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THE DEVELOPMENT OF DRIVING SCHOOL WEB-BASED SYSTEM WITH APPOINTMENT NOTIFICATION VIA SMS

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APPROVAL

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Approved By:
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December 2007

DECLARATION

I certify that this thesis and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline

DECEMBER 3, 2007 ……

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ABSTRACT

"Driving School Notification System via SMS" is developed to reduce and ease current appointment notification difficulties in driving school system. Currently, student, instructor and the driving school communicate with one another via their respective handheld devices or face-to-face meet up to set their driving class appointment schedule. Other than that, instructor is not dealing with only one student but more. It can cause them difficulties in remembering all the schedule being set. To add to that problem, the appointment might change as needed according to the availability of both parties. These changes might possibly cause either side forgetting the appointment being set. With this system, Short Messaging System(SMS) is the method being use to set an appointment between the instructor and their student. SMS will be sent to list availability of the instructor and confirm the appointment. The instructor and student will be able to check their respective schedule from the SMS. SMS will also be sent to both parties reminding them about the appointment 1 or 2 days before. The use of SMS and the web-based system enable the driving school to record their employee appointment schedule properly. The resource for the developed system is collected from interviews, books, internet and previous related project being done. Developing the system required in depth studies in setting up SMS server and developing the web-base system. This is essential in enabling the communication between the driving school database and the student and instructor mobile devices. It is concluded that this system provided the decent solution for the current problem occur in the driving school system.

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CHAPTER 1

INTRODUCTION

1.1 Background

Typically, ones with an intention to drive any motor vehicles namely car, motorcycle or lorry needs to have a driving license that permits them to do so. Applying a license require a person to register themselves at any respective driving school. Then they will need to attend 2 lecture classes which are Kursus Pendidikan Pemandu(KPP) and Kursus Asas(KA). They will need to sit for an online UJIAN UNDANG-UNDANG which the test is base on what being taught in the KPP. Then they will be able to learn to drive through its practical driving class which requires the student to attend it for minimum 8 hours. The hours they need to complete the class had been set by the Department of Road Transportation (JPJ). Once completing at least 8 hours of driving class, they will be able to sit for UJIAN MEMANDU which decides whether they will be granted with a driving license or not. If not they will need to re-sit for the test. However, ones need to bear in mind that there are certain age limit for particular motor vehicles. For an example, a person need to be 18 years old or above to allow them applying for car driving license. To add to the complexity in gaining driving license is the problems exist in the current driving school system. Therefore, the "Driving School Notification System via SMS" is developed to ease these problems.

1.2 Problem Statement

Currently, driving school manually record an appointment between its instructor and their students by using a log book. On the student and instructor side, if there is a change of schedule, they might communicate with one another

through phone call, SMS or meeting each other face to face. Setting an appointment involves negotiating between both parties and using SMS can be so effective or burdensome sometime. It depends on how the SMS technology is use. Normal SMS might tend to get dangling for some time without reaching the final decision on when to set the appointment. However with proper customs design of the SMS access interface and menu, using SMS can be so effective in setting appointment schedule.

Other than that, instructor teaches not only one student but more than that which reflect the reality of how many appointment need to be attend by the instructor. For the student side, attending driving class appointment is only one of their long list daily schedules. Therefore, there is a possibility of either the instructor or the student forgets about their appointment schedule. Things is worsen when sometimes, there might be a change of schedule needed as either parties might have problem turn up for the appointment that being set initially due to other commitment.

The driving class appointment is set solely base on understanding and availability for both parties to attend it. There is no intervention by the driving school to set the appointment on behalf of their employee, the instructor and their customer, the student. Therefore, there might be a possibilities that either the student or instructor breaching the law by not attending the required minimum 8 hours class.

1.3 Objective

i. To develop a driving school notification system that implement web-based and Short Message Service (SMS) technology to display related information, set appointment and trigger a reminder.
ii. To setting up and configure a web-based system, a GSM mobile phone and a SMS server to be used for the developed project.

iii. To integrate between the web-based system, mobile device, and the SMS server through a logical link that enable communication among the 3 components.

