

Mobile Summon System

by

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Dissertation submitted in partial fulfillment of
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June 2006

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CERTIFICATION OF APPROVAL

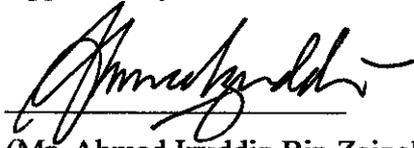
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Mohd Adzlan Bin Omar

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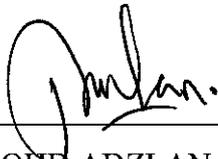
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May 2006

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.



MOHD ADZLAN BIN OMAR

ABSTRACT

This paper is research on the mobile commerce (m-commerce) and WAP-enabled applications that will be used in developing a Mobile Summon System. With the Mobile Summon System, it has capabilities to help users in making payment for summons. Portable mobile devices such as mobile phones were used as a medium in making the transaction. This report started with the introduction of the project which consists of the background study, problem statement and the objective for this project. The current payment for summons was made by using manually and via online services (e-commerce). Thus, the objective of developing Mobile Summon System is to improve the payment system and to make users more convenient in terms of making payment. Then, there is the literature review from journals, books, magazines and internet. The literature review is the major reference in developing this project. The methodologies that have been used during developing the system are waterfall approach as well as decision support system. The waterfall approach consists of five phases which are requirement analysis, system requirements, design, coding and finally testing. Result and discussion describes the interfaces and the output of the system. The final part of this paper is the conclusion and recommendation.

Keywords: Mobile Summon System, m-commerce, e-commerce.

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ABBREVIATIONS

B2C	:	Business-to-Consumers
B2B	:	Business-to Business
CDPD	:	Cellular Digital Packet Data
GPRS	:	General Packet Radio Service
GSM	:	Global System for Mobile communication
IIS	:	Internet Information Services
LAN	:	Local Area Network
MME	:	Microsoft Mobile Explorer
MMIT	:	Microsoft Mobile Internet Toolkit
SMS	:	Short Messaging Service
WAP	:	Wireless Application Protocol
WWW	:	World Wide Web

CHAPTER 1

INTRODUCTION

1.1 Background of Study

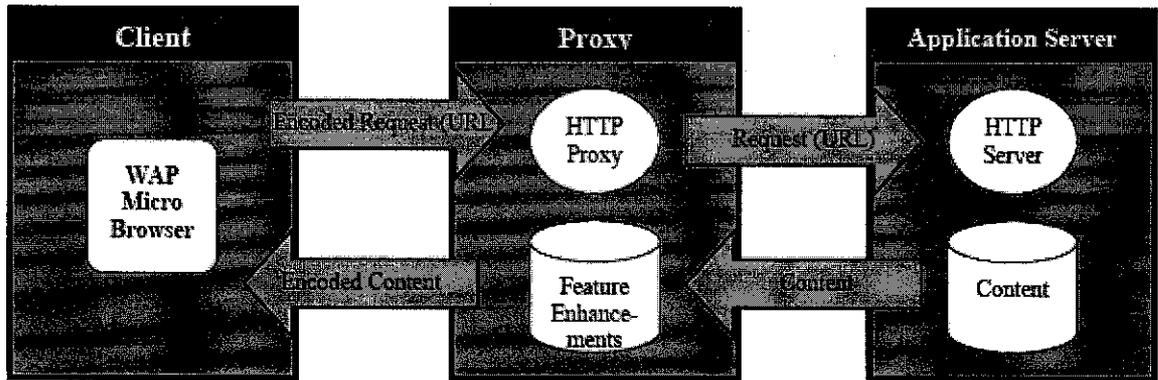
The development of the Internet as a global communications medium has enabled millions of people to share information and conduct business electronically. In more recent years there has been increased demand for mobility – people want access to information resources and services at their demand, irrespective of location. The growing demand for mobility has led to the emergence of WAP (Wireless Application Protocol). WAP is seen as the next step in providing value added services to the current generation of mobile wireless devices. The types of services that WAP is intended to provide include such things as news and information resources, shopping, banking services, weather and traffic alerts, mapping, locater services and directory services. A useful service for a handheld wireless device would be the possibility of retrieving useful information pertinent to a query, allowing a user the flexibility to satisfy personal information requirements.

As mobile devices are becoming more commonplace, driven by recent technological advancements, opportunities are abound for mobile commerce (m-commerce). Through the improvements in computing and communications capabilities, a variety of applications in m-commerce are being developed – some of which are moving from the e-commerce server-side to the m-commerce client side.

M-commerce is a relatively new term that may be described as e-commerce in the wireless web. It involves the conduct of business and services over portable mobile devices such as mobile phones and personal digital assistants (PDAs) and represents a portion of e-commerce transactions, both in the Business to Consumer (B2C) and Business to Business (B2B) area. There are numerous potential m-commerce applications to be developed, some of which include mobile inventory management, product location, proactive service management, mobile auctions, mobile entertainment services and mobile distance education.

M-Summon system is one of m-commerce area which is involved in transaction. Nowadays, the current payment system for summons is via online services (internet) and manually payment requiring users to go to police station. For the online services (internet), the companies that involve are eservices.com.my and rilek.com.my. Those companies had developed web sites which are involve in e-commerce side. Customer can easily pay summon via the online services. In fact, for the m-summon system, user can make payment via mobile or others portable devices.

To deploy M-Summon services based on WAP, usually, a business entity would need to purchase a WAP gateway. The gateway functions to forward a request for a WAP-enabled device to the destination web server together with an indication that it is for a WAP user, as well as to forward the response back from the destination web service to the device. The gateway is publicly available on the Internet and is hosted by content providers where these systems are usually two-in-one servers with the WAP-enabled web server and gateway rolled into one. A typical WAP model with the proxy is shown in Figure 1.1



Source: [8]

Figure 1.1: WAP Model

Cell phones (mobile telephones) have become part of our life style, and new mobile devices like the Palm Pilot, the Pocket PC, and the upcoming Auto PC is about to be added to the list. One exciting thing about these new mobile devices is their ability to connect to the Internet and to execute web applications. Mobile applications can now be developed to deliver any types of data to any user any place in the world. Different mobile devices support different programming languages. Some support WAP and WML, some support HTML or a limited version of HTML, and some support both or a different language. To support all types of mobile devices, developers must create one different application for each language. With .NET Mobile, Microsoft has introduced a new platform for development of mobile applications.

An extension need to develop mobile applications which is, called the Microsoft Mobile Internet Toolkit (MMIT) or simply .NET Mobile. .NET Mobile is an extension to Microsoft ASP.NET and the Microsoft's .NET Framework. .NET mobile is a set of server-side Web Forms Controls to build applications for wireless mobile devices, like web phones and PDAs. These controls produce the different output for different devices by generating WML 1.1, HTML 3.2, or compact HTML.

1.2 Problem Statement

1.2.1 Problem Identification

There are two types of payment for PDRM summon which are via online services (internet) or pay manually at police station. When the online services down, user cannot surf the web site. At the same time, if the internet down user cannot pay summon via online services. This issue would make users face with difficulty in making payment. Nowadays, mobile devices are becoming more commonplace and very famous among people around the world. Almost everyone have mobile (hand phone) because mobile can be uses as a medium to communicate among people around the world. Otherwise, increases in growth development would make people become busy. Based on that statements, people don't have time to pay summon at police station or via online services (internet). This factor had affected to the government and the police traffic because of the delay payments. So, by developing this Mobile Summon system, it would help both party which the PDRM and the users.

1.2.2 Significance of the Project

By developing the M-Summon system, users can solve problem regarding to the payment of summonses. The summon payment can be done by using mobile devices such as hand phone. M-Summon system could avoid from online services down because this Mobile Summon system using WAP as the medium for the transaction. This would make the system more effectively and efficiently.

1.3 Objectives and Scope of Study

1.3.1 Objectives

The objectives of this project are as follows:

- To develop a Mobile Summon system :
 - Can pay summons by using hand phone without going to the police station or pay summon via online services (internet). So, it will make users easier and convenience.
- To improve in payment system.
 - As being practiced, the payment of summon was conducted manually. If there is any problem occur it will affected to the whole process and it will take a time to settle the problem. In order to reduce the possibility of the problem, the whole transaction sections should be integrated and centralized.
- To improved life style
 - By using this system, people can improve their life style by involving in the technology. People also can gain new knowledge about GPRS and learn on how to use hand phone in term of its functionality in details.

1.3.2 Feasibility of the Project within the Scope and Time frame

Developing this system would need some integration of hardware and software. These tools are available and will be used throughout the project. With the tools and sources of information can be found in libraries or by surfing through internet, the project is feasible to be done. Programming tools need to be learned and the hardware components need to be studied and understood. Other than that, some new skills need to learn such as telecommunication skills and business skills.

The scopes of study covered in this project are as the following:

- Study and analyze on the limitation of the current system. The current system is via online services (internet) and manual payment at the police station.
- Search and review from journals and articles that related to the topic.
- Study on the WAP technology on how to integrate mobile device with web server.
- Study on ASP.net programming language in order to develop the M-Summon system.
- Study on the mobile commerce framework and its applicant.

