Mobile Ticketing Framework for Malaysia's Cinemas

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ABSTRACT

From simple and manual life into electronic services finally into mobile electronic services, the solutions of mobility services made it easier to obtain many things at anytime and anywhere, with this new services and technologies the time has come to open an another marketing channel to express product and services to the consumers. Where in strong economic structure and the successful commercial marketing, the electronic commerce Including (electronic ticketing, mobile commerce and mobile ticketing) is changing the style of company's marketing, production, and operation, in addition it facilitated the life, reduced the cost and increased the profits.

In context of mobility is a crucial part of the work, this research addresses to design and development a reservation system prototype based mobile e-ticketing for Malaysia's cinemas with kedah's scope. This prototype contains two parts, web and wap application service, web application to make ability to manage cinemas and the wap application to give the user the possibility of booking by using mobile phone.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

The widespread use of mobile devices and increment of user and corporations requirements It has attracted the attention of researchers and developers to meet these needs and making it more (convenient, safety, profit etc). Therefore, the applications and inventions endeavor to making mobile phone not only a mobile phone anymore by presenting many additional facilities (services and techniques). Recently, the mobile phone has gone from being a simple voice-service to becoming a multipurpose service platform.

Most of people now carry mobile phone and use its technologies in many different situations. Within a decade, mobile phones have evolved from devices that were used by a few technology enthusiasts and business-men for calling, now mobile technologies has been greater than before, it is not only for calling or sending messages between people in normal case, now and based on modern life and the needs of the user and request the companies continued to raise the rates of sales and profits, mobile application allows to the users to use the information technology without being bound to a single location; it provides the users with the flexibility. This technology enables users to the access any time in any location.

Previously the interesting was given to transfer services to the internet environment and make their in online services (electronic services), then started to pay attention to relocate these services to more flexible and easy environment (Mobile services), mobile services are part of the introduction of new technology in business and the potential in various industries. The appearance of mobile commerce (or m-commerce) urged producers towards the serious of electronic wireless media because the next phase of e-commerce growth will be in the area of mobile commerce (Carlsson, Carlsson, & Walden, 2004). More recently, the development of mobile internet services has introduced great potential for benefiting businesses in different fields (Mattila, Oksman, & Vainio, 2007). For example, health care, construction business, and passenger transport are fields where mobility is a crucial part of the work. If mobile services can be successfully used to support this work, the benefits will be large (Mattila et al., 2007).

The emerging technology behind M-Commerce is based on the Wireless Application Protocol (WAP). Michael Heidemann, product manager for Nokia Mobile Phones Sales (Heidemann, 2004) said " WAP is becoming an essential part of the future third generation wireless networks. WAP is set to be as crucial for mobile internet access as HTTP was and is for the World Wide Web. An easy use of mobile and wireless technology given a new application, using m-ticketing is reduce the costs and the effort, and good example of client services, and improve ticket validation will make it a good choice for concerts, sporting games, movie theaters, and public transportation.

Findings in (TEO & POK, 2003) showed that the Internet activities respondents are less enthusiastic in shopping online using a fixed terminal such as PC. In contrast, respondents expressed their willingness to buy concert/cinema tickets using a WAP-

enabled mobile phone. One possible explanation could be that the decision to watch a movie may often be made on an impromptu basis where fixed terminals such as PC may not be readily accessible. Thus, the ability to order tickets anywhere, anyplace and anytime through a WAP-enabled mobile phone makes it the ideal device for such transactions.

In context of business and mobility is a crucial part of the work, this research proposed a mobile e-ticketing reservation prototype for cinema of malaysia with kedah's scope, where it contain two parts, first is an web part to manage the cinemas in kedah, second is an wap part to make a mobile e-ticketing reservation with its facilities.

1.2 Problem Statement

The difficulty and the lack of flexibility to obtain a cinema's ticket in any place or any time it is the main problem in this study, the current system either is manual or online. therefore it is usually difficult to go to the cinema and choose the movie time and seat, we sometimes go twice, the first booking a ticket and second to watch the movie, unfortunately sometimes we reach there but we do not find any ticket, it is consume a lot of time and effort, that mean going more than one time to cinema , waiting in a long queue and maybe do not get ticket, The other option is booking online and this also requires computer and Internet, which is also sometimes not available.

Therefore, it will be more efficient if we design mobile system application which will eliminate and avoid the loss of time and avoid waiting queues, nor is it necessary to have a computer and the Internet. It is best of all you can do the booking while we

are in home or office or street. The capability to order tickets anywhere, anyplace and anytime through a WAP-enabled mobile phone is considered as an ideal device for such transactions (TEO & POK, 2003)

1.3 Research Questions

- What are the requirements to do a cinema mobile ticketing application?
- How can we let the users get cinema reservation at anytime and anywhere and without lose time and effort?
- How we can improve cinema sales?

1.4 Objective

- Identify the requirements of the proposed system.
- Design and develop mobile ticketing application by using the mobile payment method where users can check credit balance (account) of their mobiles through the framework.
- Open an another cinema sale channel to express services by mobile ticketing application

1.5 Significant of Research

This study will provide many benefits as bellow:

- Creation of a new interaction channel for movie fans and visitors in Malaysia to be more flexible and easier for users and more useful to the cinema.
- The surest and faster in finding solution for ticket booking process anytime and anywhere.
- Adding a valuable feature to the proposed solution by make the balance of the mobile more useful to pay the ticket (mobile payment method).

- Increase the satisfaction of end users through mobility.
- To increase the usefulness of the cinema and its sales after facilitate interacting with the user where the cinema is the other beneficiary of this application.
- Offer an innovative service to challenge competitors and invest mobile technology to streamline cinema entry process.

1.6 Limitation and scope

The scope of this study is the design and development of mobile application for booking of cinema tickets in Malaysia and exactly in Kedah.

1.7 Report Structure

Chapter two will presents a review on the literature of mobile content, adaptation, concepts and mechanisms, chapter three will focuses on the methodology used in this project in order to achieve the purposes of the study, chapter four will discusses site design and architecture based on the results of the proposed system using the methods described in the previous chapter, chapter five will elaborate the result for this study, chapter six will describe the project limitations, future recommendations and concludes the conclusion of this project.

1.8 Summary

In this chapter a brief background about the study, problem statement, objectives, scope and contribution of the project were presented. This chapter gave a clear picture about the proposed solution of this study and the expected output from it, which it is, mobile e- ticketing reservation (booking/ticket purchase) application Prototype for Malaysia cinemas.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a brief overview on mobile technologies. this chapter addresses the combination of several important research fields, the combination of these fields consider as an one extension view to address this thesis : Electronic Commerce, Electronic Ticketing, Mobile Commerce, WAP, Mobile Ticketing and Mobile Payment, where some of these fields have been discussed in a vast amount of literature over many years, but publications on other fields still tackling an area full of forecasts, assumptions and sometimes speculations (Hampe, Schubert, & Schneider, 2004). Then the study currently is being moved to mobile content in more detail. Finally, the review focused on using mobile technologies.

