Course Registration via GSM Mobile Phone

by

Nurul Hamidah Ab Salam

Dissertation submitted in partial fulfilment of

the requirements for the

Bachelor of Technology (Hons)

(Business Information Systems)

MAY 2011

Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

Course Registration via GSM Mobile Phone

by

Nurul Hamidah Ab Salam

A project dissertation submitted to the

Business Information Systems

Universiti Teknologi PETRONAS

in partial fulfilment of the requirement for the

Bachelor of Technology (Hons)

(BUSINESS INFORMATION SYSTEMS)

Approved by,

(Mr Hilmi Bl Hasan)

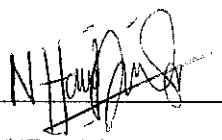
UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

MAY 2011

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.



NURUL HAMIDAH AB SALAM

Abstract

"Course Registration via GSM Mobile Phone" project is system for student to view current subject that has been registered for the students based on program and year taken. It is a process in universities to keep all the records regarding subject registered for next semester through mobile usage that could reduce time consuming for students and limited network connectivity. The objective of this project is to develop an alternative for students to register their desired course instead of using online registration. Services are being created to enable mobile devices perform many activities of the traditional internet using a variety of platforms, although in a reduced system for mobile devices. Literature review explains about related citation and article regarding mobile marketing, SMS definition and Premium SMS service which the service that is provided by Trio Mobile Company. RAD prototyping is selected as the system development methodology in ensuring the system can be develop within the timeframe based on Final Year Project II scope of project. The methodology explained about research elements used in this report such as survey, appointment and interview and also signing the agreement with Trio Mobile Company. For result and discussions, it views the current prototype designed together with the screenshot of the system so that a clear view can be seen. It also shown the database design using MySQL and proposed system based on results of the survey done to 51 UTP students. The report concludes with an evaluation from students as the user and the recommendation needed in improving the project for future used.

Acknowledgement

The main objective of preparing the report is to develop a system which can overcome the problem regarding course registration for all courses in Universiti Teknologi Petronas and progress of the system developed. The report focused on steps required and action taken in order to complete the systems.

High appreciation for those who helped to complete this report especially to my Final Year Project Supervisor, Mr Hilmi B Hasan for his guidance in completing the project. He really helps a lot especially on designing and database creation. This project teaches me on problem solving strategy and I was exposed to many types of programming language such as Java Mobile Emmbedde (J2ME).

Not to forget, to Trio Mobile company as they are in charge for establishing the network between telco companies such as Maxis, Digi and Celcom. Trio Mobile is well known for their best services in handling Premium SMS Service and Bulk SMS service to make sure the system can be delivered to the end users successfully through mobile phone. Trio Mobile also gives advices on how to make sure the system meet the requirement and can be display into the phone.

Lastly I would like to express my gratitude to all my friends for giving best cooperation during project development and helping me a lot in completing my tasks. Thank you to all who had participated for endless support and encouragement.

TABLE OF CONTENTS

Abstract

"Course Registration via GSM Mobile Phone" project is system for student to view current subject that has been registered for the students based on program and year taken. It is a process in universities to keep all the records regarding subject registered for next semester through mobile usage that could reduce time consuming for students and limited network connectivity. The objective of this project is to develop an alternative for students to register their desired course instead of using online registration. Services are being created to enable mobile devices perform many activities of the traditional internet using a variety of platforms, although in a reduced system for mobile devices. Literature review explains about related citation and article regarding mobile marketing, SMS definition and Premium SMS service which the service that is provided by Trio Mobile Company. RAD prototyping is selected as the system development methodology in ensuring the system can be develop within the timeframe based on Final Year Project II scope of project. The methodology explained about research elements used in this report such as survey, appointment and interview and also signing the agreement with Trio Mobile Company. For result and discussions, it views the current prototype designed together with the screenshot of the system so that a clear view can be seen. It also shown the database design using MySQL and proposed system based on results of the survey done to 51 UTP students. The report concludes with an evaluation from students as the user and the recommendation needed in improving the project for future used.

Chapter 1
Introduction

1.1 Background of Study

The area of study focused on the needs of university students on registering courses for upcoming semester. Target audience for this report is among Universiti Teknologi Petronas (UTP) students and the tester for project implementation. Data communication and networking subject is also other field of study that involves in developing the network stability and to make sure that communication can be developed through the best network selection. Adequate support from programming language such as PHP programming is important in terms of building up the design and interface for the project. Research and study about mobile banking prior to the relevancy of the project helps to improve the process of implementing new technologies for course registration process as it is another element of study for the project.

1.2 Problem Statement

UTP students faced problem with current course registration tools which is via online application. The problem occurs when some of course session always full and it caused users unable to register their subject according to the course taken guidelines. Limited internet connectivity appears to make registration process difficult to be completed by the students. It is not only affected students but also lecturers need to add more session to enable students to register course offered. Online course registration caused the process of registering course become longer as the delay of loading pages for certain course takes longer times to complete.

1.3 Objective and Scope of Study

Main objective of the project is to develop a system based on mobile device services which enable students to enroll and register course without having any problems or miscommunication regarding courses offered to them. Others objectives also available in this project:

i. To develop an alternative to check for registration status for new semester whereby students can use mobile device services instead of using online registration to avoid buffering pages or limited internet connectivity.

ii. To implement the usage of mobile application through SMS service and adopting UTP services into different approach.

iii. To create better understanding about SMS services and process of developing system through mobile embedded system.

The scope of study for development of the project focused on designing the interface of course registration via mobile application, build up network connection through SMS gateway and database creation to keep the record for students based on course taken according to semester taken.

1.4 Relevancy of Project

The creation of this project named "Course Registration via Mobile Phone" is to overcome problem regarding course registration via internet. The project will focus on the solution for students register course offered via GSM services and target market for this project are students from universities especially UTP students. Nowadays, mobile is one of the necessary needs for everyone. It is easy to carry and most of us know how to use all the applications applied in mobile. Using SMS as mechanism to register course in terms of speed and save cost as compared to WAP services.

This project is a system which consists of a menu which allows students to register and drop course taken once new semester start. Users need to subscribe for first time use to use this application which may cost a few cents and once they had successfully subscribed, a command will be given to them to allows them registering the course.

1.5 Feasibility within Scope Study and Timeframe

Feasibility analysis is done for guide in determining whether should proceed the project or not. This analysis consists of three analyses which are as follow:

1.5.1 Definition

- Project size
  - Number of people: Two (Nurul Hamidah & Mr Mohd Hilmi Hasan)
  - Timeframe: (February 2011 – September 2011)
  - Features: Course Registration via Mobile Phone
- Compatibility
  - Register course through mobile phone and apply same application with mobile banking
  - More convenience and accessible anywhere anytime

1.5.2 Process Requirement

Course Registration project is mainly based on the current course registration implemented in Universiti Teknologi Petronas. It is based on the online course registration but using different medium to register course. There are several requirement needed for the end users to fully utilize this service such as:

The processes available are slightly different with current online systems as it gives the users to send request and receive feedback accordingly about course registered.

a) **Login**

Students are given a unique ID to login and each student has different ID based on matrix number. One time password is required to access the page and is given by the service provider.

b) **Register course via SMS**

Once successfully login, students can register related courses for next semester.

c) **Request for help**

Students having problems with the system can send SMS to request for help.

d) **Receive feedback and response from registration department**

Registration department will update users with any announcement regarding course through mobile phone.