CHAPTER 2

LITERATURE REVIEW AND THEORY

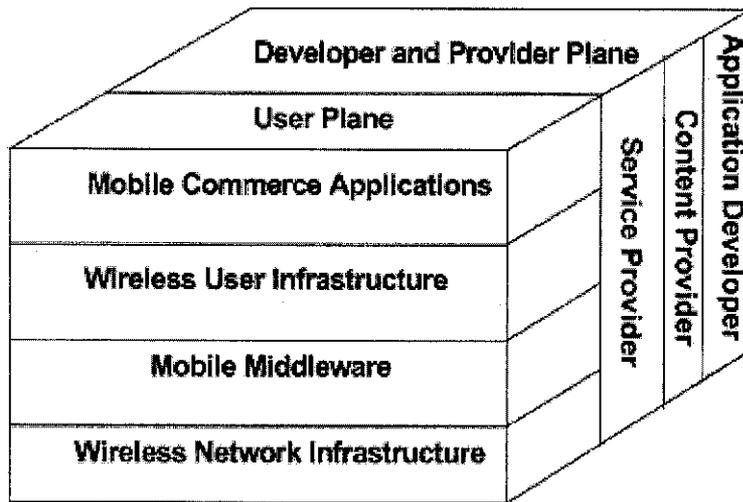
2.1 Introduction to Mobile Commerce (m-commerce)

Mobile commerce is defined as the exchanges or buying and selling of commodities, service, or information on the Internet by using mobile handheld devices. In article taken from The Yankee Group, [2] “Many major companies have begun to offer mobile commerce options for their customers in addition to the electronic commerce they already provide”. This shows that mobile commerce is an important sector to be explored and study. A journal by Do Van Thanh [1] stated that “With Mobile e-commerce the mobile user can buy and pay for things, pay his bill or make a bet via his mobile phone when on the move, anywhere and at any time”. So, it shows that mobile is very important and useful for the future related to the commerce sites.

Electronic commerce has attracted significant attention in the last few years. This high profile attention has resulted in significant progress towards strategies, requirements, and development of e-commerce applications [5]. The growth forecast for both business-to-consumers (B2C) and business-to business (B2B) aspects of e-commerce over the next few years is phenomenal by any standard. One point that should be made here is that nearly all e-commerce applications envisioned and developed so far assume fixed or stationary users with wired infrastructure, such as a browser on a PC connected to the Internet using phone lines or a Local Area Network (LAN).

Wireless and mobile networks have experienced exponential growth in terms of capabilities of mobile devices, middleware development, standards and network implementation, and user acceptance [6]. Currently, more than 800 million cell phones and other mobile devices are in use worldwide, and out of those, more than 140 million users are in US alone. The worldwide numbers are projected to rise to 1 billion soon, thereby exceeding the combined total of all computing devices several fold. In addition, countries with a lack of regular telecom infrastructure are likely to adopt wireless and mobile communications to serve both urban and rural areas. According to estimates by GartnerGroup, “in 2004, at least 40% of business-to-consumer e-commerce will be initiated from smart phones supported by WAP (Wireless Application Protocol). A study from the Wireless Data and Computing Service, a division of Strategy Analytics, reports that the mobile commerce market may rise to \$200 billion by 2004. The report predicts that transactions via wireless devices will generate about \$14 billion a year.[9]”

New m-commerce applications can be designed and supported by wireless and mobile networks and mobile middleware. How well these applications become adopted by a business will depend on how fast these applications can be deployed, the cost-value ratio, acceptance of new technologies by users and businesses based on easy to use and uniform interfaces, and the building of trust necessary to conduct m-commerce transactions while on the move. The author strongly believe that with the widespread deployment of wireless technologies, the next phase of electronic business growth will be in the area of wireless and mobile e-commerce. The author aware that consensus within business and industry of such future applications is still in its infancy.



Source: [9]

Figure 2.1: Framework for M-commerce

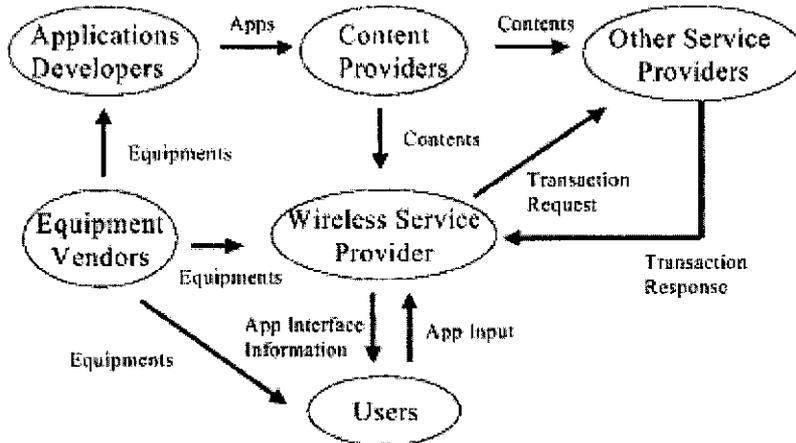
This framework will allow developers and providers to strategize and effectively implement mobile commerce applications. The framework defines multiple functional layers, simplifying the design and development, so different parties (vendors, providers, and designers, etc.) can focus on individual layers. By following this framework, a single entity is not forced to do everything to build m-commerce systems; rather, they can build on the functionalities provided by others. This will speed up the development of m-commerce applications as designers and developers can assume that certain functions will be provided by lower layers, and therefore, they need not focus on the capabilities and constraints of individual devices and networks.

This framework has four levels: m-commerce applications, user infrastructure, middleware, and network infrastructure. The framework shows that the design of new mobile commerce applications should take into consideration the general capabilities of user infrastructure (mobile devices), and not the individual devices [3]. With its ability to hide details of underlying wireless and mobile networks from applications while at the same time providing a uniform and easy to use interface, mobile middleware clearly is an extremely important component in developing new mobile commerce applications.

The network infrastructure also plays an important role in mobile commerce, as the user perceived service quality depends on available resources and capabilities of wireless and mobile networks. An open framework will prevent the design and development of proprietary products and services that may be built in an ad hoc fashion. We believe that our framework will allow interoperability of m-commerce applications and products from different providers and vendors. This would help in the adoption of m-commerce on a global scale.

The framework also provides a developer and provider plane to address the different needs and roles of application developers, content providers, and service providers. Each one of these could build its products and services using the functionalities provided by others. A content provider can build its service using applications from multiple application developers. They can also aggregate content from other content providers and can supply the aggregated content to a network operator or service provider. Service providers can also act as content aggregators, but are unlikely to act as either an application or content provider due to their focus on the networking and service aspects of m-commerce. A service provider can also act as a clearing house for content and application providers in advertising and distributing their products to its customers. In any case, the developer and provider plane in our framework is likely to have multiple layers. Wireless carriers can play a very active and important role in the mobile commerce applications and services due to the fact that a mobile user is going through their networks to perform all mobile commerce transactions.

Additionally, a mobile user is likely to prefer one common bill (bundled services) for voice, data, and mobile commerce services. However, there are many technical and non-technical hurdles (such as pricing for mobile commerce transactions) that need to be overcome before carriers can become major players in this emerging field. Many of these players and possible interactions are shown in figure 2.2



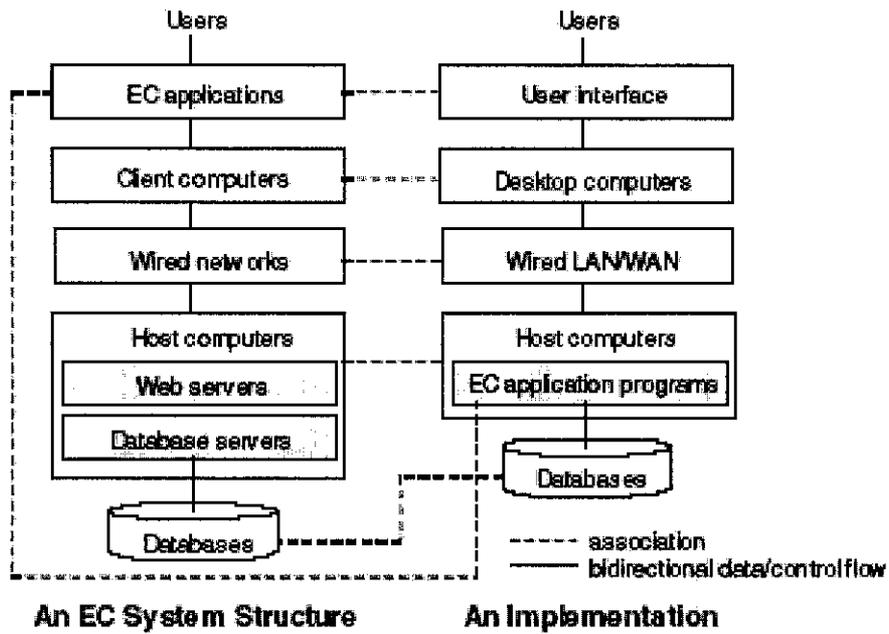
Source: [8]

Figure 2.2: M-commerce Life Cycle

2.1.1 Mobile Commerce System Structure

An electronic commerce system is an interdisciplinary subject and there are many different ways to implement it. Figure 2.3 shows the structure of a traditional electronic commerce system and a typical example of such a system [7]. The system structure includes four components:

- Electronic commerce applications: Electronic commerce is the buying and selling of goods and services and the transfer of funds through digital communications.
- Client computers: Desktop computers are used by electronic commerce, whereas wireless handheld devices are used by mobile commerce.
- Wired networks: This is the main difference between electronic commerce and mobile commerce, which must also include wireless networks.
- Host computers: A user request, e.g., database accesses or updating, is actually processed at a host computer, which consists of three major parts: (i) Web servers, (ii) database servers, and (iii) application programs and support software. These will be examined in more detail later.