2.2 Electronic Commerce

E-commerce it is a new concept that explains the process of selling, buying, exchanging goods, services and information through digital processing over the Internet. It is an electronic market that includes customers, suppliers, companies, stores, middlemen and buyers (Ahmad, 2008). The internet has become one of the most important ways for communications; business, marketing and shopping became

available medium anywhere. It shows a collection of new ways to reach the customers for what they ask for. The Electronic Commerce is a good example which shows how the internet can be used as a marketing, and business. There are many definitions of the E-Commerce, according to (Hesterbrink, 1999), E-Commerce is the project that designed for get the success in the Information Economy. Electronic-Commerce trade and doing business online (DZNet, 2007).

(Ahmad, 2008) study has been categorised varying definitions of e-commerce as follow:

- In communication world: E-commerce is defined as a way to conduct information, services, or products through telephone lines or through the Internet.
- In business world: E-commerce is an applying technique that facilitates the execution of business procedures.
- In services: E-commerce is defined as a tool which assists companies and consumers by decreasing the service cost while increasing its efficiency.

Generally the term of "e-commerce" was first introduced and understood as transactions over the Internet, as e-commerce evolves, the horizon of e-commerce expands, as the execution of purchase and sale, or any other organization management activities over the Internet or the Web, Also, e-commerce includes any form of business activity carried out by electronic means, which could range from products or services information to selling and/or buying products or services (P. Gary, R. Wigand and R. Kalakota) ac cite in (J.K.Choi, J.S.Park, J.H.Lee, & K.S.Ryu, 2006).

There are two main forms of e-commerce (Types of E-commerce) as mentioned (Ahmad, 2008):

- Business-to-Consumer (B2C)**:** E-commerce operates from companies to individual consumers. It represents the commerce exchange between both of them. B2C is used to get more products. Consumers deal directly with the organizations because all the intermediaries are cut out and purchasing is done directly from the warehouse.
- Business-to-Business (B2B): E-commerce from companies to companies. B2B works on communications between companies to make purchasing. "There is common types of business function can be done through e-commerce:
    - EDI (Electronic Data Interchange)
    - EFT (Electronic Funds Transfer)
    - Purchases
    - Marketing and promotions"

(Trepper 2000) as cite in (Ahmad, 2008) said "E-commerce is an enabling technology that allows business to increase the accuracy and efficiency of business transaction processing".(Ahmad, 2008) "e-commerce is not a physical asset which could easily be secured in a warehouse, rather it is an electronic network market, which includes continuous interaction of millions of different consumers participating from different places around the world, and who rarely if ever know each other".

(J.K.Choi et al., 2006) e-commerce is changing the business process and it is also changing the way the transactions are made. Among the multitude of computer-based applications and telecommunications applications in the modem era, the emergence

and use of e-commerce is the biggest impact on the different types of organizations such as companies, government personnel, and so on.

(Zhongjun, Lijuan, & Qihai, 2008) said "the influence of e-commerce on governments, entrepreneurs, and individuals has emerged- it is changing the mode of government management in fields of politics, economy, military, culture as well as the way government operates. Additionally, in social and economic life, the e-commerce is changing the style of company's marketing, production, and operation, together with people's way of thinking, working, living, and studying." So In e-commerce activities, electron is always a base. Because of its surprisingly high speed, in e-commerce practices, we tend to transfer all information through the Internet in order to maximize the efficiency of e-commerce transaction.

Determining factors and performance measures in e-commerce has been proposed in many studies, (R. Plant 1999)as cite in (J.K.Choi et al., 2006) studied the success factors with over 40 organizations in United States and Europe and determined the following seven key success factors in e-commerce: financial impact, competitive leadership, brand, service, market, technology, and site metrics. (Huff el al, 2000) as cite in (J.K.Choi et al., 2006) emphasized nine key success factors in e-commerce : value in term of convenience, information value, disintermediation, reintermediation, price and choice; niche market; flexibility; geographical segmentation; technology; critical perceptions; exceptional customer services; effective connectedness; thorough understanding of Internet culture.

H. Hahn and M. Noh, (1999) as cit in (J.K.Choi et al., 2006) use critical failure factors (CFFs) to examine the factors that restrain the growth of e-commerce where they listed 44 variables and through empirical study, they classified them into the

following 6 CFFs:lower level of data security, inconvenient use, unstable systems, lack of information mind, dissatisfied purchasing, and social disturbance.

T. Sung (2004) as cit in (J.K.Choi et al., 2006) summarized the factors of e-commerce as the security of information & systems, privacy Of customer information, stability of systems, cost of operations, metrics for e-commerce operations and web sites, ease of use, proper presentation of information about goods and services, customer orientation, e-commerce strategy e-commerce expertise in both technical and managerial perspectives, payment, delivery, competitive price, speed, services, variety of goods and services, web design, and marketing, trust and loyalty of customers.

Also in (J.K.Choi et al., 2006) suggested and introduced an evaluation model of competitiveness of an e-commerce corporate , and determined the key success factors are mainly composed of three parts tangible assets, intangible assets and processes. The authors in this study advised that e-commerce corporate should have a thorough review and lookout for key success factors an e-commerce corporate which has been suggested, Figure 2.1 show these factors.

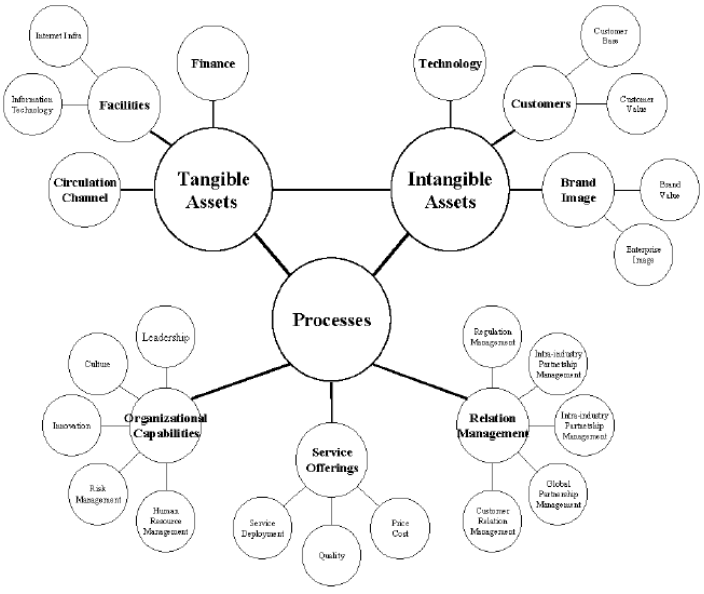


Figure 2.1: The key success factors of e-commerce corporate (J.K.Choi et al., 2006)

According to (C. w. Lee, Hu, & Yeh, 2003) the structure of a traditional electronic commerce system and a typical example of such a system, as show in figure 2.2 the system structure includes four components:

1. Electronic commerce applications: Electronic commerce is the buying and selling of goods and services and the transfer of funds through digital communications.

2. Client computers: Desktop computers are used by electronic commerce, whereas wireless handheld devices are used by mobile commerce.

3. Wired networks: This is the main difference between electronic commerce and mobile commerce, which must also include wireless networks.