Student

Students are the end users which will use the system to register their course for upcoming semester. They need to fulfill some requirement such as login and register course through short message service (SMS).

i. **Login**

Student is required to login based on their matrix ID and enter correct password. A notification will appear once they entered the wrong password.

ii. **Compose new message**

To register for new course, student has to create a new message through mobile phone and enter the course code based on programme taken for upcoming semester.

iii. **Send message**

Once student type the correct course code together with the course name, student needs to press button send to register the course.

iv. **Successful registration**

A notification will be given once student had successfully register the course.

1.6 Problem Encounter

There is some problems encounter with the project implementation which interrupted the process of applying the new systems for the future used. Below are the problem lists:

1.6.1 Economic Constraints

Research based on economic perception in terms of cost and charges required to develop the project in order to determine whether the project should be build or not.

- Development cost
  - Hardware for Mobile Phone – less expensive
  - Software (SMS software and mobile application) – open source (free)
  - Poster creation – RM55
  - SMS Keyword by Trio Mobile – RM100 each
- Connection Fees
  - Due to budget constraint, it is difficult to execute the keyword for SMS login purpose because of limited budget for Final Year Project. One keyword cost RM1000 for company and individual purpose. Therefore, it is difficult to apply the keyword for first time login for final year project purpose.
  - Below is the details on the cost involved in establishing network connection for SMS service:

Connection Fee

Content Provider undertakes to pay Trio Mobile:

First Year	: RM 100.00 for 1st Keyword
Subsequent Year	: RM 1,000.00 for 1st Keyword
Setup Fee	: Nil
Month Access Fee	: Nil

Profit sharing after Telco deduction : 85% - Content Provider, 15% - Trio Mobile

Additional Keyword

Subsequent keywords (Bulk Purchase)	**Price per keyword (same feature as Premium SMS above)**	**Total Amount**
1	RM 800	RM 800
3	RM 700	RM 2,100
5	RM 600	RM 3,000
10	RM 500	RM 5,000

Operator Fee and Charges

Below are the percentage revenue share kept by the respective Operators per message and these percentage are subject to change by the respective Operators

Operator	**Premium SMS**	**Subsequent MT in one message**
Maxis	42%	RM 0.10
Celcom	53%	RM 0.00
DiGi	40% + RM 0.07	RM 0.07

Administration Disbursement Fee

For each disbursement amount, administration fee of RM15.00 will be imposed

Other charges

Each change of existing live keyword : RM 500
Suspension of shortcode penalty : RM2,000

Chapter 2
Literature Review

Overview

Mobile device is a common technology used nowadays as it considered as humankind primary tool. It is a gadget which is capable in browsing internet instead of sending text and multimedia message. With this ability, "Course Registration via GSM Mobile Phone" Project appears to be an alternative for university students to register subjects for next semester. This project consists of mobile software development which it is used as an application for mobile devices that utilize students on course registration process. Furthermore, this project is only required a mobile phone to enable users to use this application because it is connected through SMS gateway and no internet access required. Applying the concept of mobile marketing, this project manipulate the usage of mobile in delivering information and capturing data from students' details thus keep the record into registration database.

2.1 Implementation of Mobile Marketing

This project is totally implementing the usage of mobile marketing in order to give profits to the university based on total number of students registering through this service. Basically, each SMS is cost based on the rate stated by the Telco companies such as Maxis, Digi and Celcom for Malaysia telco service provider. The literature below is highly related to the implementation of mobile marketing and how it can be implemented in the future based on keyword given form service provider.

"Mobile advertising has raised considerable interest as mobile technology has advanced and companies world-wide are starting to use not only text messages, but also

multimedia messages in their mobile commercial communication." (***Manninen 2004 and Taulavuori 2005***).

Based on the above citation, it shows that mobile marketing has been highly implemented in today's business life and manipulate the usage of marketing in capturing the target market interest towards the needs of mobile technology.

2.2 Definition of SMS

SMS stands for Short Message Service and t is a technology that enables the sending and receiving of messages between mobile phones. SMS first appeared in Europe in 1992. It was included in the GSM (Global System for Mobile Communications) standards right at the beginning. The GSM and SMS standards were originally developed by European Telecommunications Standards Institute (ETSI).

An SMS message is very limited in terms of data held. One SMS message can contain at most 140 bytes (1120 bits) of data and one SMS message can contain up to:

a) 160 characters if 7-bit character encoding is used. (7-bit character encoding is suitable for encoding Latin characters like English alphabets.)
b) 70 characters if 16-bit Unicode UCS2 character encoding is used. (SMS text messages containing non-Latin characters like Chinese characters should use 16-bit character encoding.)

SMS text messaging supports languages internationally. It works fine with all languages supported by Unicode, including Arabic, Chinese, Japanese and Korean. SMS messages can also carry binary data besides text,. *(Source: http://en.wikipedia.org/wiki/SMS)*

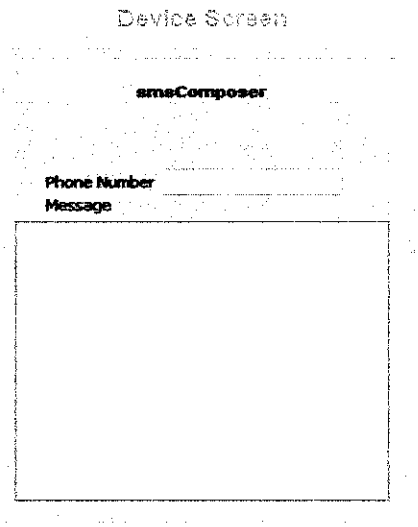


Figure 1 SMS Composer Interface

2.3 Premium SMS Service

SMS service has grown rapidly for marketing and advertisement purposes as it provide faster and efficient service. As SMS service has become the most preferable service, it helps people to complete several processes in a short time and more convenience. Therefore, Course Registration via Mobile Phone takes this opportunity to apply SMS for course registration process through Premium SMS Service which also known as Reverse Billing. Premium SMS service creates a new context for system development and being used rapidly in contract development, product development and in-house development ***(Grudin 1991).***

This service provides two-way of services whereby users can get response accordingly based on request sent and is more convenience as it does not cost any software updates or any setup fees. It also creates a connection with all the telco services such as Maxis, Celcom and Digi companies. Hence, it provides together with shared code rental and connectivity to make sure the smoothness process of SMS service. "*In fact premium SMS billing is a very convenient method to make remote payments as long as it does not imply any sophisticated procedures for buyers and it is very attractive for sellers because the penetration of mobile*

*phones is very high if compared to the accounts opened with banks and payment systems" **(Ecommerce Journal, May 19,2009).***

Network for Premium SMS service consists of some tools to build which are:

a) **SMS Gateway**

Translator for SMSC protocol is to connect between two different companies and for exchange data for inter-operator for SMS message.

