the teacher's welcome screen, in this screen there are two menus available the "Students Profile" and "Send Message".

Figure 24: List of Students Enrolled

If the lecturer clicks the menu "Students Profile" he/she will be able to view the list of the students who have enrolled to the subject. Figure 24 show us two students which are "Moe" and "Kelly". When the name "Moe" or "Kelly" is selected, then the teacher can view the personal information of those students.

The image below shows the two profiles of the students:

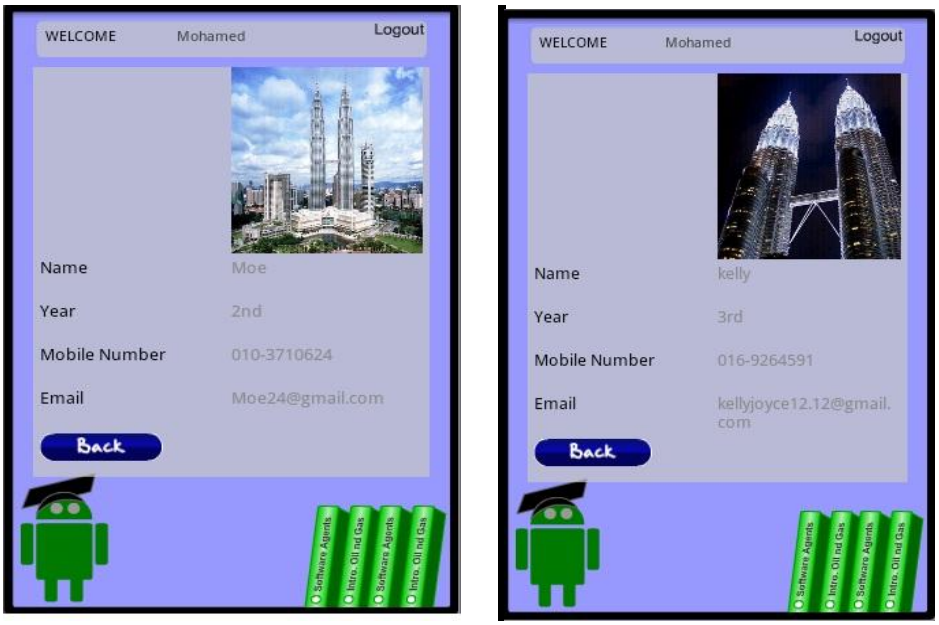

Figure 25: Lecturer viewing the personal profile of student 1 and 2

Figure 26 shows the screen that is viewed when the lecturer sends a message to his/her respective students. The lecturer has an option to "Send To All" or "Send To Selected".

Figure 26: Send Message Screen

The option “Send To All” allows lecturers to send SMS all students that are enrolled on his/her subject but the lecturer can decided to send SMS specific people in the list.

In figure 27 it is possible to view how this process of selection occurs.

As we can clearly see, the lecturer can select any student he/she wants, so the SMS will be delivered only to that specific student.

Figure 27: Students being selected

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

Conclusion

This project has described the development of a Mobile Notification System which is a platform of communication between lecturers and students off class.

The main goal of this project was to create an efficient and fast way of establishing communication among the different groups within the campus.

All the analyses and research made during the project development were very helpful in building the prototype.

This application will allow an alternative way of establishing communication between lecturers and students, information given by lectures will spread faster among students and it will it will create a better interaction among the users of it.

Hopefully, this system will be useful for UTP lecturers and students.

Recommendations

The Mobile Notification System has a good potential and still there are more improvements that can be done, below are some recommendations for future progress:

a. Implement this system in UTP so that lecturers can notify students about important events using a different platform besides the E-learning facility.
b. To implement this system, there should be a connection between the MNS and UTP database.

c. In order to reduce costs of sending SMS, UTP could establish a deal with the different mobile service providers.
d. In the first phase of Mobile Notification System the implementation of the application should be done with sample of few lecturers and students to test its effectiveness and efficiency.

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APPENDICES

A. Gantt Chart

	Progress
	Dateline/Milestones

No	Task Name	SEPT'11	OCT'11				NOV'11				DEC'11			
		Week												
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Final Year Project I													
2	Proposal Submission													
3	Proposal Approval													
4	Planning													
5	Analysis													
7	Conduct the survey													
8	Viva FYP													
9	Submission of interim Report													
10	User Requirements Interface Design													

Table 1: Gantt chart (FYP I)

No	Task Name	MAY'12		JUNE'12					JULY'12					AUGUST'11		
		Week														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Final Year Project II															
2	Survey analysis															
3	More research on developing Android apps with NetBeans															
4	Prototype implementation															
5	Progress Report Submission															
6	System testing															
7	Pre-EDX															
8	System updates															
9	SEDEX															
10	VIVA															
11	Submission of Dissertation															
12	Submission of Technical Paper															

Table 2: Gantt chart (FYP II)