4. Host computers: A user request, e.g., database accesses or updating, is actually processed at a host computer, which consists of three major parts: (a) Web servers, (b) database servers, and (c) application programs and support software.

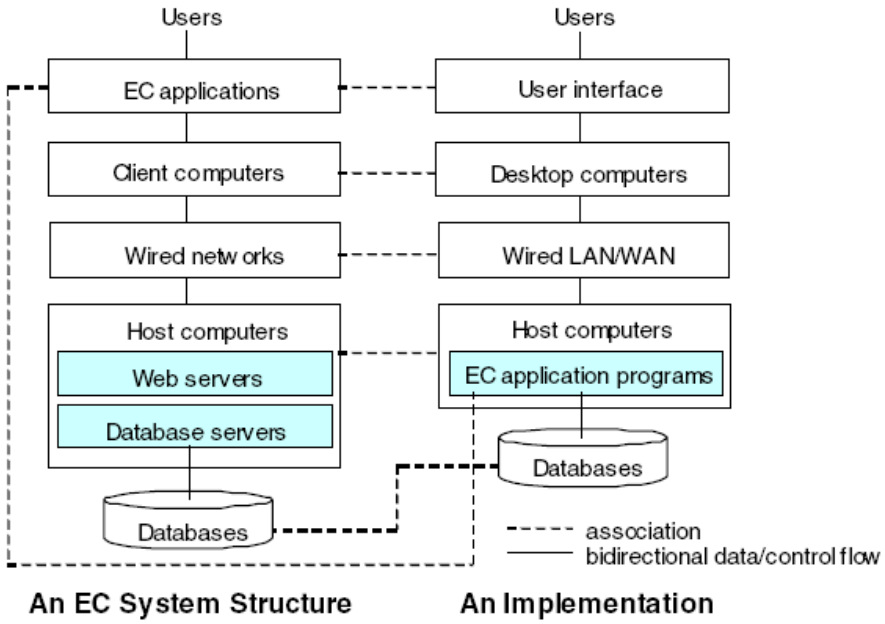


Figure 2.2: An electronic commerce system structure (C. w. Lee et al., 2003)

(Ahmad, 2008) has been mentioned that the Benefits of E-commerce are, more effectively and highest profits for marketing, reduce companies spending, highest interaction between companies and consumers, saves time and effort, and free access selection.

2.3 Electronic Ticketing

One of the most important services in E-Commerce is E-Ticketing. An electronic ticket (E-ticket) is “simply a record of a reservation made using a valid credit card number stored in the computer database of the airline company” (D. I. McCuhbrey, 1999) as cite in (Wan & Che, 2004). According to (Zwass, 1998), the traditionally ticketing services are transactions that are not supported with IT. This kind of ticketing conducts using paper, telephone or fax. After the revolution of the internet we must change the way from traditional to e-ticket.

According to (Wan & Che, 2004) E-ticketing has been first introduced by an American airline named ValuJet in August 1993. E-tickets widely accepted in US. By early 2000, E-ticketing had become universal in North America and symbolizes for the total reservations for main carriers over 40%. In Asia, E-tickets first introduced in Hong Kong only in 1999, followed by Singapore, Japan, China, and other Asian countries. The awareness and acceptance level by travelers towards E-ticketing in Asia Pacific region appear to be law at the moment. It was reported that only 11% of the readers have ever used E-ticketing (A. Hoosain, el al. 2000, Z. Coleman, 2000, p. S7), as cite in (Wan & Che, 2004) .

There are some examples of Internet ticketing all over the world, especially in the airline industry. E-Ticketing is "the foundation" on which airlines can reduce costs

and improve customer service (goliath, 2007). The reservations for airlines scenario as an example can be made through call centers or the Internet websites of airlines or travel agency. While all E-ticketing details are stored in the database of airline and no paper ticket is issued, the travelers will not have to waiting for the delivery of paper tickets or dealing with losing tickets .In place of that, they have to go to the check-in counter of their Airline destination with their confirmation number and itinerary/receipt forwarded by email or fax, and their photo identity card for check-in procedure, Or simply, the travelers may bring the credit card that has been used for ticket purchase at the express check-in kiosk for identification, and reconfirm the flight details for boarding pass automatically issued by the kiosk(Wan & Che, 2004). With the traditional system, passengers have to carry physical tickets at all time of traveling. But with e-ticketing, all related information will be stored digitally in a central database and therefore there are no changes of the traveler losing them or having them stolen (Joseph et. al, 1997). In line with this context, and with the advance of the Internet, there has evolved the needs to change the traditional ticketing to E-Ticketing.

The strategy of E-Ticketing has been well exploited in the airline segment (Jones, 2004), anyway in public transportation as a whole, especially the railway, metro, bus, implementation techniques have been mixed due to the changing business environment and travel culture. The major functions of an airline ticket are to confirm to airline staff that the travelers have paid for travel, to document sales and manage inventory. The major functions of an electronic ticket of the railway are quite similar to the major functions of the airline ticket. On the other hand, area tickets like flight tickets, they are superior for selling online because of their fulfillment costs. Customers search the web for particular shows in order to get

tickets. E-ticket signify additional and comfortable tool for passengers, saving of time spent on the purchase of airline tickets, new chance in the full scale encouragement of the web-reservations and the web-purchasing, which represent the most rapidly segment of global market of aviation.

Electronic ticketing is moving forward in popularity, but it has advantages and disadvantages (Parsons, 2000). E-Ticketing is one of the most significant opportunities to reduce costs and improve convenience of travelers. It reduces ticket processing charges, eliminates the need for papers and enables greater flexibility to the travelers and the travel agent to make changes to the itinerary. Other advantages of using electronic ticketing such as the Electronic Ticket can not be lost or stolen. E-Ticketing makes customers' lives easier, and that can make their carrier of choice (Kim et. al, 2001). The most important disadvantages of the E-Tickets for the customers are sometimes happen inefficiency of the technology such as break down of the computer and then some passengers' reservations will be deleted. In this case when this happens the use of paper tickets will be better than E-Tickets. With E-Ticketing customers can reserve tickets they want directly using the internet in this case the workers will loose their works.

According to (Wan & Che, 2004) where it is followed the theory of planned behavior (TPB), that a traveler's intention to use E-ticketing is jointly determined by his or her: (1) positive or negative evaluation on using the technology; (2) perception of relevant people's opinions on use of the technology; and (3) perception of the availability of skills, resources, and opportunities necessary for using the technology. Previous studies has been shown that the behavioral intention to new technology is jointly determined by trust and familiarity as in (Wan & Che, 2004), for travelers as

example who had been using traditional paper tickets for years, switching to E-ticketing would involve much uncertainty of reliability and validity of E-ticketing. A highly uncertain situation can inhibit customers' intentions to use new technology. This kind of uncertainty that perhaps can happen for customers who using traditional paper tickets when switching them to mobile e-ticketing, as can see in section 2.4 mobile commerce.