b) **Mobile & Web Applications**

Application that will be delivered to end users

c) **Mobile Network Operator**

Refers to network provider such as Maxis, Celcom and Digi

d) **Mobile Phone Subscriber**

End users which subscribe their phone to use the application

(source: www.trio-mobile.com)

2.4 Pre-requisite Course

Currently, students are unable to register the per-requisite course if they fail the previous subject. "Parents and students should understand that requesting a related arts course through online registration does not guarantee that the student is placed in the course the next school year". ***(Al-Bastaki, 2005)***. However, using mobile application to register the course, students can overcome the problem by sending request to the registration department and once students received the permission to register the course, they can proceed with the registration process for next semester. Students also are having difficulties in viewing the status of pre-requisite course as they need to refer to the guideline before registering the course. This situation appears to be the problem for them as they need to recall back what are the courses that they have already took on previous semester. Therefore, this project provides a solution for students as the courses are

automatically being added on the list for next semester. ***(source: www.utp.edu.my)***

2.5 Definition of Course Registration System

Web-based system allowing students to enroll the page for class registration every new semester begin. This system is designed to enable students record the subject and reserved a place for next semester. As for example, UTP implemented online course registration to enable the students registering subject taken for next semester and more convenience without requesting students to come and register the subject manually. However, current online course registration appears to have more problems in terms of loading page and accessibility of course registration. Therefore, registering course via mobile application appears to be another alternative to register course for upcoming semester.

Mobile application for course registration offers the page for registration purpose as the main content and followed by several items such as status registration and registration summary. Previously, in online course registration for UTP students, it only allows students to access the page once during course registration. However, with the existence of 'Course Registration via Mobile Phone' project, it allows students to access the page anytime and anywhere. Through this project, it is not only gives priority to students, but also to the registration department to monitor the flow of registration process. Hence, it helps to track list of students that unable to register their course. This project also provides registrar staffs to send update through mobile phone for all students registered for any announcement regarding course registration. The items available in this project are as follow:

- Program
  - For example, Business Information System students
- Session
  - Semester taken the course (July 2011)

- Course offered
  - Automatic listed on the menu (Advanced Database System, Management Accounting)
- Course availability
  - Shows whether the course offered has been barred or can be added based on previous exam result.

All of the items above will be placed in the main page as it gives clear information about the course that users already added in the registration process. Once users successfully login, main page of the project will be displayed and they can preview the details of the owner before proceed with next process. Different with online course registration, this project provides best performance of network and faster response received from service provider to enhance the efficiency of registration process.

2.6 Login authentication (SMS One Time Password)

Course registration via mobile application tends to apply the same application but using mobile device as a medium to transmit data and information. It applies SMS one time password whereby students are required to enter their student ID which already registered in online course registration website and choose to enter the phone number at which they can be contacted immediately from their previously registered phone numbers. The user will be instantly called or receive an SMS text message with a unique, temporary PIN code once they have successfully register their phone number on the website. Then, they can use the system in their mobile phone by entering the PIN code and only registered students can login through this system. For example, database will keep all the students' information in the database and once they register their ID, database will retrieve the record to allow students to login.

Chapter 3

Methodology

Introduction

Explains about method used during research and how it is being implemented for data gathering purpose. Consists of three type of elements that had been used and manipulates the element into process which has been used as the guidelines to develop the system. Adopting RAD prototyping as the system methodology, this project used this method for development purpose and improving the current system through network connection.

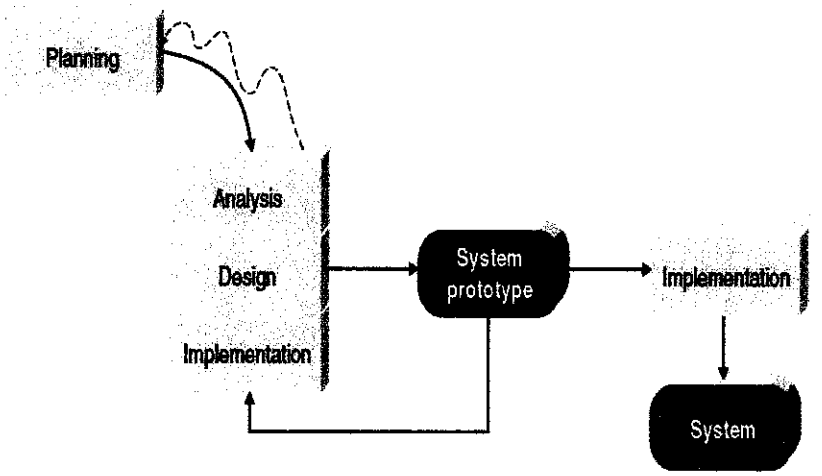


Figure 2 RAD Prototyping

The advantages of applying this method in system development process are it gives the opportunity to the customers (end users) giving the opportunity to evaluate the system prototype and improvement can be done based on requirement gathering with regards of system prototype. Other than that, testing on code implementation also helps to track the errors occur on coding process and leads to maintenance process that can be done based on result of testing.

RAD Prototyping consists of four main phases such as Planning, Analysis, Design and Implementation. For this project, once planning phase has been done it will continue to the analysis and design which lead to the development of system prototype. The prototype design then will be implemented through some testing to the sample of users. Then, evaluation from sample of users is important in order to gather data for improvement and fixing errors. Once the evaluation completed, it will be implemented and launch in the mobile phone.

Planning

First step before developing the project is planning phase. This step focused on identifying the needs of the project and the reason of developing the new system. Identifying problem statement can be the main thing to be done as it helps to track the needs of the end user. For this project, weaknesses of current online course registration contribute the idea of registration course via mobile phone. Then, decide on which tools to be used is the next thing to be done for system development process. Questions such as below are raised in order to implement the planning phase:

- **What is the system all about?**
- **Why new system needs to be developed?**
- **Who will build the system?**
- **What will the new system be?**

Analysis

This project helps students to register course offered through mobile phone and to overcome time consuming matters during course registration period. To use this application students have to register their details to the SMS gateway and a unique number will be given to them for identification and security purposes. Once they had successfully register through mobile phone, they can access the system 24 hours without

worrying about internet connection and they can access the system anywhere at any time. Analysis process follow the guideline below:

- **Who are the end users?**
- **What are the improvements needs to be done?**
- **How much will the new system cost?**
- **When the new system can be used?**

Design

This phase focused more on design interface for system prototype. It is the most crucial phase as it gives clear picture of the new system that is going to be developed. Below is the list of requirement needed in implementing design phase of RAD prototyping:

- **System design**
- **Network architecture design**
- **Interface design**
- **Database & file design**
- **Object design**

This part will be explained more on Chapter 4.

Implementation

Once planning phases completed, it will continue with analysis, design and implementation through the development process to develop system prototype. System prototype is design to identify the needs of new system and implement it at the same time after the designing process. This implementation refers to codification process for new system which means translating the design into coding process. The design of system prototype helps to determine the needs of software used whether should purchased the packaged software of developed the system using outsourcing or expertise.

3.1 Research Element

- **Survey**

  This survey is done among UTP students as they are the end users for the system developed to identify the weaknesses of current online course registration. Based on the result of the survey it will identify the improvement of the new system developed and the concept of the new system as for the action to overcome the weaknesses of the current system.