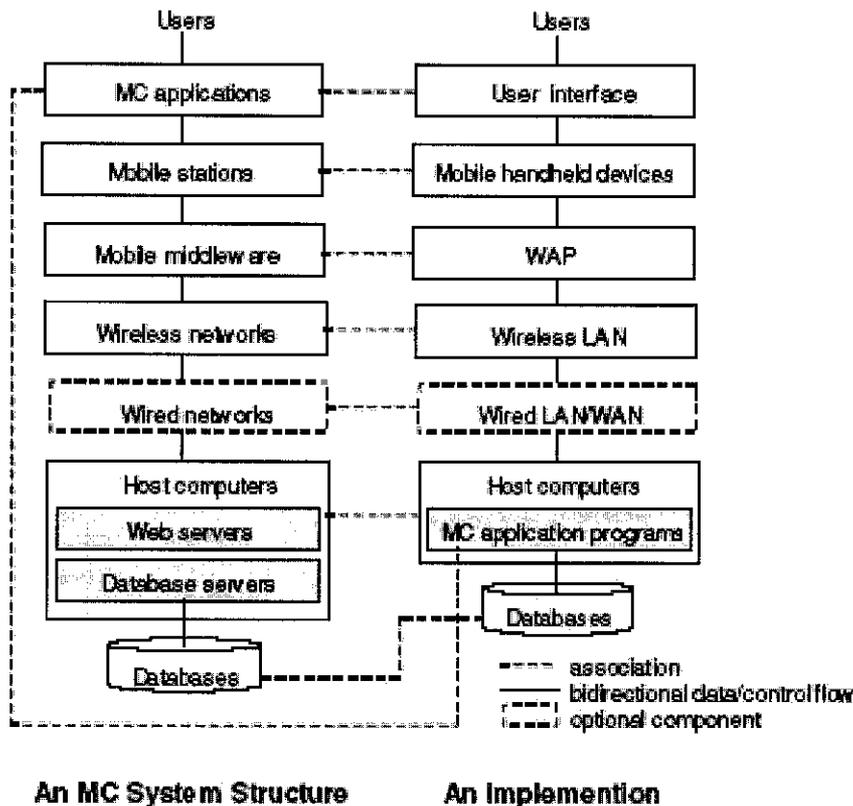


Source: [7]

Figure 2.3: An e-commerce System Structure

Compared to an electronic commerce system, a mobile commerce system is much more complicated because components related to mobile computing have to be included. Figure 2.4 shows the structure of a mobile commerce system, which consists of six components [7]:

- mobile commerce applications
- mobile stations
- mobile middleware
- wireless networks
- wired networks,
- host computers



Source: [7]

Figure 2.4: An e-commerce System Structure

Example of such a system that is currently possible based on existing technology. In mobile commerce systems, the network infrastructure consists of wired and wireless networks. The wired networks component has the same structure and implementation as in an electronic commerce system. We thus devote our effort to the part of wireless networks in this paper. All components other than the wired networks and lists of the technologies needed for the component construction will be examined in the coming sections.

2.2 Technical background

2.2.1 Network

The basic principle behind wireless communication is that information transfer takes place via electromagnetic waves. Speech can be transmitted by both analogue and digital means. Other information, such as data, is generally transmitted digitally. Electromagnetic waves are characterized by their frequency, *i.e.* the number of times per second that they alternate from positive to negative, and by their intensity, *i.e.* the field strength. The basic frequency of a signal is called the carrier wave. Information transfer, either analogue or digital, takes place through changes in this carrier wave. These might, for example, be changes in frequency (frequency modulation: FM) or in intensity (amplitude modulation: AM). Such modulation may occur continuously, as with a broadcasting transmitter, or in specific time slots, as with a GSM mobile telephone, which results in a pulsed signal. The way in which the information is transferred (by analogue or digital means) is independent of the type of signal sent by the transmitter.

Insofar as mobile telephony is concerned, wireless transfer is in fact just a small part of the overall process. For the most part, ordinary cable links are used. A mobile telephone communicates via radio waves with the nearest base station. In the base station, the signal is transferred to the fixed network. Some base stations do not have a link of this kind themselves. Instead, they are in contact (via a microwave link) with a 26 Mobile telephones base station that does have a link with the fixed network. Each base station has a limited service range, termed a cell. Since a base station can handle only a limited number of calls at the same time, the size of a cell depends on the demand for links. Cells are small in urban areas, and large in rural areas.

2.2.2 Mobile telephones

Mobile telephones are designed in such a way that they can remain in contact with the nearest base station with the least possible power. Whether this capability is fully used depends on the design of the network. The prime reason for the existence of this facility is to utilize the limited amount of energy in the battery as effectively as possible. In addition, the capacity of the network is thereby increased. The mobile telephone's power regulation means that the strength of the electromagnetic field around the telephone may vary from place to place and over time. Generally speaking, it can be said that the poorer the link, the higher the transmission power needed by the telephone to link to the base station. Conversely, it is also the case that the more antennas there are, the lower the transmission power required by the telephone will be and therefore also the lower the strength of the electromagnetic field at the telephone will be. Under ideal, free-field conditions, mobile telephones have a maximum range of several dozens of kilometres. Owing to mounting use of GSM telephones, the number of base stations is increasing. Consequently, mobile telephones generally operate at lower power, and exposure for the user will generally decrease.

2.2.3 GSM

Mobile communication according to the "GSM (Global System for Mobile communication) standard operates in the 900 MHz and 1800 MHz band. Information, both speech and data, is transmitted digitally" [11]. GSM telephones are therefore also designated as 'digital telephones', in contrast with 'analogue telephones'. With the first networks for mobile telephony set up in the Netherlands, such as NMT, a continuous signal was used instead of the pulsed signal described below. Information transfer with this now outmoded technology was carried out by analogue means. In GSM, "Time Division Multiple Access (TDMA) technology is employed, with the signal being divided into 217 information periods ('frames') per second" [11]. Each frame is in turn subdivided into eight periods ('time slots'). The first time slot has a regulatory 27 Technical backgrounds and control function in some cases, and each of the other seven

can be used for an individual telephone call. For technical reasons, every 26th frame is not transmitted. Depending on the expected number of calls that must be simultaneously handled by a base station, one or more channels ('frequencies') are installed at a GSM base station per sector. Each channel is a frequency range with a band width of 200 kHz. One of these channels has a special function in setting up and handling telephone calls. It is a kind of control channel and is always operating at full power and with all time slots completely filled (although information is thus not always transferred in all those time slots). With the additional channels, it is possible only to transmit in the filled time slots. In addition, the various time slots can be transmitted with different power levels. However, these facilities are not always used. The method most commonly adopted is for the additional channels, just like the control channel, to send out a quasi-continuous signal.

2.2.4 GPRS

The impressive growth of cellular mobile telephony as well as the number of Internet users promises an exciting potential for a market that combines both innovations: cellular wireless data services. Within the next few years, there will be an extensive demand for wireless data services. In particular, high-performance wireless Internet access will be requested by users. Existing cellular data services do not fulfill the needs of users and providers. From the user's point of view, data rates are too slow and the connection setup takes too long and is rather complicated. Moreover, the service is too expensive for most users. From the technical point of view, the drawback results from the fact that current wireless data services are based on circuit switched radio transmission.

At the air interface, a complete traffic channel is allocated for a single user for the entire call period. In case of burst traffic (e.g., Internet traffic), this results in a highly inefficient resource utilization. It is obvious that for burst traffic, packet switched bearer services result in a much better utilization of the traffic channels. This is because a channel will only be allocated when needed and will be released immediately after the

transmission of the packets. With this principle, multiple users can share one physical channel (statistical multiplexing). In order to address these inefficiencies, two cellular packet data technologies have been developed so far: cellular digital packet data (CDPD) and the General Packet Radio Service (GPRS), originally developed for GSM.

The M101 module supports GPRS. GPRS is a new bearer service for GSM that greatly improves and simplifies wireless access to packet data networks, e.g., to the Internet. It applies a packet radio principle to transfer user data packets in an efficient way between GSM mobile stations and external packet data networks. Packets can be directly routed from the GPRS mobile stations to packet switched networks. Networks based on the Internet Protocol (IP) (e.g., the global Internet or private/corporate intranets) and X.25 networks are supported in the current version of GPRS. Users of GPRS benefit from shorter access times and higher data rates [11]. In conventional GSM, the connection setup takes several seconds and rates for data transmission are restricted to 9.6 kbit/s. GPRS in practice offers session establishment times below one second and ISDN-like data rates up to 80 kbit/s.

In addition, GPRS packet transmission offers a user-friendlier billing than that offered by circuit switched services. In circuit switched services, billing is based on the duration of the connection. This is unsuitable for applications with heavy traffic. The user must pay for the entire airtime, even for idle periods when no packets are sent (e.g., when the user reads a Web page). In contrast to this, with packet switched services, billing can be based on the amount of transmitted data. The advantage for the user is that he or she can be "online" over a long period of time but will be billed based on the transmitted data volume. To sum up, GPRS improves the utilization of the radio resources, offers volume-based billing, higher transfer rates, shorter access times, and simplifies the access to packet data networks. GPRS has been standardized by ETSI (the European Telecommunications Standards Institute) during the last five years [11]. It finds great interest among many GSM network providers. At the moment field trials are being carried out, and it is expected that GPRS will be implemented in various countries by the middle of 2001.