2.4 Mobile Commerce

Beginning from a world of e-commerce to world of mobility the advances in devices, applications and networking. Mobile commerce (m-commerce) is defined as transaction via wireless device and data connection that results in a transfer of information, services, and/or goods (Jarvenpaa et al 2003) as cite in (Chun & Wei, 2004). It is also an extension of electronic commerce (e-commerce) that allows users to interact with other users and businesses anytime, anywhere; therefore m-commerce and ecommerce have a lot in common since they involve much of the same functionality in terms of facilitating Internet (Coursaris et al 2003) as cite in (Chun & Wei, 2004). From the user's point of view, the most significant difference is the Internet access device. While e-commerce is conducted mainly through desktop computers, m-commerce is facilitated via wireless devices such as PDA, palm, and cell phones, giving the user freedom of mobility.

Cronin 2003 as cit in (Hampe et al., 2004) said “Mobile commerce refers to all data-driven business transactions and exchanges of value by users of mobile devices via wireless telecommunication networks.”, in same study Cronin mentioned that some

studies uses an over simplification of the term “mobile commerce” by stating that it is just “a wireless form of electronic commerce”.

According to (Grosche & Knospe, 2000) the term of e-commerce (electronic commerce) refer to business processes on the internet, such as the buying and selling of goods. As mentioned before there is a distinction between B2B (business-to-busmess) and B2C (business-to-consumer) markets. But the term of m-commerce (mobile commerce) is all about wireless e-commerce, that is, where mobile devices are used to do business on the Internet, either in the B2B or B2C market. As such, m-commerce is a subset of e-commerce. Availability of mobile phones (and other mobile devices), m-commerce services have a promising future, especially in the B2C market. Future applications include buying over die phone, purchase and redemption of ticket and reward schemes, travel and weather information, and writing contracts on the move (Grosche & Knospe, 2000). M-commerce is an extension of E-Commerce to enable the users to interact with other users and businesses at anytime and anywhere. the changing of e-commerce (wired setting) into m-commerce (wireless setting) has been after the wide success of mobile communication, and the mobile devices users (PDAs, and smart phones) are considered as a large group of possible market (Aungst & Wilson, 2005). Mobile commerce is defined as the exchanges or buying and selling of commodities, service, or information on the Internet by using mobile handheld devices (C. w. Lee et al., 2003).

According to (Hampe et al., 2004) there are some main differences which we became especially aware of when designing our prototype, mobile commerce applications can be easily personalized to match individual situations. Unlike electronic commerce where the customers needs a personal computer, a mobile device is easy

for the user and gives its users the ability to transmit urgent information or transactions, this means that one can do business everywhere and at any time. In additional, unlike electronic-commerce device, mobile-commerce device has many limitations such as limited size, limited display window, limited processing power, and low bandwidth (Tarasewich 2003, Lee & Benbasat 2003) as cite in (Chun & Wei, 2004).

Despite the fact that there were some concerns doubts and concerns arose when high hopes and anticipation of m-commerce deflated last few years (Jarvenppa et al 2003, Stafford & Gilleson 2003) as cite in (Chun & Wei, 2004) but the research results in (Chun & Wei, 2004) showed that developing user friendly mobile-commerce framework is crucial to the success of mobile-commerce. As mentioned before that when the user switching from using traditional paper tickets to E-ticketing would involve much uncertainty with highly uncertain situation of E-ticketing, a highly uncertain situation can restrain customers' intentions to use new technology (Wan & Che, 2004). In this context, this work to design and develop mobile e-ticketing system, which means switching users from using traditional paper tickets and E-tiketing to M-tiketing it will be accompanied with other level of uncertainty for users. An international survey done in 2003 clearly delivers the users' hesitation in embracing m-commerce (Jarvenpaa et al 2003) as cite in (Chun & Wei, 2004).

According to (Chun & Wei, 2004), survey shows that the mobile's users are mostly worried about the limited functions of cell phones and PDAs, limited number of services offered by the providers, and the difficulty maneuvering within the limited size of the mobile devices. Uncertain technology standards, the complexities of interactive applications, and the threat of governmental regulations have contributed to the disappointing spread of mcommerce, too (Jarvenpaa et al 2003, Lee &

Benbasat 2003) as cite in (Chun & Wei, 2004), A considerable amount of attention should be given to user friendliness of mobile-commerce framework to ensure a successful venture of mobile-commerce. Moreover, not only the technical aspects of mobile-commerce but also social and psychological aspects of the mobile-commerce customers should be studied in depth for mobile commerce to be incorporated into the every day businesses of the world. Clearly, the ease of operation, the convenience, and the user-friendliness of mobile devices must be one of the top priorities for developers and makers of mobile devices.

The M-Commerce different from the E-Commerce in that the Internet access will be done using mobile devices such as PDA (Personal Digital Assistant) and the hand phones. M-Commerce is a technology that provides commerce anywhere and anytime. The users' needs motivated to switching the information that was available to the user in E-commerce environment to be available in M-commerce environment. the M-commerce differs from the E- Commerce in that the Internet access will be done using mobile devices such as PDA (Personal Digital Assistant) and the hand phones. M-Commerce is a technology that provides commerce anywhere and anytime. (DZNet, 2007) defines M-Commerce as the using of smart phones and handheld computers with wireless connections to place orders and transact business over the Web.

According to (C. w. Lee et al., 2003) It is estimated that 50 million wireless phone users in the United States will use their hand-held devices to authorize payment for premium content and physical goods. This represents 17% of the projected total population and 26% of all wireless users. Many major companies have begun to offer mobile commerce options for their customers in addition to the electronic commerce they already provide.

Differences to E-commerce

In comparison to e-commerce. M-commerce offers both advantages and disadvantages. The following list summaries the advantages of m-commerce (T. Weitzel) as cite in (Grosche & Knospe, 2000):

- Ubiquity - (the end user device is mobile, that is, the user can access m-commerce applications in real time at any place.
- Accessibility - accessibility is related to ubiquity and means that the end user is accessible anywhere at anytime. Accessibility is probably the major advantage by comparison with e-commerce applications involving a wired end user device.
- Security - depending on the specific end user device, the device offers a certain level of inherent security. For example, The SIM card commonly employed in mobile phones is a small card that stores confidential user information, such as the user's secret authentication key. As such, the mobile phone can be regarded as a smart card reader with smart card.
- Localisation - a network operator can localise registered users by using a positioning systems, such as GPS, or via GSM or UMTS network Technology, and offer location- dependent services. Those services include local information services about hotels, restaurants, and amenities, travel information, emergency calls, and mobile office facilities.
- Convenience - the size and weight of mobile devices and their ubiquity and accessibility makes them an ideal tool for performing personal tasks.
- Personalisation - mobile devices are usually not shared between users. This makes it possible to adjust a mobile device to the user's needs and wishes (starting with the mobile phone housing and ringtones). On the other hand, a

mobile operator can offer personalised services to its users, depending on specified user characteristics (e.g. a user may prefer Italian food) and the user's location (see above).