- **Appointment and interview**

  Trio Mobile is the service provider for the new system as it gives the opportunity to develop a connection between network provider and mobile phone subscriber. The interview between service providers is being held to identify the needs and requirement of new system before it is used by the end users. Appointment has been arranged between the creator and service provider in order to determine the ability of the system to be developed in the future.

- **Agreement with service provider**

  Trio Mobile achieved agreement to collaborate with the development of the project as they provide free trial version special only for this project. An agreement has been achieved in order to make sure that the system can be developed based on the timeframe stated. *(refer Appendix)*

3.2 Project Activities

No	Activities	Week												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Planning on design interface														
2	Collaboration with Trio Mobile														
3	Develop system database														
4	Receive keyword for system														
5	Linked system to database														
6	Evaluate the prototype														
7	Improve system and fix errors														
8	Test the system														
9	Implement system after testing														

3.3 Gantt Chart

Task	Start	End	2011
Data gathering	5/9/2011	6/17/2011	
Software and tools required	6/17/2011	7/1/2011	
Progress Report Submission	7/2/2011	7/4/2011	
Design prototype	7/5/2011	8/1/2011	
Pre-EDX presentation	8/2/2011	8/3/2011	
Dissertation Report	8/3/2011	8/9/2011	
Viva Presentation	8/10/2011	8/19/2011	
Submission Technical Report	8/20/2011	8/24/2011	

3.4 Tools Required

This project is mainly about developing a system which will be embedded in the GSM mobile phone. To develop the project, open software is selected in order to complete the system development and shown as below:

- Software involve

  For the application inside mobile phone, programming tool involves is using Java programming to design the interface of the application. Netbeans is the compiler for Java whereby it runs the interface for login interface. Login interface is design through Netbeans and will be linked to the mobile device which required users to key in username and password given. SMS gateway also one of the tools required for design process.

- Network

  To connect the system developed, SMS gateway is needed to implement the system into GSM mobile phone. Trio Mobile is the company in charge for establishing the network and they have given the API to connect with the

gateway. This API code will be implemented into PHP coding so that it will linked to the system and retrieve data form database.

➢ Database creation

A database is needed in order to keep all the records of successful login for students based on their ID registered. Using MySQL as the medium to store the data, this database consists of four (4) tables which are:

- **Login**

  This is the table whereby it stores the entire successful authentication for course registration. It consists of ID and linked to student table.

- **Student**

  A table of database which stores all the login details and divided into ID, name, program and year. Once a student had successfully registered, the table display name, program and year taken based on student ID.

- **Course**

  It stores all the details about current subject that available during the semester taken and linked the subject taken based on program. For example, BIS student will have to take 'Computer Organization, Internet Programming, Business Accounting' for next semester for First Year student. This data will be synchronizes as all the First Year BIS students will take the same subject on next semester.

- **Prog**

  Store the entire programs that available in UTP such as BIS, EE, PE, CE, CV, ME, and ICT into a table called 'Prog'. There are five (5) programs available for engineering program and two (2) programs for technology program. All these data then will be chunked into a small group of data based on year taken such as (First Year, Second Year, Third Year and Fourth Year).

Chapter 4

Result and Discussions

Result

The result is basically explains on the interface of the project and shows the screenshot of the system before proceed to the launching process of new system. It is also focused on database record which will be used to store the information of course registration.

4.1 Data gathering / Data Analysis

Firstly, before designing the prototype, some information regarding course registration should be collected. It focused on collecting data for university requirements that students should be followed before they register the course for next semester. Below are the details about data gathering:

a) Login authentication
b) Subject taken
c) Pre requisite subjects
d) Year taken the subject
e) Data redundancy

Using survey as the main approach of data gathering technique, it is important in order to the needs of system features before developing the system prototype. The survey consists of five (5) multiple choice questions and it is easy to be answered by them. All the questions are basically referring to the current online course registration as the new system developed is an alternative system that students will use in the future instead of viewing the course registration page via online application. The survey is done among 51 UTP students and the results are as below:

Question 1

1. How often do you login to course registration via online? Create Chart Download

	Response Percent	Response Count
Everyday	5.9%	3
1-3 times a week	2.0%	1
Once a month	9.8%	5
Once every new semester begin	82.4%	42
answered question		51
skipped question		0

The above question is to know the important of course registration process and the frequency level of student login into the current online course registration. Based on the result, most of the students tend to use the online website only once during course registration period. Therefore, the frequency level shows that students are lack of interest about the page developed.

Question 2

2. Did you satistified with current online registration course service? Create Chart Download

	Response Percent	Response Count
Yes	27.5%	14
No	72.5%	37
answered question		51
skipped question		0

The question is about students' willingness on the implementation of course registration via GSM mobile phone. Due to the lower income as the student, the project is basically developed for any ordinary mobile phone instead of using smart phone for testing. Developing a system for mobile phone is more preferable as not all of the students are capable to buy smart phone due to its price and more expensive rather than ordinary phone.

Question 5

5. What do you think the best authentication which can be used in course registration via mobile phone for security purpose?