2.3 WAP Gateway

All WAP content must pass through a WAP gateway before reaching the device providing for a single point of protection. At the gateway a scanner could be placed in multiple places. A scanner could be placed after the receipt of WML or HTML content from the origin server or after the conversion of WML or HTML to binary representation. The following diagram represents the potential placement locations at the gateway.

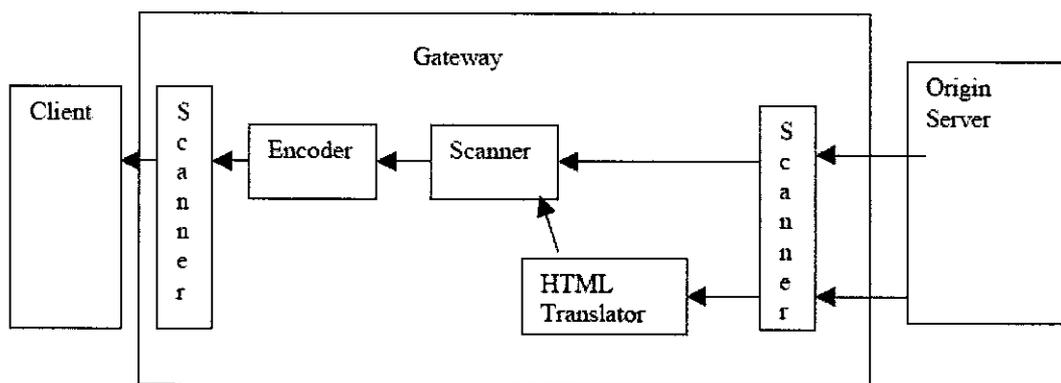
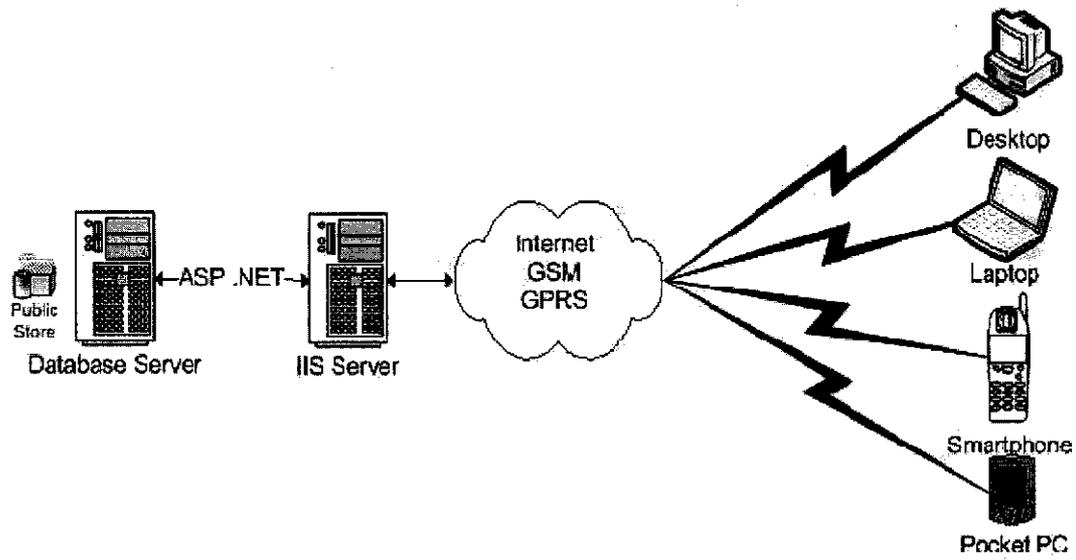


Figure 2.5: WAP Gateway

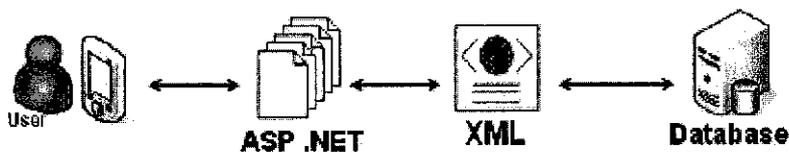
Most anti-virus products currently have the technology to detect WML or WMLScript threats. These engines would simply need to be wrapped to interact with the WAP gateway components. Users will access the system from any mobile device that uses a simple HTML or WML browser. In general the architecture will be the same with the apache server replaced from the IIS, Servlets and Mobile Agents replaced with the ASPs and the SQL Server 2000 will remain the same. The user will communicate with the ASP and he will request some action. The ASP will access the database (SQL Server 2000), collect the requested data, form the response (HTML or WML) and forward it back to user.



Source: [4]

Figure 2.6: WAP Architecture

All the data are in XML format. Users access the ASP.NET pages. The ASP.NET page collects the data from the database in XML format and formats them according to the user's device.



Source: [4]

Figure 2.7: WAP Architecture

CHAPTER 3

METHODOLOGY

3.1 Procedure Identification

The author proposed a methodology to develop the M-Summon system, known as the Waterfall Model. This methodology model called Waterfall model because of cascading effect from one phase to another phase. The effect cascading is shown as in Figure 3.1. In this model, each phase is well defined at the starting and ending point, with identifiable deliveries to the next phase. There are four phases involved in this model such as:

1. Requirement definition,
2. System and software design
3. Implementation and unit testing
4. System testing

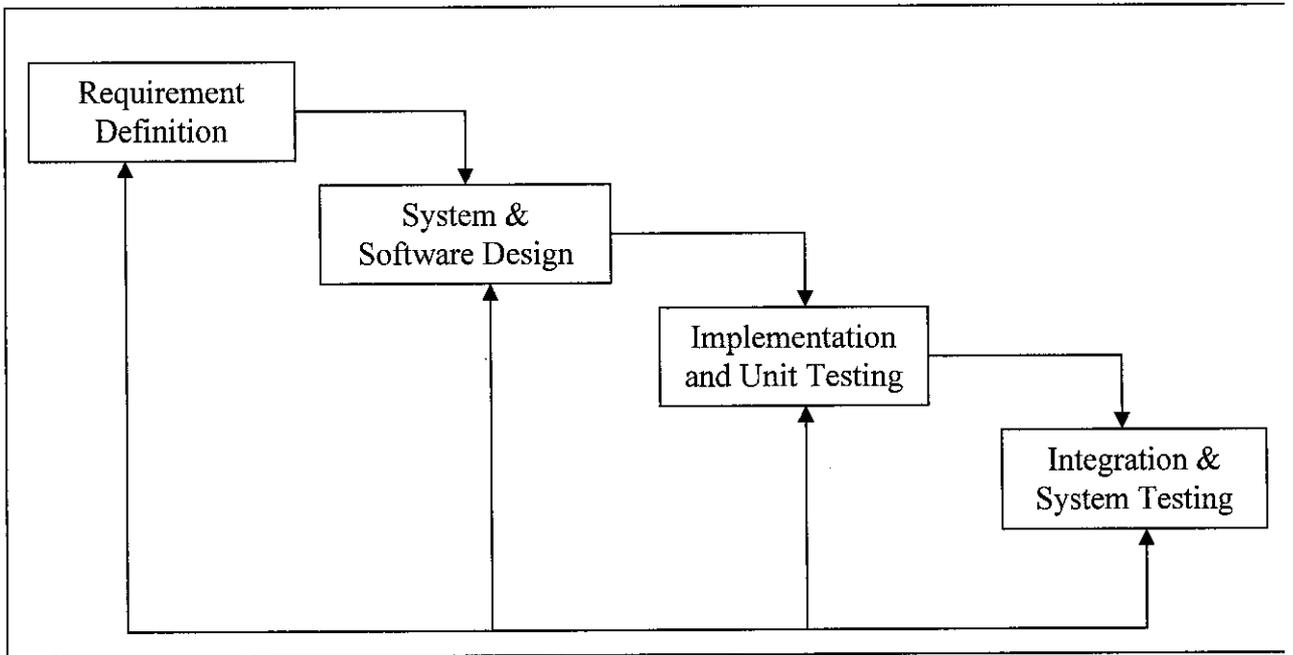


Figure 3.1 Waterfall Model

For the first phase, which is requirement definition, the problem statements were identified. With some research, the problem statements were started. With the problem statements, the objectives of the project were defined. Another research will be conduct again to identify the requirement that will be needs for the system development. The requirement for all hardware and software type will be listed and jot down in order to start purchase and search session. Next, the software that could suit with hardware use will be decided for purchase or usage purpose. All these two types of hardware and software will be use to satisfy the objective during system development For the second phase, would be the system and software design. In this phase, the components were bringing together. Next, the author conducts a research to study on the algorithm of the software and the flow of the system. Two way communications between user and the system should be studied in detail. The framework of the system should be finalize in order to avoid any problems while implement it. Other than that, the technical part should be prepared.

Then, in implementation and unit testing phase, the process of testing and checking all component that assembled in previous phase are done to ensure whether they are

working or not . After each testing process done and complete, each module that was laid out to build this system were programmed and tested individually .These purpose of individually tested are to ensure that it each module is working and to avoid any major errors.

Lastly is the integration and system testing phase. During this phase, all the modules will be combining together in order to perform the algorithm which is has been laid out in phase two. After that, the system will through testing phase and check for any errors. If any errors occurred, bugs needed to be identified and corrected. The system is the modified version as the result from feedback during testing. Once the system is already fully tested and satisfied by the end-user the final documentation is prepared to guide them in using the system.