The following list summarises the main disadvantages of M-commerce (Grosche & Knospe, 2000):

- Mobile devices offer limited capabilities such as limited display. Between mobile devices these capabilities vary so much that end user services will need to be customised accordingly.
- The heterogeneity of devices, operating systems, and network technologies is a challenge for a uniform end user platform. For this reason, standardisation bodies consisting of telecommunication companies, device manufacturers, and value-added service providers integrate their work. For example- many current mobile devices implement an IP stack to provide standard network connectivity. At the application level, the Java 2 Micro Edition (J2ME) offers a standardized application platform for heterogeneous devices.
- Mobile devices are more prone to theft and destruction. According to a government report, more Than 700000 mobile phones are stolen in the UK each year. Since mobile phones are highly personalised and contain confidential user information, they need to be protected according to the highest security standards.
- The communication over the air interface between mobile device and network introduces additional security threats.

Structure of a mobile commerce system

(C. w. Lee et al., 2003) said "Compared to an electronic commerce system, a mobile commerce system is much more complicated because components related to mobile

computing have to be included, mobile commerce system involves a range of disciplines and technologies", also said "This level of complexity makes understanding and constructing a mobile commerce system an arduous task". (C. w. Lee et al., 2003) presented the structure of a mobile commerce system, which consists of six components as in Figure 2.3, and summarized these components as follows:

- **Mobile commerce applications**: Electronic commerce applications are already broad. Mobile commerce applications not only cover the existing applications, but also include new applications, which can be performed at anytime and from anywhere by using mobile computing technology
- **Mobile stations**: Mobile stations are limited by their small screens, limited memory, limited processing power, and low battery power, and suffer from wireless network transmission problems. Numerous mobile stations, such as PDAs or Web-enabled cellular phones, are available in the market, but most use one of three major operating systems: Palm OS, Microsoft Pocket PC, and Symbian OS. At this moment, Palm OS leads the market, however it faces a serious challenge from Pocket PC.mobile
- **Mobile middleware**: WAP and i-mode are the two major kinds of mobile middleware. WAP is widely adopted and flexible, while i-mode has the highest number of users and is easy to use. It is difficult to predict which middleware will dominate the market in the future; it is more likely that the two will be blended somehow at some point in the future.
- **Wireless and wired networks**: Wireless LAN, MAN, and WAN are major components used to provide radio communication channels so that mobile service is possible. In the WLAN category, the WiFi standard with 11 Mbps

throughput dominates the current market. It is expected that standards with much higher transmission speeds, such as IEEE 802.11a and 802.11g, will replace WiFi in the near future. Compared to WLANs, cellular systems can provide longer transmission distances and greater radio coverage, but suffer from the drawback of much lower bandwidth (less than 1 Mbps). In the latest trend for cellular systems, 3G standards supporting wireless multimedia and high-bandwidth services are beginning to be deployed. WCDMA and CDMA2000 are likely to dominate the market in the future.

- **Host computers**: Host computers produce and store all the information needed for mobile commerce applications, and most application programs can be found here. They include three major components: Web servers, database servers, and application programs and support software.

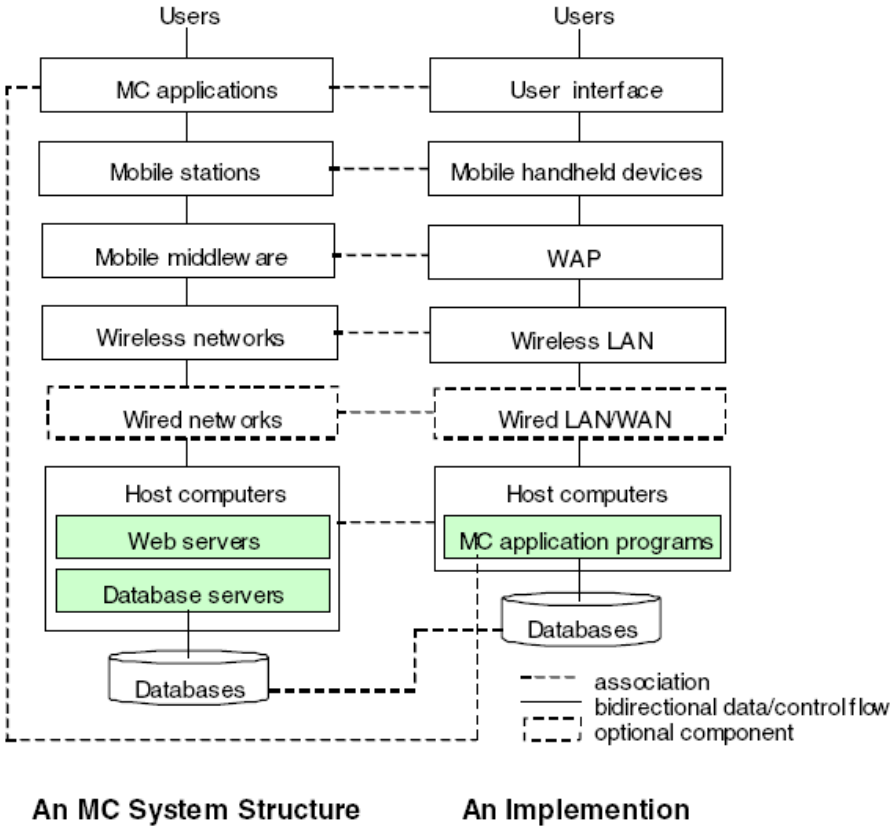


Figure 2.3: A mobile commerce system structure (C. w. Lee et al., 2003)

Mobile commerce applications:

According to (C. w. Lee et al., 2003) too, the applications of electronic commerce are already widespread; For example, some tasks that are not feasible for electronic commerce, such as mobile inventory tracking and dispatching, are possible for mobile commerce. Table 2.1 list some of the major mobile commerce applications

Table 2.1: Major mobile commerce applications (C. w. Lee et al., 2003)

Mobile Category	Major Applications	Clients
Commerce	Mobile transactions and payments	Businesses
Education	Mobile classrooms and labs	Schools and training centers
Enterprise resource planning	Resource management	All companies
Entertainment	Music/video/game downloads	Entertainment industry
Health care	Patient record accessing	Hospitals and nursing homes
Inventory tracking and dispatching	Product tracking and dispatching	Delivery services and transportation
Traffic	A global positioning, directions, and traffic advisories	Transportation and auto industries
Travel and ticketing	Travel management	Travel industry and ticket sales

2.5 WAP (Wireless Application Protocol)

WAP is the latest technology that links the wireless devices to Internet the emerging technology behind M-Commerce is based on WAP. WAP is a specification for a set of communication protocols to standardize the way that wireless devices, such as mobile telephones can be used for Internet access, including e-mail, the WWW, newsgroups, and instant messaging (Computing, 2005).

WAP is an open global specification that allows mobile users with wireless devices to easily access and interact with information and services instantly (C. w. Lee et al., 2003). WAP is an open protocol for wireless multimedia messaging. WAP allows the design of advanced, interactive, and real-time mobile services, such as mobile banking or Internet-based news and travel services (I. LEE, 2002). Backed by the entire telecommunication industry (through the WAP forum), coupled with the fact that it combines two of the hottest innovations - mobile phone and the Internet (Mackenzie and O'Loughlin 2000) as cite in (TEO & POK, 2003).

The results of study in (TEO & POK, 2003) showed that respondents expressed significant interests as evident by the high mean scores over the following WAP services: buying concert/cinema tickets online, receiving appointment reminders, personalised news, personalised traffic updates based on user's preferred commuting route and global news update.