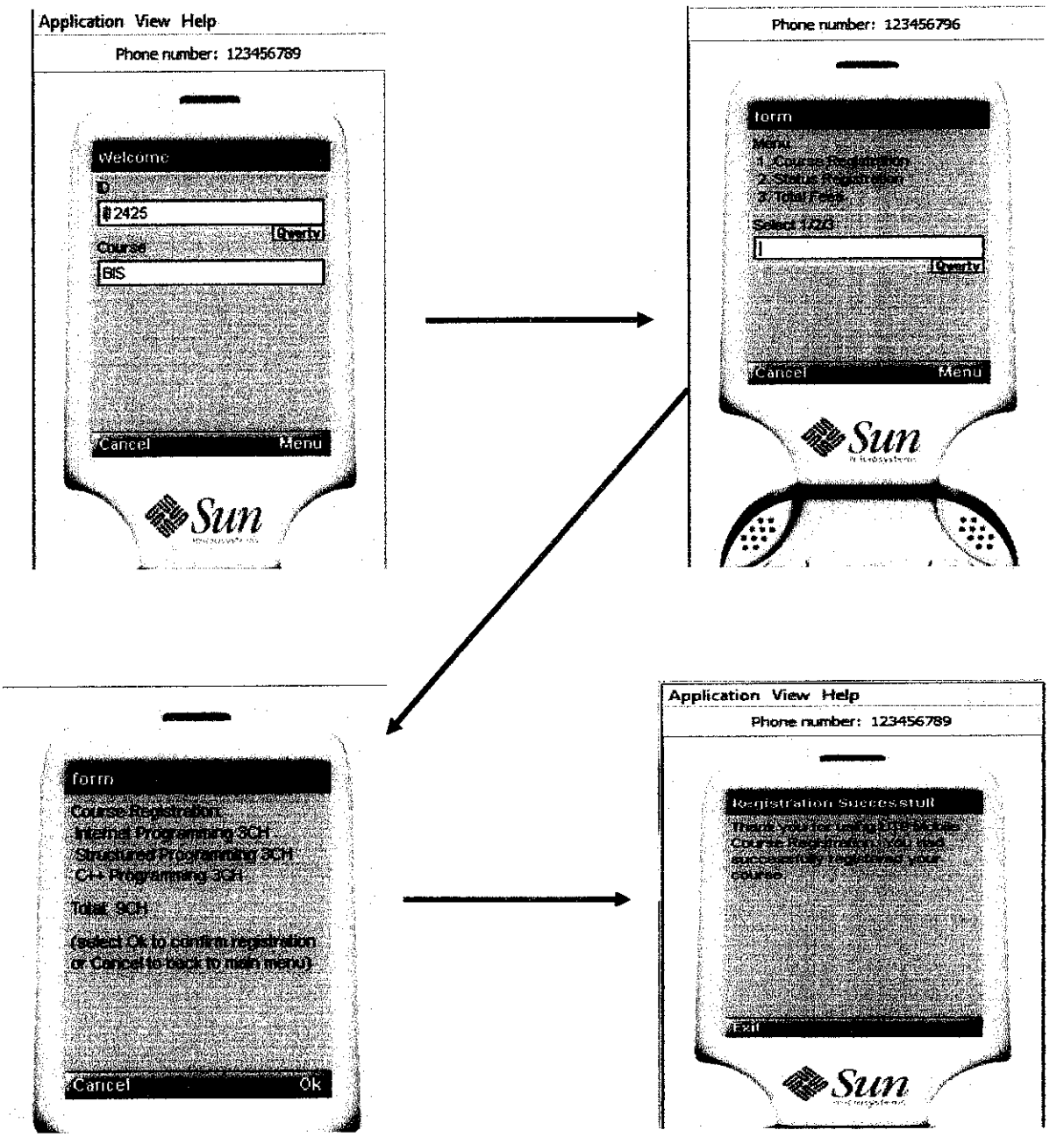
Create Chart Download

	Response Percent	Response Count
SMS One Time Password	70.6%	36
Mobile Signature	21.6%	11
Smart Card	2.0%	1
Additional Phone Token	5.9%	3
answered question		51
skipped question		0

Last question is about applying types of login approaches so that it will be more users friendly and safe. The result shows that SMS One Time Password is more preferable rather than other options. After doing some research on literature, it shows that SMS One Time Password is securing than other authentication in terms of safety purpose. It is because only the person that has successfully login will get the PIN code to view the page.

4.2 Prototype

This project consists of interfaces for ID login designed using PHP language which later will be adapted into GSM mobile phone and retrieving students' details from database created. The prototype interfaces are as below:



System architecture

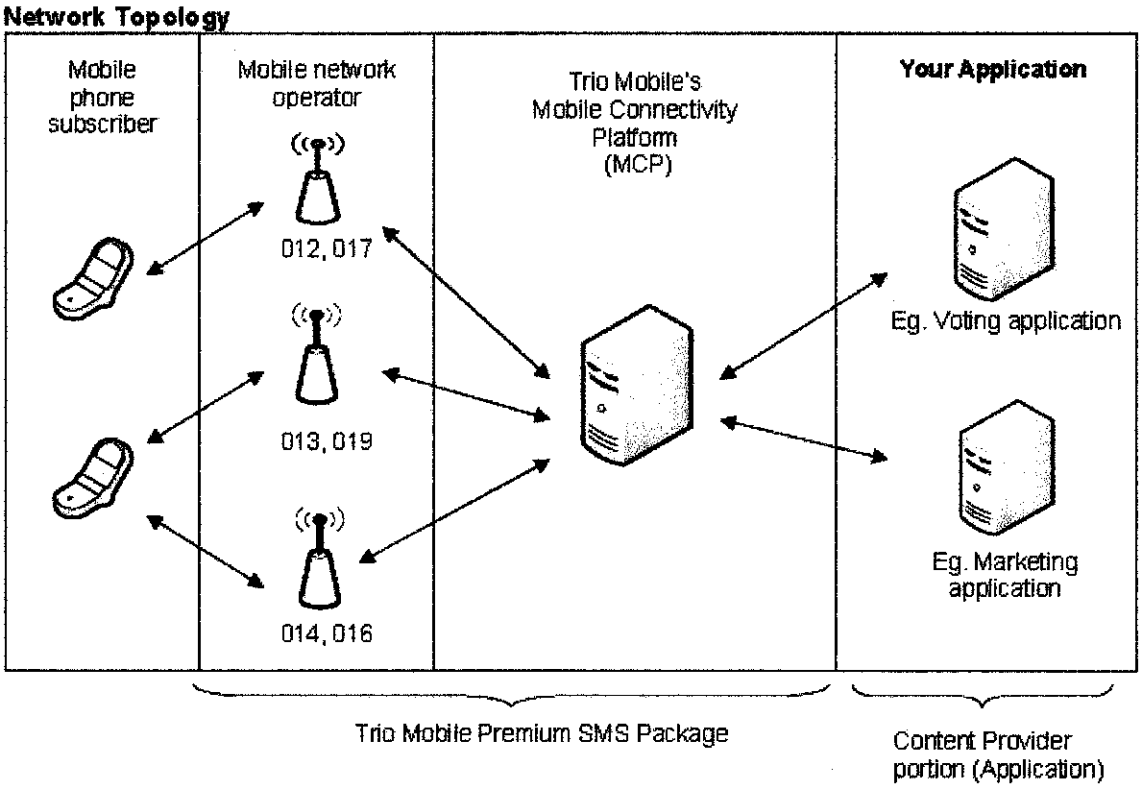
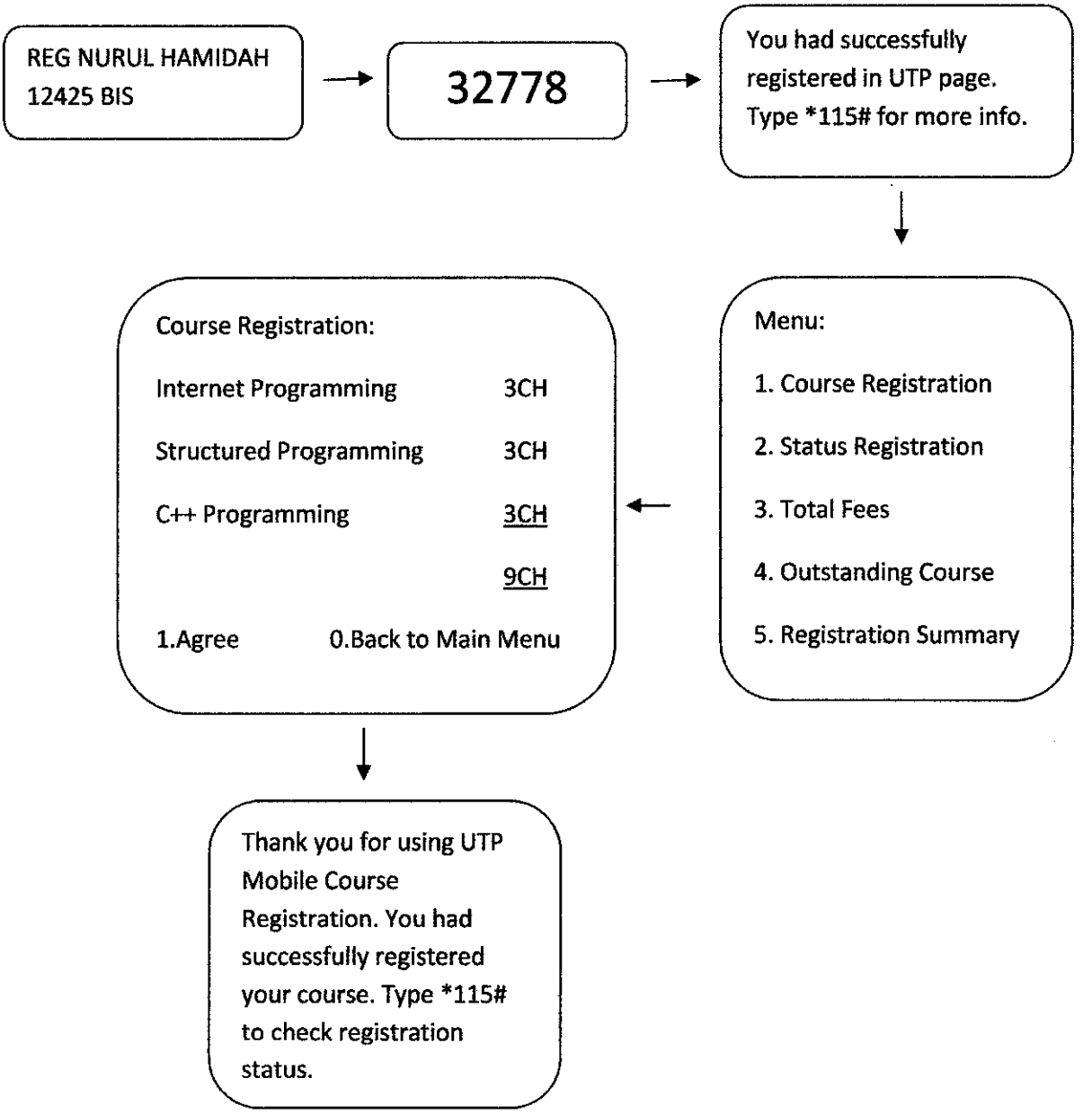