3.2 Framework of M-Summon.

Payment for Summons

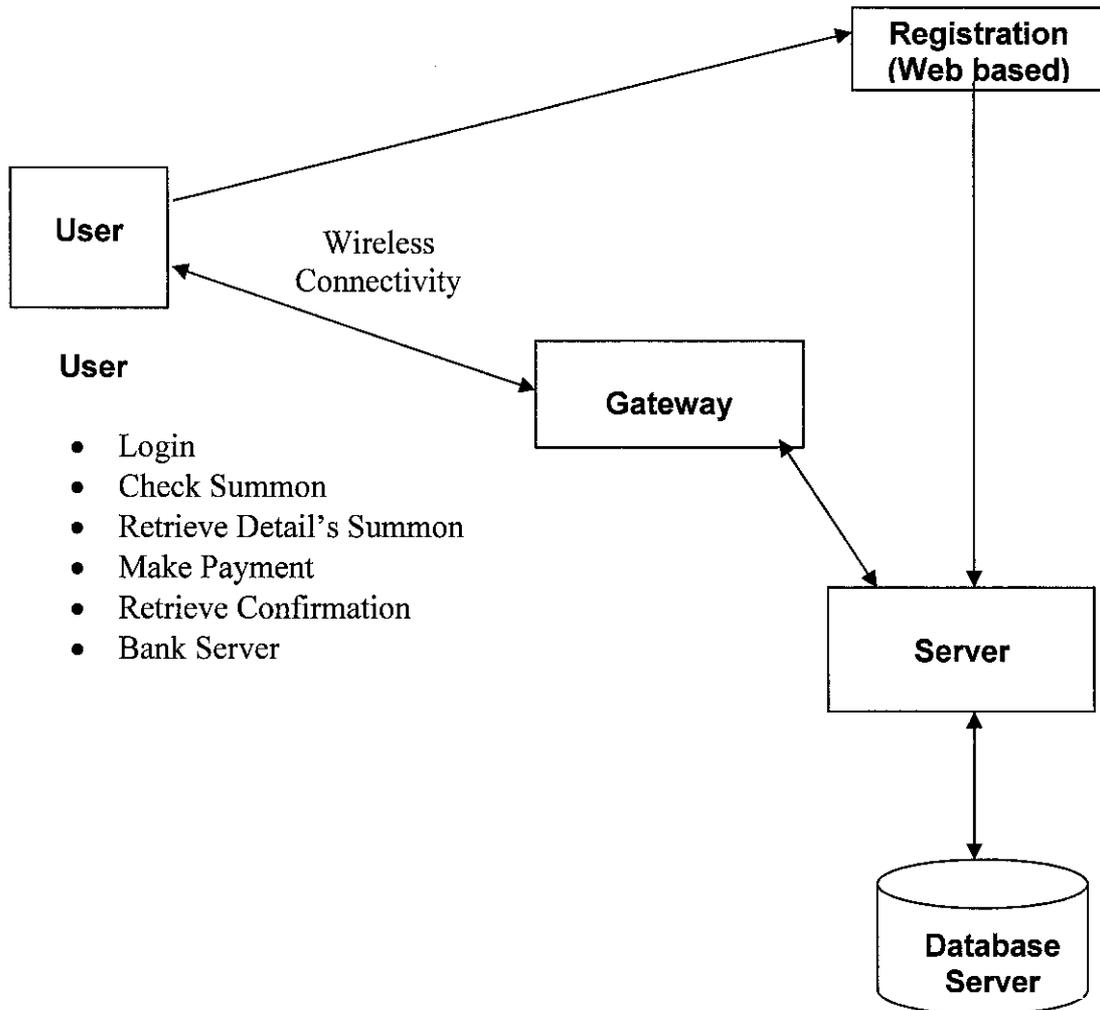


Figure 3.2: System Architecture – Overview

3.3 Detail view of M-Summon System

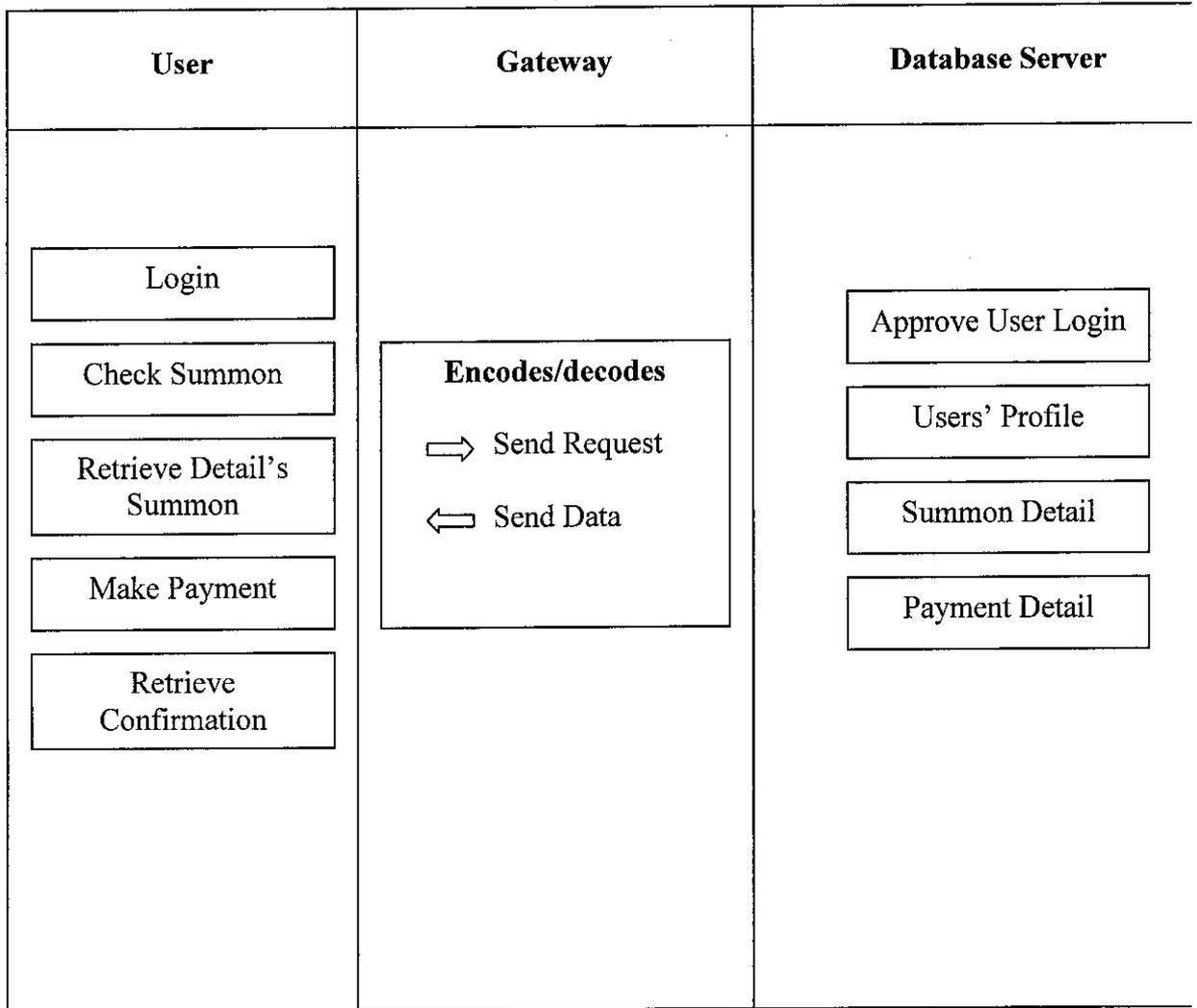


Figure 3.3: System Architecture – Detail View of Summon System

3.4 Tools Required

There are hardware and software tools that were used when building the M-Summon system:

3.4.1 Hardware

- Hand phone
- Computer

3.4.2 Software

- Windows XP/Server with IIS 6.0
 - Windows XP sp2 offers more stability and reliability over other Windows platforms.
 - Furthermore Professional Edition is bundled with Internet Explorer 6.0 and Internet Information Services 5.1 which is vital for the purpose of web hosting ASP.Net pages.
- Microsoft Mobile Internet Toolkit (MMIT)
 - Extension to Microsoft ASP.NET and the Microsoft's .NET Framework.
 - Set of server-side Web Forms Controls to build applications for wireless mobile devices, like web phones and PDAs.
 - Will generate WML code for WAP enabled cell phones and HTML code for devices like the Pocket PC or hand phone.
- Microsoft Mobile Explorer 3.0 Emulator
 - Microsoft Mobile Explorer 3.0 Emulator - Preview content for MME multi-standard mobile phone browser
 - The Microsoft Mobile Explorer (MME) Emulator assists developers in creating applications and Web sites for WAP and/or HTML-capable mobile devices.

- The emulator includes a simulator of the Microsoft Mobile Explorer 3.0 browser that compiles content for mobile devices without requiring access to wireless gateways.
- Internet Explorer 6.0 or 5.5
 - Internet Explorer 6.0 is designed to make it easy to browse and interact with sites on an intranet or on the Internet. It differs from many of the other components described in this white paper in that its main function is to communicate with sites on the Internet or an intranet
 - Internet Explorer 6.0 is also designed to be highly configurable, with security and privacy settings that can protect your organizations networked assets while at the same time providing access to useful information and tools.
- Microsoft server SQL Server 2000 Developer Edition
 - This edition allows developers to build any type of application on top of SQL Server. Microsoft server SQL Server 2000 Developer Edition
 - Microsoft server SQL Server 2000 Developer Edition will install in workstation operating systems and not restricted to server operating systems, unlike Enterprise Edition
- Microsoft Visual Studio .Net 2003
 - Visual Studio .NET can develop environment built from the ground up to enable integration through XML Web services. By allowing applications to share data over the Internet, XML Web services enable developers to assemble applications from new and existing code, regardless of platform, programming language, or object model.