According to (C. w. Lee et al., 2003) WAP is a very flexible standard including most wireless networks, which include CDPD, CDMA, GSM, PDC, PHS, TDMA, FLEX, ReFLEX, iDEN, TETRA, DECT, DataTAC, Mobitex, and GRPS.It is supported by most operating systems and was specifically engineered for mobile stations include Palm OS, EPOC, Windows CE, FLEXOS, OS/9, and JavaOS. The most important technology applied by WAP is probably the WAP Gateway, which is mainly responsible for interfaces between the Internet and the network.

Internet protocols are not designed to operate efficiently over mobile networks. Figure 2.4 show the internet architecture. Standard HTML web content cannot be displayed fully on the small-size screens of wireless devices, pagers, and mobile phones. WAP addresses these issues nicely. WAP is a license-free wireless protocol

standard that can bring data information and telephony services to wireless devices (I. LEE, 2002).

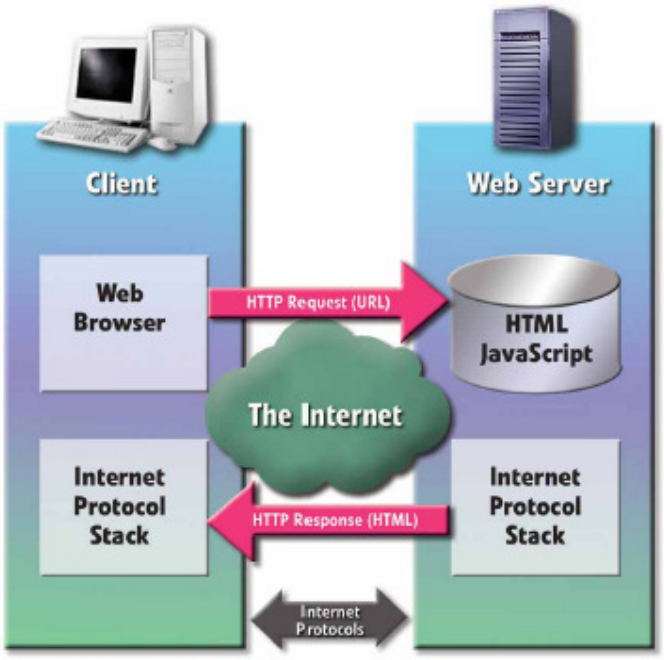


Figure 2.4: The internet architecture (TM)

WAP, the standard developed by the WAP forum, adapting to the restrictions of the wireless network. WAP interfaces with different entities through the use of a gateway/proxy and a set of lightweight data presentation/formatting scripts. Such scripts allow information to be formatted in such a manner that is suitable for transmission over wireless and for presentation on a small wireless device with limited display capability (I. LEE, 2002).

The WAP network architecture (see Figure 2.5) sets up a session using these steps as came in (Kumar, Parimi, & Agrawal, 2003).

1. A mobile telephone sends WAP requests to a WAP gateway.

2. The gateway, upon receiving a WAP request, sends an HTTP request to a plain Web server, which provides the content through a normal HTTP response (the Web server perceives the gateway as a proxy server).

3. The gateway converts the HTTP response into a WAP response for the mobile device.

4. The microbrowser in the mobile terminal interprets the response and displays it appropriately.

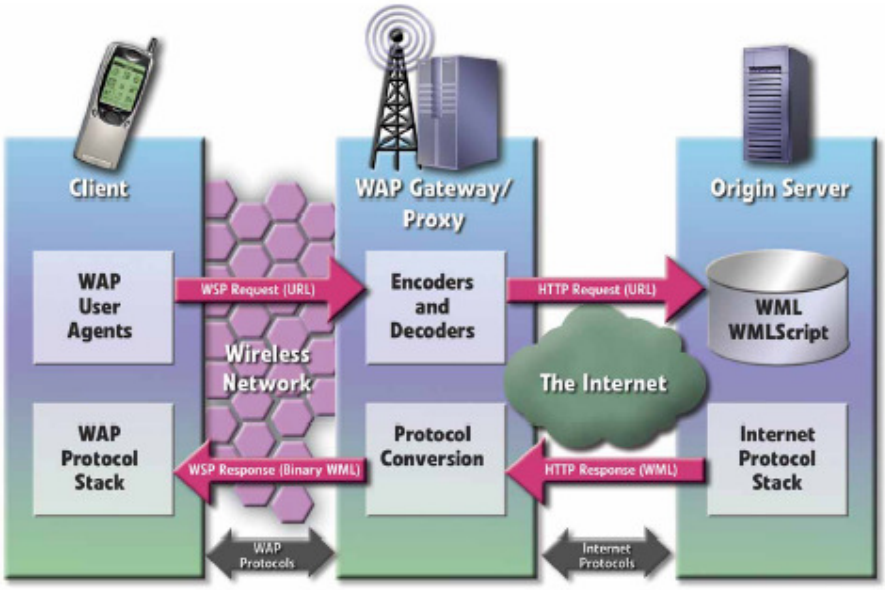


Figure 2.5: A Wireless Application Protocol WAP network architecture (Kumar et al., 2003 ; TM)

The key features provided by WAP include (I. LEE, 2002)::

- A programming model similar to the Internet
- Wireless Markup Language(WML)
- WMLScript
- Wireless Telephony Application(WTA)
- Optimized protocol stack

The WAP is similar to a Web model see Figure 2.6, and the operates as came in (Group, 1999; I. LEE, 2002) as follows:

1. The user selects an option on their mobile device that has a URL with WML content assigned to it.

2. The phone sends the URL request via the phone network to a WAP gateway, using the binary encoded WAP protocol.

3. The gateway translates this WAP request into a conventional HTTP request for the specified URL, and sends it on to the Internet.

4. The appropriate Web server picks up the HTTP request.

5. The server processes the request, just as it would be any other request. If the URL refers to a static WML file, the server delivers it. If a CGI script is requested, it is processed and the content returned as usual.

6. The Web server adds the HTTP header to the WML content and returns it to the gateway. 7. The WAP gateway compiles the WML into binary form.