Diagram 1. Network Topology

Below are the typical flows of data when subscribers send information to Content Provider.
1. Subscriber will type a particular keyword and send to a short code.
2. Operator will forward the message to MCP.
3. MCP will route the message to content provider based on the keyword enter by subscriber.
4. Content provider will process the particular message and generate an appropriate reply for subscriber.
5. Content provider will invoke MCP to deliver the message back to subscriber
6. MCP will forward the message to the respective Operator for delivery
7. Operator deliver SMS to subscriber
8. Subscriber receive return message

Project background



Database records:

ID	Name	Programme	Year
i12425	**Nurul Hamidah**	**BIS**	**Final Year**
e12345	**Nur Laili Nadia**	**EE**	**First Year**
p11137	**Kamilah Ramli**	**PE**	**Final Year**
i11345	**Aznin Kamari**	**ICT**	**Final Year**

(Admin View) Below is the list of course registered:

Programme	Course Name	Credit Hour
BIS	Internet Programming,Business Accounting	3
EE	Electronic Management, Circuit Theory, Engineers in Society,Solid and Hazadeous Management	3
PE	Fluid Mechanics,ME Thermodynamics,Engineers in Society,Reservoir Rock and Fluid Properties	4

The list of course available is only available for administrator (registrar department) to view because it is 100% control by the admin. The list will keep on changing as if there is any changes happen on the course offered according to the semester taken.

4.3 Experimentation

- **First prototype design**

  Based on RAD prototyping, design phase is used to develop the system prototype and first prototype design was developed using PHP language. It is because before implement the system into GSM mobile phone, a complete interface should be developed. The prototype consists of login interface with a failure alert in case the user was unable to login (see Figure 4). The login interface then will be linked to the database to retrieve the information according to the ID registered.

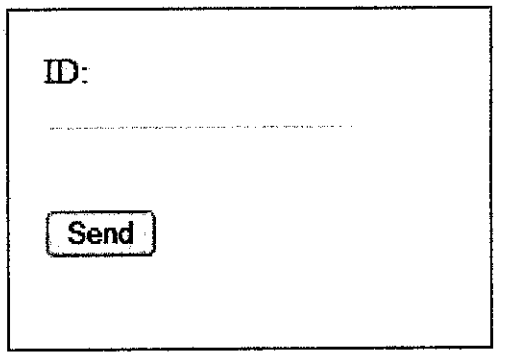


Figure 6 First Prototype

- **How it works?**

  Students will login the page using their student ID and once they have successfully login, the database will match ID with the record and display the subject available for them based on program and year taken.

- **Database connection**

  The database was created using MySQL in XAMPP because it is more compatible with PHP programming. Connection with the localhost is necessary to make sure that the data can be successfully retrieve from database and display the details once students login to the page. Before build database connection, XAMPP needs to be installed to connect to the localhost. Once it is successfully installed, it requires username and password to login to phpAdmin and creating the database.

4.4 Sample of PHP code

```
if($row= mysql_fetch_array($result)){
echo "<table border='1'>";
echo "<tr>";
echo "<th>ID</th>";
echo "<th>Name</th>";
echo "<th>Programme</th>";
echo "<th>Year</th>";
echo "</tr>";
  echo "<tr>";
  echo "<td>";
echo "".$row['ID'];
echo "</td>";
echo "<td>";
echo "".$row['Name'];
echo "</td>";echo "<td>";
echo "".$row['Programme'];
echo "</td>";echo "<td>";
echo "".$row['Year'];
echo "</td>";

  echo "</tr>";
echo "</table>";
  }else{
echo "<br />";
echo "Your ID is not in the database!Please type 'COURSEREG' > student ID > and send to 36828 to register";

}
```

ID	Name	Programme	Year
p11137	Kamilah Ramli	PE	Final Year

PE

- **MySQL connection code**

Username

Password

```
<?php
mysql_connect("localhost", "root", "wajik7230") or die(mysql_error());
echo "Connected to MySQL (Admin Point of View)<br />";
mysql_select_db("Details") or die(mysql_error());
echo "Student details:";
echo "<br />";

// Retrieve all the data from the "student" table
$result = mysql_query("SELECT * FROM student")
or die(mysql_error());

?>
```

- **Close database connection**

```
$con = mysql_connect("localhost","root","wajik7230");
if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }

mysql_select_db("Details") or die(mysql_error());
```

```
mysql_close($con);

?>
```

Close the connection once retrieve data to avoid slow connection

Chapter 5

Conclusion and Recommendations

Conclusions

Based on the above design, it shows that course registration through GSM mobile phone is not an impossible thing to be executed. Using so many programming languages available, this system can be developed easily even without using expertise effort. However, connecting to SMS gateway requires expensive costs and a wise decision needs to be done as it involves lots of money to launch the system.