1.4 Scope

i. The developed project focus on a technological requirement that related to the web-based system, mobile device and the SMS sever.
ii. The developed project manipulates the related information regarding the driving school.
iii. The developed project can be used by the driving school, the instructor and its students.

1.5 Significance of the Project

i. The developed project saves both party, the instructor and the student time as most of the business is done through SMS.
ii. Avoid the instructor and the student from missing out on their driving class appointment.
iii. Provide the capabilities to trace the information regarding the driving class appointment.
iv. Provide efficient and effective solution using SMS compare to the conventional driving school system.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Nowadays, people communicate with each other using various ways. One of the popular current trends of communicating is through SMS. This technology is by default provided in a mobile phone. Beside SMS, one of the other popular method of communication is through the World Wide Web(WWW), which is one of the powerful capabilities of internet. Reflecting on popularity of these 2 communications methods, this project is proposed which implement both method technologies to the full extend.

2.2 Technology

Developing the proposed system required some of technologies as stated below:

2.2.1 Short Messaging Service (SMS)

"SMS is a technology that enables the sending and receiving of message between mobile phones" (What is SMS (Short Message Service)?). SMS capable of sending messages of up to 160 characters (224 characters if using a 5-bit mode) to mobile phone that uses Global System for Mobile (GSM) communications (Simon Smith). "GSM on the other side is a digital mobile telephony system that is widely used in Europe an other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies (TDMA, GSM and CDMA)" (GSM).

As the developed project involves alert and notification service to the driving school students and its instructor, SMS is the suitable method to be used. The reason for that is mobile phone is a device that is being carried by its owner most of the time and almost everywhere they go (Alerts and Notifications). Therefore, it has higher reachability rate compare to other communication method. The students can check the SMS contents immediately once it is received. Other than that, "SMS technology allows the "push" of information. This is different from the "pull" model where a device has to poll the server regularly in order to check whether there is any new information. The "pull" model is less suitable for alert and notification applications, since it wastes bandwidth and increases server load" (Alerts and Notifications).

SMS center (SMSC) is responsible for handling the SMS operations of a wireless network. SMSC will receive SMS sent from a mobile phone and forward it towards the destination. Main duty of SMSC is to route SMS and regulate the process. For instance if the recipient is unavailable, the SMS will be stored in SMSC and at a later time when the recipient is available, the SMS will be forwarded again. Normally SMSC is set to dedicatedly handle the SMS traffic of one wireless network. (What is an SMS Center / SMSC?)

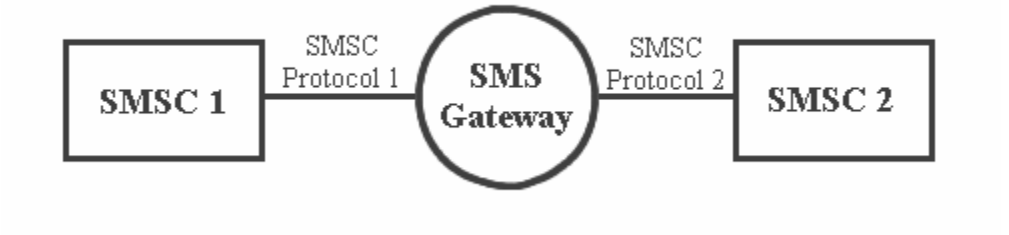

Figure 2.1 . An SMS gateway acts as a relay between two SMS centers

SMS gateway is placed between the 2 SMSCs and act as a relay between the two SMSC. The reason for this is the problem exists in SMS messaging where SMSC used by different company are proprietary and implement their own communication protocol. Therefore, two SMSCs cannot be connected if they do not support the common protocol. Here comes the role of SMS gateway which is to translate one SMSC protocol to another one. This makes it possible for two different wireless carriers to interconnect their SMSCs for example the exchange of inter-operator SMS. (What is an SMS Gateway?)