- Using the integrated ASP.NET Web Forms and the Visual Studio .NET Web Forms Designer, Visual Basic and C# developers can easily build thin-client Web-based applications that render intelligently on more than 200 devices, including wireless application protocol (WAP) phones, wireless personal digital assistants (PDAs), and pagers.
- Visual Studio .NET can :
 - Build the next-generation Internet.
 - Create powerful applications quickly and effectively.
 - Span any platform or device.

3.4.3 Development languages tools

- ASP.NET script / VB script
 - ASP.NET Mobile Designer extends ASP.NET and the .NET Framework, allows development of Web applications for mobile phones.
 - This designer is integrated into the Visual Studio IDE. Thus to create mobile Web applications, the Mobile Designer is used to modify a mobile Web form.
 - It can build and run the application, all from within Visual Studio. Emulator is a simulation of the hardware and software operation of mobile devices.
 - Emulator software allows viewing of ASP.NET mobile Web Forms application as it might appear on the manufacturers' hardware devices.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Findings

Since this is the early stage of research process, the results and discussion will be mainly about available framework of the Mobile Summon System which based on the literature review being conducted and the research of the current system. As been mentioned, the author has stated the objectives that the author need to achieve in order to have successful result for this research and project. As the result the author has come out with one big solution. The chronology of this solution has been explained in detail in the methodology section whereby the author has explained starting from the information gathering and until the development of the solution

The author has come out with a system called Mobile Summon system. This system has been developing into two platforms which is mobile platform and web based platform. The web based platform is for user to register into the system. The detail about the user also should be included. The author developed another platform which is Mobile Summon System. This is the main system that involved in WAP and Gateway. The platform and tools to develop this prototype is by using:

- Mobile Devices
- Microsoft Mobile Emulator
- Internet Information Services - IIS
- The .NET Framework
- ASP.NET

- .NET Mobile

This system is based on the wireless connectivity which is involve mobile as a medium to communicate. There are several steps that the author must focus and follow. Firstly, install the .NET framework. It can install just the redistributable or the complete SDK (featuring documentations, samples, compilers, etc). Then, the author had installed the Microsoft Mobile Internet Toolkit (MMIT). This installation creates a virtual folder containing a tutorial under the default web site. It can be access it by visiting <http://localhost/MobileQuickStart/> on your web server. This tutorial is very clear and it can be useful for learning how to use your first Mobile control. The MMIT allows the author to create Multi-Device Wireless application quickly and easily. The way Microsoft has chosen to implement it is to have a file made of "forms" that will be used as the skeleton of the page.

The primary goal of .NET is to provide developers with the means to create interoperable applications using "Web Services" from any sort of terminal, be it a PC, PDA, mobile phone, and so forth. The MMIT extends the functionality of the .NET framework. It is therefore possible to build a Wireless application using any of the framework services

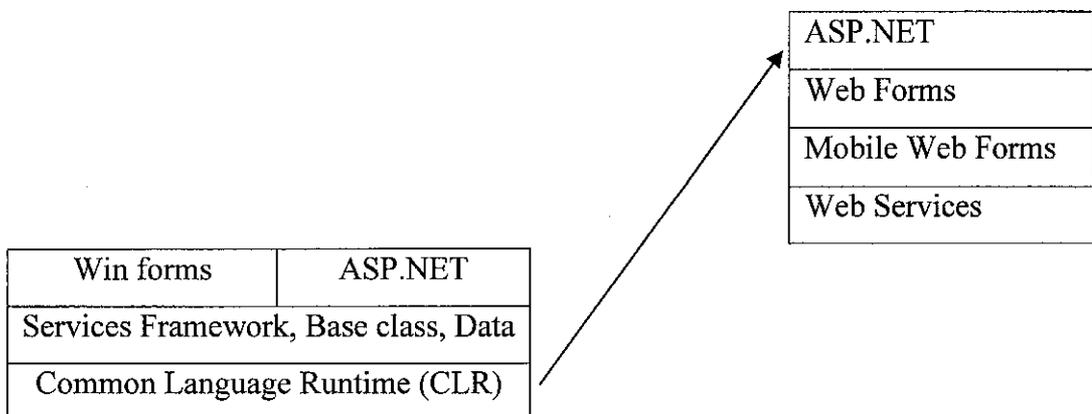


Figure 4.1: Microsoft Mobile Internet Toolkit (MMIT) Framework

User has to log on into the system. The payment can be done if the user had log on into the system. The requirements for user to pay the summons are the account number and the IC number.

4.2 Interfaces of M-Summon.

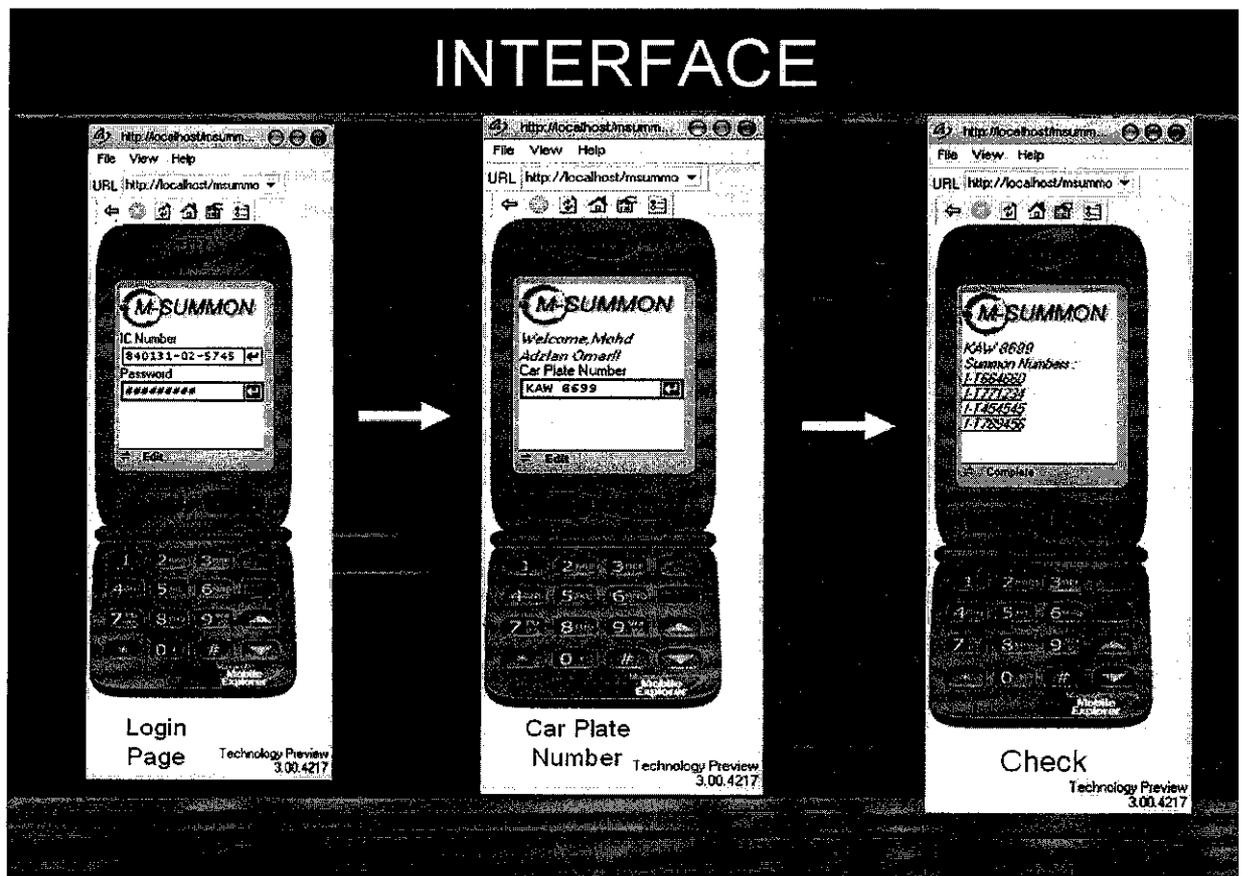


Figure 4.2 Interfaces of the Mobile Summon System

This picture shows the interfaces of mobile summon system:

Login Page:

The purpose of this page is to make sure the system more secure and reliable.

Car Plate Number:

This page consist of textbox which is user have to enter the car plate number.

Check:

The system will give the detail about the summon base on the car plate number that had been entered.