Recommendations

System improvement

This project is mainly about applying mobile marketing to capture the information regarding course registration for next semester. Some of improvement that needs to be done is through the system architecture such as tools needed in completing the development process. For example, developing the database with large data of students details. Accurate data should be captured in order to avoid data redundancy such as same login ID for some students through manual data collection. For instances, each batch of new students registration should fill up the form of their personal details and program taken.

Purchasing Live Server

UTP should have their own server in monitoring the database and store the information for students. For Final Year Project II it is expensive for an individual to purchase the server rather than UTP itself buy the server it will be less expensive. Therefore, it is highly recommended for UTP to purchase the server.

References

1. (Automated Student's Course Registration using Computer Telephony-System,M.Fahmy,*The International Arab Journal of Information System*, 2002)

2. (Lumsden, J., & Gammell, A. (2004). Mobile note taking: Investigating the efficacy of mobile text entry. *Mobile Human-Computer Interaction*, Glasgow, UK. , *3160* 156-168).

3. (Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research*,*9*(2), 204-215).

4. http://www.idi.ntnu.no/~krogstie/21-MOBIS-NielsenHerstadMOBISFinal.pdf

5. http://www.cs.brown.edu/courses/cs190/old.dhl2003/asgns/2-7/tmp/eboroson_specs.pdf

6. (*How to Build an SMS Service*, Brian Retford,O'Reilly Media,2007)

7. http://www8.cs.umu.se/kurser/5DV012/CRS.html

8. Kotler, P. *"Marketing Management"*, Pearson Education, Upper Saddle River, New Jersey, 2003.

9. Manninen, J-P. 2004. SmartRotuaari jatkuu kännykkämainonnalla / *SmartRotuaari continues with mobile phone advertising*, Kaleva, 17.8.2004, 11

Premium Service Order Form

Company Information

Company Name : Universiti Teknologi Petronas
Office Contact No : 05-3687493
Office Fax No :
Company website : mhilmi_hasan@petronas.com.my

Contact Information

Contact person (commercial matters)
Name : Nurul Hamidah Ab Salam
Designation : Student
Office No : -
Mobile No : 012-2568485
Email Address : sumbuddy89@gmail.com

Contact person (technical matters)
Name : Mohd Hilmi Bin Hasan
Designation : Advisor for Final Year Project
Office No : 05-3687493
Mobile No : 012-2568485
Email Address : mhilmi_hasan@petronas.com.my

Contact person (customer support)
Name : Nurul Hamidah Ab Salam
Designation : Student
Telephone No :
Mobile No : 012-2568485
Email Address : sumbuddy89@gmail.com

Service Information

Share shortcode : 36828

Keyword(s)	Service Type (IOD / Subscription)	Price charge per SMS	Service description (description what service you intend to provide)
Login	ON LOG <name><matric ID><Programme>	RM0.50	Students need to register for first time use
Course Reg	REG<Subject><course code><cedit hour>	RM0.20	Allow students to register course for upcoming semester
FAQ	FAQ<type problems>	RM0.10	Receive feedback and response from students regarding course registration problems

Note :
IOD = Information on demand (1 sms from mobile phone and 1 sms send back to mobile phone)
Subscription – 1 sms from mobile phone to subscribe. Multiple SMS send to mobile phone until 1 sms from mobile phone to stop

For DiGi and Celcom mobile number, when you send the SMS back to the mobile user, please append the price in front of the SMS. For example, if you charge 30 cents, the format is RM0.30: xxx
xxx = content

Agreement for Trio Mobile - Mobile Connectivity Platform (MCP) Service

This Agreement is made this 1st day of July, 2011 between

TRIO MOBILE SDN BHD (671982-W), a company incorporated in Malaysia and having its registered office at 31, Jalan Utama 2/18, Taman Perindustrian Puchong Utama, 47100 Puchong, Selangor Darul Ehsan, Malaysia (hereinafter referred as "**Trio Mobile**")

and

Nurul Hamidah Ab Salam (890429-01-5828), a resident residing in Malaysia and having its residential address at No 31 Kg Limau Manis, Sg Merab 43000 Kajang, Selangor (hereinafter referred as "**Content Provider**")

Trio Mobile and Content Provider shall collectively be referred to as "Parties" and individually as "Party"

Trio Mobile will allow Content Provider to access to MCP services in accordance to the terms and conditions stated herein, provided that Content Provider fulfills its obligations hereunder.

1. Content Provider Responsibility

Content provider agrees and undertakes to:-

1.1 in any marketing campaign carried out by content provider, content provider required:
- 1.1.1 To disclose all information relevance to use of the service including the nature of the content and the charges applied.
- 1.1.2 Not to provide misleading information.
- 1.1.3 Not to provide information that is offensive on moral, religious, communal or political grounds.
- 1.1.4 To display the name and contact number of the content provider.

1.2 Be responsible that no mass marketing of services is made by SMS to any end-users unless there is a prior approval by end-users.

1.3 Ensure that Content Provider is contactable during office hours to end-users.

1.4 Indemnify Trio Mobile and hold Trio Mobile harmless from and against any and all claims, actions, proceedings, damages, liabilities, costs (including reasonable legal costs and expenses), expenses, losses, including consequential losses incurred or suffered by Trio Mobile that may be caused by or arise, whether directly or indirectly from the content provided by Content Provider and/or any breach of this Agreement by Content Provider.

1.5 Be Responsible not to use MCP service:
- 1.5.1 To send unsolicited or unwelcome messages;
- 1.5.2 For any purpose which is against public interest, public order or national harmony;
- 1.5.3 To publish defamatory, obscene or other unlawful material;
- 1.5.4 In any manner which may infringe the copyright, patent, trademark, trade secret or other proprietary rights of any third party or rights of privacy.

1.6 Keep secure any identification, password and other confidential information relating to your account and shall notify us immediately of any known or suspected unauthorized use of your account or breach of security, including loss, theft or unauthorized disclosure of your password or other security information.

2. Intellectual Property

2.1 Trio Mobile will retain all rights and title to the MCP services and any of its trademarks, trade names, names, brands, logos, symbols and other proprietary designations and no transfer of rights is made under this Agreement. Content provider does not have the rights to use Trio Mobile's trademark, trade name or any intellectual property rights whatsoever.

2.2 Content Provider will retain all rights and title to the content and any of its trademarks, trade names, names, brands, logos, symbols and other proprietary designations and no transfer of rights is made under this Agreement. Trio Mobile does not have the right to use Content Provider's content, trademark, trade name, or any intellectual property rights whatsoever.

3. Prices and Fees

Please refer to Appendix 1

4. Charges and Payments

4.1 In event MCP has no access to operator billing system, no transaction will be made. Trio Mobile shall have no liability for any damages caused by such non-availability.

4.2 Content Provider is aware that in case there is no access to Operator billing system, no transaction will be made.

4.3 Content Provider is aware that Operators disclaim their payment liability for transactions that the Operator has failed to collect from end-user. In such event, Trio Mobile shall have no payment obligation towards Content Provider and no transaction fee will be payable.

4.4 MCP does not support chargebacks (refund) to end-user via operator once deduction/payment has been made.

4.5 Content Provider agree to bear their own legal and other costs incurred in relation to the preparation, negotiation and execution of this Agreement and all documents contemplated by it (except where this Agreement or those other documents expressly provides to the contrary). The stamp duty including penalty charges (if any) in respect of this Agreement shall be borne by Content Provider.