2.2.2 PHP

PHP is a acronym for PHP : Hypertext Preprocessor. PHP is an open source, server-side and HTML embedded scripting language used to create dynamic Web pages. Moreover, PHP script syntax has similarities to that of Perl or C. Within HTML document, PHP script is enclosed with special PHP tags that enable the author to jump between HTML and PHP. PHP was created sometime in 1994 by Rasmus Lerdorf. (PHP)

PHP is commonly use to extract data out of a database and present it on the web page. It is said that PHP is widely used with the mSQL database. PHP was originally known as “Personal Home Page”.(PHP)

2.2.3 MySQL

MySQL is a relational database management system (RDBMS) based on SQL (Structured Query Language). It was first released in January 1998 and is now one component of parent company MySQL AB’s product line of database servers and development tools.

Many internet startups became interested in the original open source version of MySQL as an altenative to the proprietary database systems from

Oracle, IBM and Informix. MySQL is currently available under two different licensing agreements which is the free of charge, under the GNU General Public License (GPL) open source system or through subscription to MySQL Network for business applications according to (P. Eng and Rob McCormack).

2.2.4 Activexperts SMS Messaging Server

"SMS Messaging Server is an SMS messaging framework that enables companies to send, receive and process SMS- and e-mail messages. SMS Messaging Server runs as a background service on any Windows server (Vista/2003/2000/NT) platform. It also runs on Windows XP." (ActiveXperts SMS Messaging Server - Product Overview)

"The Message Database and the Configuration Database play a central role in the SMS Messaging Server. The Configuration Database contains all configuration parameters, like communication devices, scripts, general settings, etc. Can be any OLE/DB compliant database, like MS Access, MS SQL and MySQL (default: MS Access). The Message Database contains all incoming and outgoing messages. Can be any OLE/DB compliant database, like MS Access, MS SQL and MySQL (default: MS Access)". (SMS Messaging Server Design)

2.2.5 Online system

Generally, something is said to be online if it is connected to some larger network or system .In other words, the larger network usually refer the Internet. Therefore, 'online' describes the information that is accessible through the Internet. "oNLine System" or NLS was a revolutionary computer collaboration system invented by Doughlas Engelbart and other researches at the Augmentation Research Center (ARC) at the Stanford Research Institute(SRI) during the 1960s. The NLS system was the first to employ the practical use of hypertext links, the mouse, raster-scan video monitors, information organized by relevance, screen

windowing, computer presentation and other modern computing concepts. (NLS(Computer System)).

2.3 Similarities of Studies

2.3.1 Use of text messaging in the aftercare of patients with bulimia nervosa

The research is done by S. Bauer, R Percevic, E. Okon, R. Meermann and H. Kordy from Center for Psychotherapy Research and Psychosomatische Fachklinik Bad Pyrmont, Germany (2003). The project is about SMS intervention for the aftercare treatment of bulimia nervosa. The programme is offered to discharge bulimic patients for 6 month. The programme consist of weekly messages from patients regarding their bulimic symptomatology and corresponding weekly response that contain a mixture of pre-programmed parts and individually tailored information.

The system is similar to the propose system as it use SMS to works. However the system is use for medical field whereas the proposed system is using in transportation.

2.3.2 Performance evaluation of an sms-based e-mail and voicemail notification architechture

The project done by K. Koumpis, S. Cvetkovic and G. Peersman from Department of Computer Science, The University of Sheffield, Sheffield UK. The research is about the performance of notification services based on low bandwidth messaging provided by the GSM SMS. The focus is on the evaluation of email submission to SMS. The elements being evaluate is the message length, device drivers and protocols. The research also looks into the cause of bottlenecks and discusses the effectiveness of the SMS gateway architecture. The research found

that the gateway presents a stable performance over the various types and size of incoming messages.