8. The gateway then sends the WML response back to the phone.

9. The phone receives the WML via the WAP protocol.

10. The micro-browser processes the WML and displays the content on the screen.

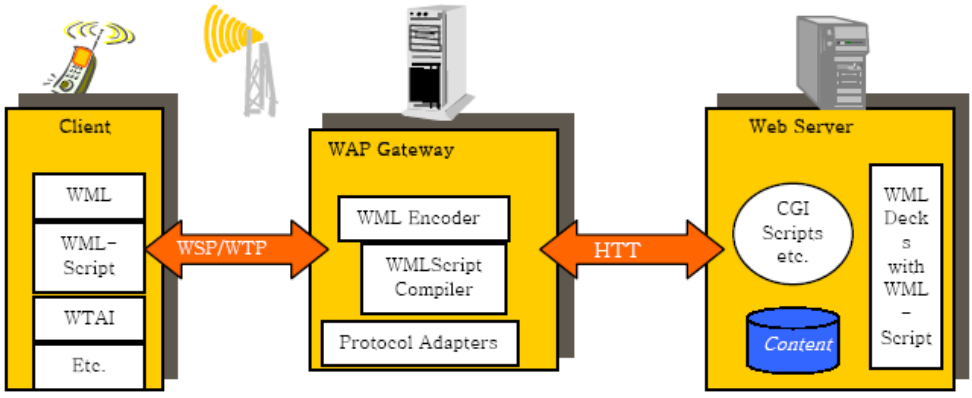


Figure 2.6: The WAP Network Protocol Model Structure (Group, 1999; I. LEE, 2002)

WAP Layers:

The WAP protocol stack has five layers: application, session, transaction, security, and transport. Each layer performs almost the same functions as the corresponding layers of the Internet model. Figure 2.7 shows the WAP layer stack, which consists of the following (Kumar et al., 2003)::

- Wireless Application Environment (WAE): The environment for wireless applications represents an interface to the client device. It embraces the tools that the wireless Internet content developers utilize. These tools include WML and WMLScript, which is a scripting language used in combination with WML.
- Wireless Session Protocol (WSP): WSP provides two session services; they are:
  - Work with WTP to provide connection oriented service.
  - Connectionless service that provides above WDP.
- Wireless Transaction Protocol (WTP): This protocol organizes the traffic. It also classifies the request of the transaction into three classes, the reliable two-way, reliable one-way, and unreliable one-way.
- Wireless Transport Layer Security (WTLS): WTLS is an optional layer. It related to the security, data integrity and the user authentication. And this will be important for some applications like WAP-banking.
- Wireless Datagram Protocol (WDP): WDP manage the transmission and makes it easy to adapt WAP to a diversity of bearers (network carriers) from the network layer.

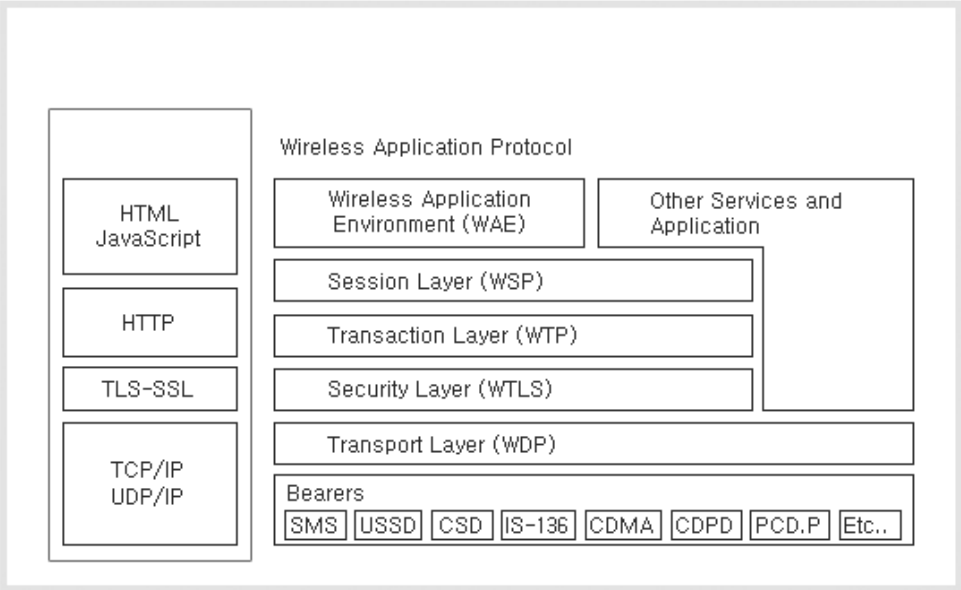


Figure 2.7: The five Wireless Application Protocol layers (Kumar et al., 2003).

Findings in (I. LEE, 2002) showed that the Internet activities respondents are less enthusiastic in shopping online using a fixed terminal such as PC. In contrast, respondents expressed their willingness to buy concert/cinema tickets using a WAP-enabled mobile phone. One possible explanation could be that the decision to watch a movie may often be made on an impromptu basis where fixed terminals such as PC may not be readily accessible. Thus, the ability to order tickets anywhere, anyplace and anytime through a WAP-enabled mobile phone makes it the ideal device for such transactions.

2.6 Mobile Ticketing

Mobile ticketing is one of the m-commerce services currently being offered by wireless network operators. It provides a quick and easy way for event promoters to connect with their mobile audience in a secure and convenient environment. Mobile-Commerce ticketing has been extending the ordering of paper tickets on a fixed E-

Commerce site to the mobile channel. According to (Computing, 2005). Mobile ticketing contains many applications such as follows:

- Cinemas, concerts, theaters and museums and stadium.
- Transportation

It is predicted that the year 2010 the business of mobile ticket sales will generate revenues in the area of $63 billion dollars, clearly this is a major industry that deserves a great deal of attention (Pandelidis, 2006).

According to (Chen & Lu, 2004) using m-ticket could reduce the time for waiting and the risk of storing tickets. There are three participants in m-ticket transaction model.

- Consumer even can transfer the message to merchant to request service.
- Then merchants can prepare the service for the consumer in advance.
- The telecom can create new sources of business by cooperate with merchants. Such as the telecom supports network connection service, the Merchant provides the m-com service for issue, and the customer as a user. The m-ticket transaction model has a lot of benefits for consumers and merchants (Chen & Lu, 2004)..

(Tweed, 2001) said “mobile ticketing (m-ticketing) attacks many real problems by providing a way for mobile phone users to buy tickets from their mobile handsets. The implementation of m-ticketing schemes can vary enormously depending on the characteristics of the service and parties involved, with the potential to sell many different tickets types (not just train and car parking tickets, but those for cinemas, theatre, buses and so on). It is perhaps misleading to refer to tickets, as this suggests to many people a physical piece of paper that can be inserted in to barriers or shown to ticket inspectors. Paper tickets are not necessarily required, as long as the parties

involved in a transaction have an agreed method of identifying what has been purchased and how it is paid for".

M-ticketing gives opportunity to provide services on mobile handsets that overcome some of the annoying aspects of the day-to-day things we do, such as queuing for tickets or having to find change at un-attended ticket machines. But could we be just replacing one problem with another? Instead of cursing when I stand in a queue, will I be getting frustrated with my mobile handset? It goes without saying that services need to be very easy to use, not only for technically aware users, but for those of us who don't know the ins and outs of mobile handset functionality.

(Mallat, Rossi, Tuunainen, & Öörni, 2006) Findings suggested that usefulness and benefits of the mobile ticketing service are perceived differently in different use situations and that use situation has a significant effect on use intention. this study results indicate that traditional adoption models should be augmented with the use situation and mobility constructs to better understand and explain the specific factors, which determine the use of mobile services.

(Mallat, Rossi, Tuunainen, & rni, 2008) empirically tested the effect of use context and mobility on mobile ticketing adoption, findings that mobility and contextual elements play a very significant role in the adoption of mobile services and that these two factors should be more closely integrated into the existing adoption models to increase their predictive power. Also in (Mallat et al., 2008) from a managerial point of view, results suggest that the relative advantage of mobile services lies on the ubiquitous service access and on the ability of mobile users to solve different contextual problems such as queuing by using mobile services. in additional findings indicate that mobile service developers should build on the relative advantages of

mobility and contextual responsiveness when developing new mobile services. At the same time, however, the services should satisfy the requirements related to ease of use, compatibility, reliability, and possibly also social esteem or attention to gain wide consumer acceptance.