4.6 Within twenty (20) working days from the first day of each calendar month, Trio Mobile shall provide Content Provider a report showing the total number of transactions made under Content Provider service for the previous month provided Trio Mobile received the report from Operator.

4.7 Computation of the revenue due to the Content Provider shall be based solely on the transactions detailed in Trio Mobile's report.

4.8 Payment shall be made from Trio Mobile to Content Provider within three (3) days from the date of payment request provided Trio Mobile has received payment from Operator.

4.9 Payment from Operator will take on average 60 to 90 days from the end of each month. Trio Mobile will not be liable for payment delays caused by Operator.

5. Confidentially

5.1 Each party shall keep all information confidential and shall not without the prior consent in writing of the disclosing Party copy or disclose to any third party information or any contents of any documents.

5.2 Each party acknowledge and agree that all confidential information disclosed by or on behalf of the party disclosing such information shall be and remain the property of the Disclosing party.

5.3 The foregoing obligations shall not apply to any information which:

5.3.1 was already in the public domain or becomes so through no fault of the Receiving Party;

5.3.2 was known to the receiving party prior to disclosure by the disclosing party as proven by the written records of the receiving party.

6. System Upgrade

6.1 Trio Mobile and operators have the right to perform maintenance and upgrade of MCP and their respective services. Content Provider has no right to claim any compensation whatsoever for such interruption.

7. FORCE MAJEURE

7.1 Trio Mobile shall not be liable for any breach of this Agreement caused by Acts of God, insurrection of civil disorder, war, or military operations, national or local emergency, acts or omissions of Government, highway authorities or other competent authority, industrial disputes of any kind, fire, lightning, explosion, flood, subsidence, inclement weather, acts or omissions of persons or bodies which are outside of Trio Mobile reasonable control.

8. Suspension of Service

8.1 If Content Provider does not comply with the terms in this Agreement, Trio Mobile reserves the right to suspend the provision of MCP services or any part thereof immediately without any liability or obligation to Trio Mobile.

8.2 Each Operator has the right to demand Trio Mobile to immediately disconnect any Content from access to MCP without case or explanation. If Operator has made such demand, Trio Mobile will inform Content Provider immediately related to such disconnection and Trio Mobile will disconnection such content without any liability or obligation.

8.3 If Content Provider shall rectify such default to the satisfaction of Trio Mobile, the MCP Services or any part thereof shall be reinstated.

8.4 If Content Provider does not comply with the SMS subscription guideline provided and has cause suspension of Trio Mobile shortcode, a penalty charges will be imposed for the first time. On the second time, Content Provider service will be permanently terminated without any liability or obligation to Trio Mobile

9. Termination

9.1 Either party may terminate this Agreement immediately upon written notice if the other party should become bankrupt or enter into liquidation proceedings.

9.2 If this Agreement is terminated, each Party is obliged to return to the other Party all confidential or technical information and material originally supplied by that Party.

10. Amendment

10.1 Trio Mobile shall have the rights to review the Fees, Charges and the Revenue Apportionment at any time by giving seven (7) days notice in advance.

10.2 Any variation, amendment, addition or deletion of any of the terms and conditions of this Agreement is only valid if made by Trio Mobile in any form of writing.

11. Limitation of Liability

11.1 Trio Mobile will not be liable for any loss or damage arising from loss of business, revenue or profits, anticipated savings or wasted expense, corruption, destruction or loss of data or video, costs of substitute services of any nature whatsoever, breach of privacy or security of communication or for any indirect, special or consequential loss whatever including those arising from or occasioned by; including but not limited to failure of electronic or mechanical equipment or communication lines, telephone or other interconnect problems, computer viruses, "hacking", theft, operator errors, unauthorized access, any malfunction or defect in the MCP services or environmental conditions.

12. Special Circumstances

12.1 Overdue Debts and Judgments. Under certain circumstances, the law allows Trio Mobile to use the money from any account in Content Provider name or that Content Provider jointly own with another parties to pay any amount Content Provider owe to Trio Mobile. This is called the "Right of Setoff." Trio Mobile is not required to give advance notice of our intent to take such action; if Trio Mobile does take such action, Trio Mobile will notify Content Provider afterwards.

12.2 Accounts of Deceased Content Provider (registered as individual). Upon notification of the death of Content Provider (individual), certain documents must be presented to Trio Mobile before funds in the Account can be paid out and the Account closed.

13. Duration of Agreement

13.1 The term of this Agreement shall be for twelve months after the Effective Date of this Agreement. Thereafter, this Agreement shall automatically renew for twelve month periods unless terminated by Trio Mobile. This Agreement may be terminated immediately by either party upon notification to the other in writing extension and subject to such fees as may be mutually agreed between the Parties.

[The remainder of this page is intentionally left blank]

Appendix 1

Operator Fees and Charges are valid until further notice. Trio Mobile reserves the rights to make changes to the operator fees and charges provided Operator has imposed changes on fee and charges. Trio Mobile will inform Content Provider in writing 1 (one) week prior to changes.

Content Provider shall pay Trio Mobile RM10.00 (or such other rates as Trio Mobile may determine from time to time) for every complaint and / or query arising from or in connection with the Content Provider Services received by Operator from Subscriber. For the avoidance of doubt, any recurring complaint and/or enquiry in relation to the same Content Provider Services transaction shall be treated as a separate complaint and/or enquiry.

Connection Fee

Content Provider undertakes to pay Trio Mobile:

First Year	: RM 100.00 for 1st Keyword
Subsequent Year	: RM 1,000.00 for 1st Keyword
Setup Fee	: Nil
Month Access Fee	: Nil
Profit sharing after Telco deduction	: 85% - Content Provider, 15% - Trio Mobile

Additional Keyword

Subsequent keywords (Bulk Purchase)	Price per keyword (same feature as Premium SMS above)	Total Amount
1	RM 800	RM 800
3	RM 700	RM 2,100
5	RM 600	RM 3,000
10	RM 500	RM 5,000

Operator Fee and Charges

Below are the percentage revenue share kept by the respective Operators per message and these percentage are subject to change by the respective Operators

Operator	Premium SMS	Subsequent MT in one message
Maxis	42%	RM 0.10
Celcom	53%	RM 0.00
DiGi	40% + RM 0.07	RM 0.07

Administration Disbursement Fee

For each disbursement amount, administration fee of RM15.00 will be imposed

Other charges

Each change of existing live keyword	: RM 500
Suspension of shortcode penalty	: RM2,000 (refer to Section 8.4)

Content Provider Details

Contact Details

Name	: Nurul Hamidah Ab Salam
IC No	: 890429-01-5828
Address	: No 31, Kg Limau Manis Sg Merab 43000 Kajang Selangor
Office / Contact No	: -
Mobile No	: 012-2568485
Fax	: -
Email	: sumbuddy89@gmail.com

Bank Account Information

Name of Bank	: Maybank
Branch Address (in full)	: Batu Gajah Perak
Account Name (Individual)	: Nurul Hamidah Ab Salam
Account Number	: 166010095079