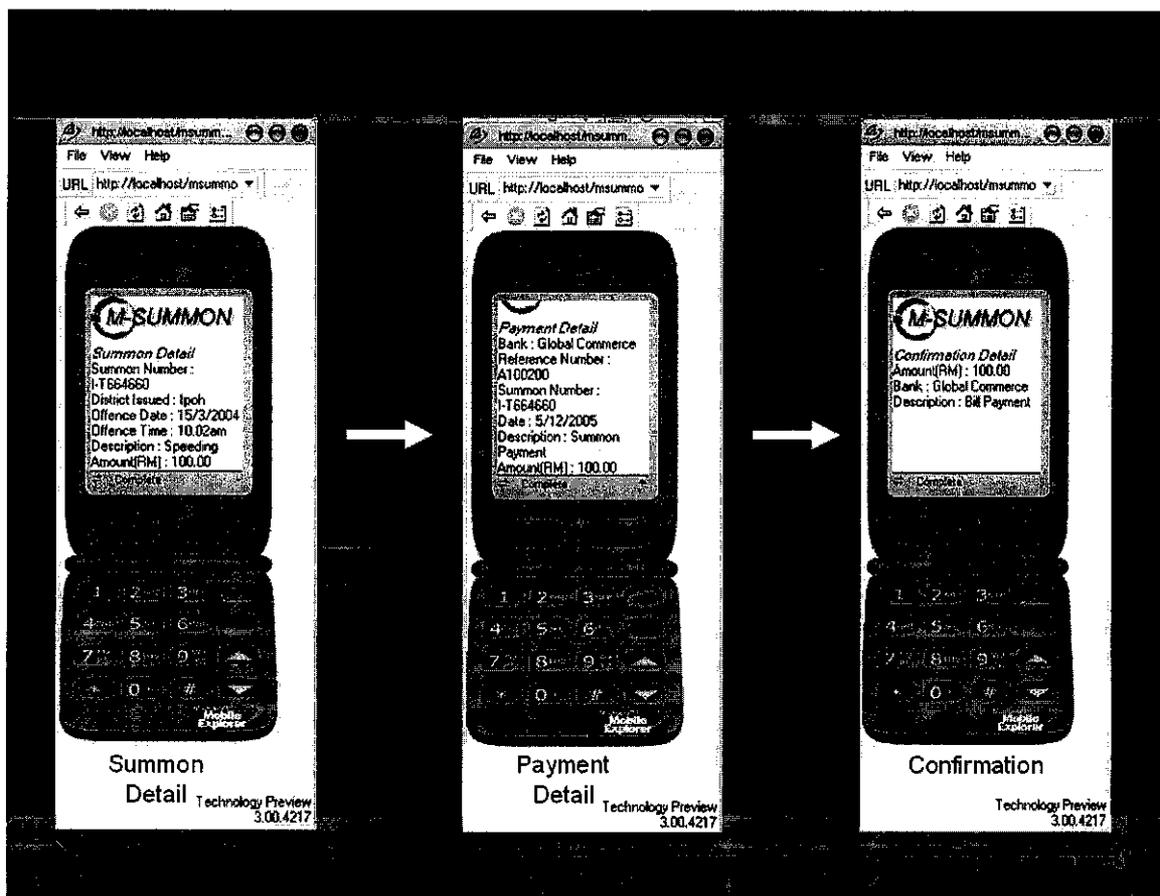


Figure 4.3 Interfaces of the Mobile Summon System

This picture shows the interfaces of mobile summon system:

Summon Detail:

The page consists of the detail about summon. The information will be display according to the summon number.

Payment Detail:

This page describes the detail about the payment. This is because to make sure user knows the detail information about the payment procedure.

Confirmation:

This page display the amount and others information about the payment. User has to confirm the payment in order to make sure it more efficient and effective.

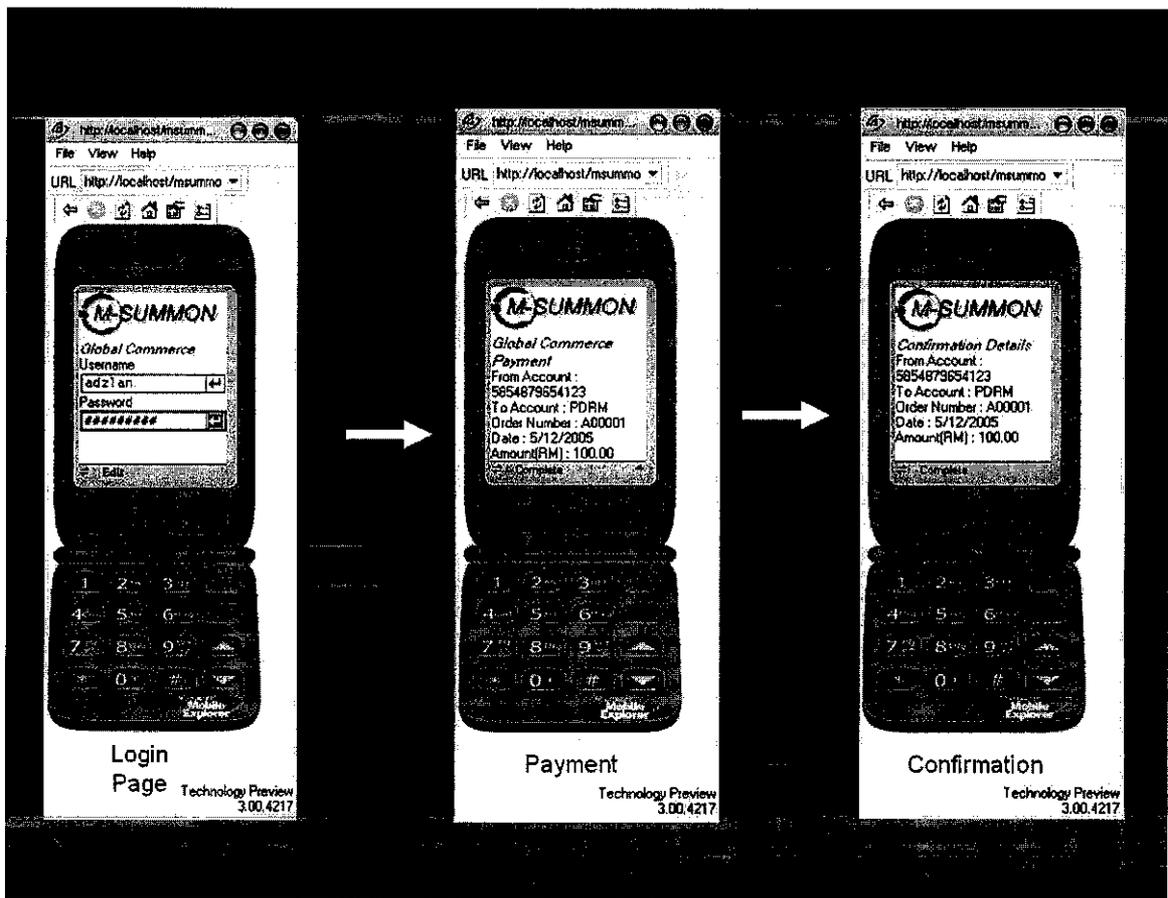


Figure 4.4: Interfaces of the Mobile Summon System

This picture shows the interfaces of mobile summon system:

Login page:

User have to login to the bank system in order to make the payment. The purpose of login is to make sure the system more secure.

Payment:

Bank System will display detail about the payment. This is for make sure user know the procedure and the amount of the payment.

Confirmation:

This page display the amount and others information about the payment. User has to confirm the payment in order to make sure it more efficient and effective.

4.3 System Evaluation

4.3.1 Method of Data Gathering User Data

Further towards the development of the product a research will be done. For this a questionnaire will be done and given to the users to evaluate this system. The purpose of the questionnaire is to elicit information on the efficiency and effectiveness of the Mobile Summon System. This questionnaire is an excellent way of obtaining either quantitative or qualitative data, since user data are written and can be tallied to illustrate preference. The user's opinion on the interface can only be evaluated from the questionnaire and not their behavior while using it.

From the initial research question, a research has to be logically designed in order to make a sensible and accurate conclusion, the following decisions were made:

- The appropriate number of participants will be from 10 people in total.
- Since there is a time constraint, this technique can only be done one round
- Structured questions would be used for the questionnaire so that evaluators can analyze and understand the data well

The main steps involved in conducting the survey included:

- Identifying and contacting respondents to gain their agreement
- Designing and sending the questionnaire to the intended user
- Analyzing the results of the first round
- Producing feedback
- Preparing the final presentation of results

Before making sure that the people who are in this survey are individuals who have a deep interest in the subject matter and the knowledge can be valuable for the study is

very important. Therefore later in the study, a number of qualified individuals have to be selected to answer the questionnaire and their opinions on the subject matter.