The similarities of the study are that it setup SMS system in order to evaluate the SMS performance. The approach they use to setup SMS gateway for example can be use as a reference for setting up this project SMS system.

2.3.3 GPRS-based WLAN authentication and auto-configuration

The research done by Phone Lin, Yi-Bing Lin, Vincent Feng and Yen-Cheng Lai from department of Computer Science and Information Engineering, National Chiao Tung University in Taiwan (2003). This paper proposes setup mechanism for wireless LAN (WLAN) which is its authentication and auto-configuration that based on SMS technology of mobile telecommunications network. Their method is by automating the WLAN authentication and configuration setup procedure without involving the users.

The similarity is the use of SMS technology that involve the use of SMS gateway.

2.3.4 SMS-based discussions-technology enhanced collaboration for a literature course

The project by H. Bollen, L. Eimler, S. Ulrich Hoppe from institute for Computer Science & interactive System, University of Duisberg, Germany (2004). The paper present a communication and discussion toolkit that based on SMS which designed for use in schools. PDAs is use in a wireless network to create an environment which emulates the sending of SMS with mobile phones from the students. The SMS by the students are gathered and stored in a database. It will establish a support or base for later discussion and analysis using the Cool Modes. Cool Modes are discussion system and modeling that based on graph.

2.3.5 Mobile technologies and learning

The project update summary by Jill Attewell (2004). The project try to envisage the potential of mobile devices for learning purposes. The project not only put it focus on developing learning material for handheld devices but also on reluctant young learners with poor literacy or numeracy. m-learning project systems and materials can be access via microportal (mportal) that consists of a series of mini web pages. The project had developed two features that use SMS. It is text messaging quizzes SMS mini language courses.

2.3.6 Online Mobile Interstate Bus Reservation System in Malaysia

A research by W.W. Tan, Y.H. Lee, S. L. Chen and S.C. Tan from Malaysia. In Malaysia, bus reservation system had long been implemented from the manual to computerized system. The researchers try to focus on mobile reservation system in order to assist public in gaining easier and faster way of doing reservation. The information involved is variety and real time type. XML web services are used and it is integrated with the mobile technology.

The research similar to the developed system in term of its architecture. It connects and integrates the mobile-based technology with the web based features which is useful to the development of the proposed system

2.3.7 Agent based system for confirming user Appointment through callback URL push

The research is done by Jung-Jin Yang (2005). The research focuses on building an agent-based system for confirming user appointment through Callback URL. It involves the use of SMS on the mobile phone in order to reduce the failing appointment and the loss from such failures. The research also introduces method to avoid the system from degradation from the excessive

accesses per try. The methods are methods in processing large-scale transactions, preventing obstacles, along with the comparison of the two methods.

The similarity of this research to the proposed system is that it deal with the SMS notification for the purposes of reminding an appointment. Therefore, this research can be used as reference in setting up appointment notification features for the proposed system.

2.3.8 GSM-based mobile tele-monitoring and management system for inter-cities public transportations.

A project by Al-Rousan, M. Al-Ali, A.R. Darwish (2004). This paper produces tele-monitoring and management system for inter-cities transportation vehicles such as taxis, train and busses. The system use stand-alone single-board embedded system that is equipped with GPS and GSM modems that are installed in the vehicle. GSM-server on PC is setup in the transportation's head-quarter that will receive SMS on the vehicle current or real-time parameters. The parameters is for examples are the vehicles speed, location or road condition. Software packaged is developed and installed in the GSM-server to process the incoming SMS. It use ASP and HTML to create the GUI and the software management packaged. The system use readily available GSM mobile public networks.

The similarity of this research is that is implement SMS system. Moreover the research also involves web based system.

2.3.9 Car sharing- an (ITS) application for tomorrows mobility

A project conducted by M.S. Mannan (2001). The research is an IT-based car sharing system called City Car Club (CCC). The CCC involve reservation system that communicates with a vehicles through the GSM SMS messages. Therefore, no call centre is needed for bookings purposes. Member of CCC can

do bookings through internet and choose the time schedule and the location of the vehicle that suit them.