4.3.2 Result of User testing

From a conducted testing and survey with students, based on the questionnaire in Appendix 4, the system is deemed usable and useful. Testing of the prototype was conducted by 10 students and they were required to fill the questionnaire. The result of the testing and survey with reference to the questionnaire in Appendix 4 are shown in Figure 4.5 below;

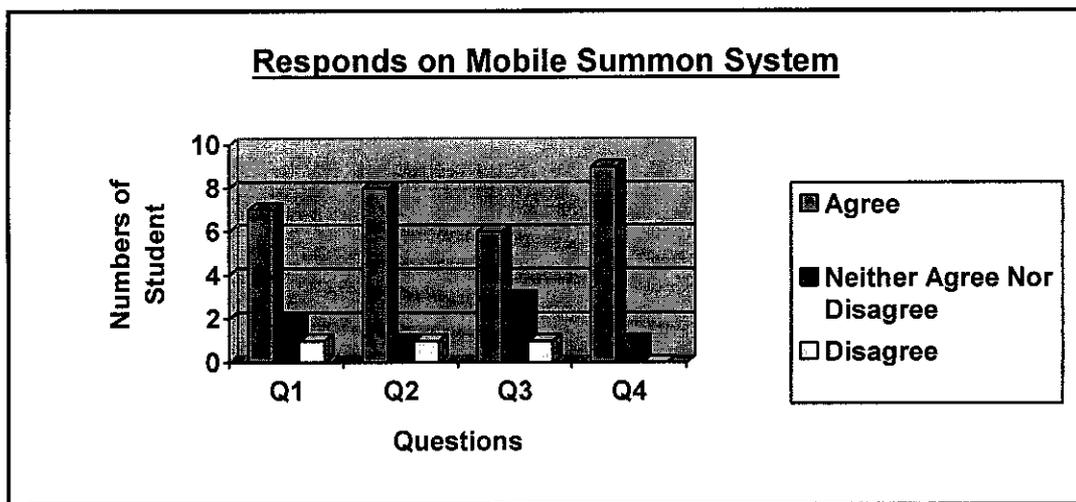


Figure 4.5: Respondent on the Usage of Mobile Summon System

Rating	Q 1	Q 2	Q 3	Q 4
Agree	7	8	6	9
Neither Agree Nor Disagree	2	1	3	1
Disagree	1	1	1	0

Table 4.1 Result of testing

	Question	Rating		
1	The system is easy to use.	1	2	3
2	The system flow is easy to follow.	1	2	3
3	The content of the result / is understandable	1	2	3
4	The system is valuable and important to people.	1	2	3

Table 4.2 Example of Question

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Overview

This paper discusses about the Mobile Summon system and its functionality. It also discusses on the basic on M-Commerce and the WAP application which are according to the scope of study. Conclusion and recommendation for this interim report will concentrate on the next phase of research process.

5.2 Conclusion

Mobile commerce is an interesting and challenging area for research and development. In conclusion, this project is expected to achieve the objectives in order to reduce the current problems due to the payments system. The current system that has been identified was payments via online services (internet) and payment manually in which user has to find police station to pay summons. The problem that occurs is, when the internet is down user cannot pay summon because they cannot surf into the web sites. The other problem is when user does not have time to pay summons at police station. Nowadays, people always busy with their work and activities. They do not have a time to go to police station to pay summonses. This system could reduce the main current problems due to the payment of summons. By using this product, it will be more convenience to make the payment. Broad knowledge understanding in both Mobile Commerce and WAP applications is the key to success in this project which is M-Summon system.

5.3 Recommendation

In the coming stage on research, this system can be applied in the others organization such as Jabatan Pengangkutan Jalan (JPJ) that involves in transaction. Additional functions also can be developed such as make payment through credit card. Notification to the users regarding summon status can also be provided and implement in order to avoid late in payments. System framework has to be studied in order to get an accurate architecture for the project to be done successfully.

5.3.1 Apply in others organization

Currently, this system is being proposed to the Polis Diraja Malaysia (PDRM). The department involves is the traffic unit that handle summonses. These Mobile Summon System involves in summon payment and it can be applied to others organization such as JPJ. JPJ has almost the same functionally with Polis Diraja Malaysia (PDRM). The functionally of Mobile Summon System can be modified and implemented in JPJ.

5.3.2 Notification using Short Messaging Service (SMS)

Short Messaging Service (SMS) is a service that sends electronic text messages over a wireless network. This is also known as text messaging. Currently, people are always busy with work and do not have a time to check for summonses. In future, to overcome this problem this Mobile Summon system should add the same functionality that involving Short Messaging Service (SMS). Once users got summon, the system automatically can send notification to the user. This alternative would make user aware and pay the summons immediately. So, it would overcome problems in terms of late payment.

5.3.3 Payment through credit card.

Currently, Mobile Summon System just provides payment through banking system that requires fund in users account. Credit card is a card that indicates the holder a granted line of credit. It enables the holder to make purchases or withdraw cash up to a prearranged ceiling. The credit granted can be settled in full by the end of a specified period or can be settled in part, with the balance taken as extended credit. Credit card is a type of bank card that can be widely used all around the world as a form of payment. If the payment can be done through the credit card, it makes the payment more efficient and effective.

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[12] <http://www.rmp.gov.my/rmpnew/rmp/kdnka/kdnkaenglish/traffic.htm>

[13] http://www.rmp.gov.my/rmp03/statistik_opsikap10_2006.htm

[14] <http://www.devarticles.com/>

APPENDICES

Appendix 1: Sample Summon

There are two types of summonses:-

Pol. 257

(Polis 257—Pin. 2/86)

JADUAL
(Kaedah 2)

F 378352

ASAL

ORDINAN LALULINTAS JALAN, 1958
KAEDAH-KAEDAH LALULINTAS JALAN (NOTIS SEKSYEN 45A) 1962

Kepada
No. Kad Pengenalan
Alamat

No. Pendaftaran Kenderaan Jenis Kenderaan

BAHAWASANYA saya mempunyai sebab-sebab yang munasabah untuk
mempercayai bahawa kamu telah melakukan kesalahan yang berikut di bawah:

Seksyen Ordinan Lalulintas Jalan 1958
Kaedah Kaedah-Kaedah
di (tempat)
pada (tarikh) jam (waktu)
Kesalahan

KAMU ADALAH DENGAN INI DIPERINTAHKAN supaya hadir sendiri
atau melalui Peguam di hadapan Mahkamah Majistret di:

Pada 19 pukul pagi/petang
Dikeluarkan pada 19 pukul pagi/petang

Penerima

Pegawai Polis/Pegawai Pengangkutan
Jalan

NOTA: Kesalahan ini boleh/tidak boleh dikompau

"Jika kesalahan ini boleh dikompaukan, kamu dinasihatkan boleh meng-
kompaukan kesalahan ini di sebelum"
dan di dalam Bahasa Inggeris:

"If the offence is compoundable, you are advised to have the offence com-
pounded at before"

UNTUK KEGUNAAN PEJABAT

Kes dikompau

	Ringgit
1	
2	
3	

Pegawai Kompau

10-PHMM... K.L.

Source: [12]

Appendix 2: Sample Summon

Pol. 170A

D 121751

(Polis 170a—Pin. 1986)

POLIS DIRAJA MALAYSIA

**PEMBERITAHU KESALAHAN LALU-LINTAS
(NOTIFICATION OF A TRAFFIC OFFENCE)**

Waktu (Time) _____ Tarikh (Date) _____
Tempat (Place) _____
No. Kesalahan (Offence No.) _____ (Sebagai ditunjukkan di belakang borang ini) (As specified on back of this form)

Kepada Drebar (To Driver of) _____ No. _____

Nota:
Dengan ini diberitahu bahawa kesalahan tersebut di atas telah dilakukan.
Tuan diminta mengisikan butir-butir di bawah ini dan mengimarah balik borang yang telah dipentrukan ini kepada _____ dalam masa _____ hari dari tarikh pemberitahuan ini.

Sekiranya ada apa-apa keberatan yang Tuan hendak nyatakan mengenai aduan ini, bolehlah dikemukakan bersama-sama jawapannya.

(You are hereby notified that the offence mentioned above has been reported.)
(You are requested to fill in the particulars below and return the completed form within 7 days from the date hereon.)

(Should you wish to offer any explanation regarding this report, it may be forwarded together with the reply.)

Tarikh (Date) _____ Tandatangan (Signature) _____
Pejabat yang mengeluarkan (Issuing Office) _____
No. _____ (Office Stamp)

**JANGAN CERAIKAN BAHAGIAN INI
(DO NOT DETACH THIS PORTION)
BUTIR-BUTIR MENGENAI DREBAR
(DRIVER'S PARTICULARS)**

Nama (Name) _____
Alamat (Address) _____
No. Kari Pengenalan (Identity Card No.) _____
No. Lesen Drebar (Driver's Licence No.) _____ Dikeluarkan oleh PPKM (Issued by PPKM) _____
Pada (Date) _____ Habis Tempoh pada (Expires on) _____
Tarikh (Date) _____ Tandatangan (Signed) _____
Drebar (Driver) _____

Source: [12]

Appendix 3: Statistics Summon (OPS SIKAP X, 2006)

**SAMAN YANG DIKELUARKAN
OPS SIKAP X (2006).**

HARI	TARIKH	SAMAN		JUMLAH
		POL.170	POL.257	
1	23 / 1 / 2006	6020	3418	9438
2	24 / 1 / 2006	7554	3396	10950
3	25 / 1 / 2006	8187	3873	12060
4	26 / 1 / 2006	7698	3301	10999
5	27 / 1 / 2006	8017	3911	11928
6	28 / 1 / 2006	7145	1307	8452
7	29 / 1 / 2006	6478	3253	9731
8	30 / 1 / 2006	6701	3109	9810
9	31 / 1 / 2006	7030	3531	10561
10	1 / 2 / 2006	6897	3548	10445
11	2 / 2 / 2006	9382	4237	13619
12	3 / 2 / 2006	7013	3685	10698
13	4 / 2 / 2006	6258	2872	9130
14	5 / 2 / 2006	7151	3168	10319
15	6 / 2 / 2006	7372	4358	11730
JUMLAH		108903	50967	159870

SOURCE [13]: CAWANGAN TRAFIK BUKIT AMAN.

Appendix 4: Questionnaire for Student

Mobile Summon System Student Questionnaire

Disagree	Neither Agree Nor Disagree	Agree
1	2	3

With reference to the Liker Scale above, circle the extent to which you agree with the following statements.

	Question	Rating		
1	The system is easy to use.	1	2	3
2	The system flow is easy to follow.	1	2	3
3	The content of the result / is understandable	1	2	3
4	The system is valuable and important to people.	1	2	3