The similarity of the study is the reservation part. The project involved reservation features in bookings car whereas the propose system involve place reservation for a driving class.

2.3.10 Mobile payment solution – Symbiosis between Banks, application service providers and mobile network operators

This project is done by Natali Delic and Ana Vukasinovic (2006). The paper deals with solution to integrate banks, application service providers and mobile network operators in providing end-to-end mobile payment solution to their users. It contains 3 part which are core of mobile payment system, interface to application service providers on one side and the interface to the banks itself. The channel for users to access mobile payment system is through SMS, internet where each application have common, unified interface to the core of the system.

The similarity study is it deals with how to integrate mobile system with other system. The proposed system need to integrate between the web-based system, SMS-based system and mobile devices technologies.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter explains the methodology or step-by-step approaches to be used in developing the project and at the same time satisfying user requirements. The development of the "Driving School Notification System via SMS" project is based on the System Development Life Cycle (SDLC) to achieve the entire objectives in a given period of time.

Figure 3.1 provides an overview of the structure of the research method.

3.2 Phase 1: Project Planning / Preliminary Investigation

This phase requires the researcher to define goals and objectives of the project. All of the objectives being selected must be achieved successfully. Furthermore, this phase also enquires the researcher to do some feasibility study and determine any possible constraints regarding the research topic. The main idea is to give the researcher a brief overview about the project as a whole. In developing the project, time required must be estimated to help the researcher to manage their time or schedule and accomplish the entire task within the time frame being set. The estimate time frame is shown by the Gantt Chart (refer to appendix A). Before the project is developed, any related information will be studied. All the information will be gathered from interviews, readings and reviewing the previous existing systems.

3.2.1 Primary Data

The primary data are derived from interviews that were conduct on the instructor of the driving school. Any related questions will be asked and the response is recorded for the purposes of information gathering in developing the project.

3.2.2 Secondary Data

Secondary data is gathered from readings and reviewing previous project done by other researcher. Readings is done on any related and trusted material let it be from internet or books. Existing or previous project is also reviewed in order to get better view of the requirement for the developed project. It is important in gaining extra information for developing the project.

3.3 Phase 2: Analysis

Once defining the Phase 1 requirement, the next phase is Analysis Phase. This phase required the researcher to study the problem, deficiency or new requirements and specifications for the developed projects in more detail. Besides, the previous or existing project is studied to gain understanding which stand a good stead for providing improvement according to the current situation or problem arise for the use of the developed project. Moreover, hardware and software requirements are identified at this stage and the details are listed as follows.

3.3.1 Hardware Requirements

The hardware requirements are as follows:

a) Notebook with Intel Core 2 Duo 1.8 processor

b) 2 GB of disk space (minimum)

c) 256 MB of RAM (minimum)

d) Sony Erickson K618i

e) SIM card

f) Mobile Phone USB cable

3.3.2 Software Requirements

Besides determining the hardware requirements, the software requirement must also be considered and should not be neglected. The software requirements are as follows:

a) Hypertext Processor (PHP) Script Language version 5.2.1

b) MySQL Database version 5.0.27

c) Apache Web-server version 2.2.7

d) phpMyAdmin Database Manager version 2.9.2

e) Microsoft Windows XP professional service pack 2

e) Activexperts SMS Messaging Server version 4.1

f) Sony Erickson Device 043 USB WMC Modem driver version 4.34

g) MySQL Connector/ODBC version 3.51

3.4 Phase 3: Design

This phase requires the designation of the system based on the requirements needed. Four main elements which are input, processing, files and output is considered. For systems design phase, the physical design will be developed based from the previous phase. Besides, it must meet all the specifications described in the system requirements listed in the systems analysis phase. System design tasks include data design, user interface design, web-based interface design and the system architecture overview for the database, SMS server and the web-based system.