According to (Pandelidis, 2006) currently there are already a few areas where mobile ticketing exists, The method that is frequently used currently is messages are sent through the SMS (short message service), this however is a less than perfect scenario. While SMS is a fairly universal and well implemented technology, it has its limitations for mobile ticketing. SMS is primarily text and does not have the best implementation for browsing of lists, as might be a list of events one wishes to purchase a ticket to. What is a more realistic option is browsing using a micro browser, would allow users to see WML formatted pages on their mobile that originally oriented on the regular internet.

(Pandelidis, 2006) mobile ticketing has been effective in several parts of the world already, but there hasn't been any sort of large scale implementation as of yet. This study explains this as because of several limitations of the devices that are slowly being overcome; one of these limitations may be the restrictions of WAP. There are several security issues such problems with the WAP gateway and its method of decrypting and then re-encrypting data. many studies to solve and support this issue like the NTT DoCoMo have provide the “Cmode” using the QR-code tech, the HINET is develop the M-ticket using the Bar code tech. Both of two has the same drawback, they can not see the ticket’s content (Chen & Lu, 2004), also there VSS (Visual Secret Sharing) (Chen & Lu, 2004) and TrustZone technology (Hussin, Coulton, & Edwards, 2005). There are problems with physical security (which are far more difficult to solve), there are issues with using the SMS system, and there are

certain problems with the WML library. A lot of these problems have the potential to be solved with the release of WAP 2.0. Finally this study mentioned this is merely a stepping stone to the next step". As PDAs and cell phones become more powerful and have better user inputs they will make it possible to use new ways to connect to the internet. Eventually it is likely that phones will be powerful enough to view HTML pages in their raw form with editing only being done on the receiving end (phone end) to make the page easily visible to the user. This will make mobile ticketing a more realistic option for more people, as more complex searching and authentication methods become available it will being the world of mobile ticketing to more and more people (Pandelidis, 2006).

2.7 Mobile Payments

On the payment, the e-commerce activities in conjunction with through wireless communication terminals and the Internet, is the essence of mobile ecommerce. After mobile users completed business activities by phone, how to resolve their pay, and how to ensure that all relevant agencies of the existence of a win-win situation, the successful completion of payment, and it is an important issue which mobile e-commerce to be considered (Jiang, 2008).

(Me, 2003) "There is almost a knee-jerk response that such a portable means of shopping and payment would be much more convenient than traditional cash-based or card -based methods", also with (Me, 2003) one of new mobile applications, possibly relying on mobile payment, is represented by mobile ticketing, this study followed the definition of ticket that is a proof of access/usage rights to particular service and mobile ticketing is its electronic realization with the help of mobile

device. Potential applications of' this service include transportation (flights, trains, boats, ferries, buses, trams), events (Concerts, theatres, fairs, museums, sports events), facilities (Gyms, solariums). It is mentioned that mobile ticketing is mainly composed of building blocks: mobile ticket provider application and payment system facility relying on. The payment choice mainly depends on payment size and expected target client mobile equipment.

According to (Jiang, 2008) mobile e-commerce payments can be classified into many unique types, a typical categories include: According to the amount paid Classification (micro-payment, little-payment, macro-pay, etc.), According to the locations of transaction object classification (remote payment, face-to-face payments, family payments, etc.), in accordance with the payment of the time Classification (pre-payment, on-line real-time payment, off-line credit payment, etc.), in accordance with the object of payment of the purchase classification (small pieces of commodities, stocks and shares, lottery tickets, instant messaging, customer service, on-line connection time, etc.), in accordance with billing units of the payment classification (Pay-Per-Time, Pay-Per-View, Pay-Per-Page, Pay-Per-Click, Pay-Per-Quality, Pay-Per- Bullet, Pay-Per-Product, Pay - Per-Service).

Wide study has been done in (K.B & Agarwal) has been provided a better understanding on the issues that affect the uptake of a Mobile Payment Solutions(MPS), by identifying and detailing the six factors which govern the success of MPS, where it consider as a valuable starting point for research work in mobile payment area, these six factors are:

- Current Payment Relationships :(who are the competitors, their strengths and weaknesses)

- Payment Scenarios: (where the customer can use the solution)
- Suitability: (if the customer is ok with the solution)
- Ubiquity: (if everybody can use the solution and if they can use it anywhere)
- Regulatory and Security Concerns: (security and regulatory issue)
- Market segmentation: (defining and targeting the correct audience)

This study has clearly explained these factors, and gave the advantages and disadvantages for each one.

Security payment technology of mobile ecommerce as came in (Jiang, 2008)

1. The direction payment based on electronic accounts: This model is the early e-commerce model. Its way is from the bank to pay the electronic accounts and electronic passwords corresponding to user bank account number, user complete certain online transactions through accounts electronic, electronic password is from the bank to verify, trading funds are deducted from the bank account.
2. Pre-payment: In this mode, mobile users to use call fees stored as a means of payment in the trading. Call fees can be stored by regular payment cards. This approach is based on the user has full confidence to mobile operators, mobile operators completed a course of dealing with businessmen as agents of the users credentials. Pre-payment need mobile operators a support transactions agent platform for mobile users, and need a complete and open mobile users pre-payment management system.
3. Micro-Payment: Micro- payment as a form of electronic cash payment, is a new direction of the electronic payment for development. Micro-payment is a new e-commerce payment method relative to Macro-Payment, under

condition with meeting the security, simple and efficient, and every transaction volume of transactions is very low. At present, some research institutions and companies propose various forms of micro-payment mechanisms to meet the different needs of safety and efficiency (Xia Guoping, Zhang Tieshang, 1994) as cite in (Jiang, 2008).

4. Credit card payment: Reliable and valid credit card online payments through a combination of ICT and password technology are mainly in the following two ways:
    a) Account direct transfer. This approach requires customers to transfer credit card numbers directly to merchants, credit card numbers information is with encryption by the agreement WTLS The method only applies to credit cards, but also for businessmen must be in good standing.
    b) Dedicated account manner. After merchants verify the customer's bank cards identity, and establish a virtual account corresponding bank cards, including independent account numbers and passwords for it, customers payments through virtual account, account number and password encryption by WTLS agreement. The approach provides higher security, but the building process more complicated.

2.8 Summary

Many studies have been done in the electronic commerce, electronic ticketing, mobile commerce, WAP, mobile ticketing and mobile payment. As contents, factors, advantages, disadvantages, adoption and fears etc... Some studies was discussed clearly, but others still tackling an area full of forecasts, assumptions and sometimes

speculations. Although E-Ticketing is preferred by many customers to do their ticketing reservation, it is still not a perfect system because of some limitations. This chapter has discussed the electronic commerce, electronic ticketing, mobile commerce, WAP, mobile ticketing and mobile payment. The next chapter will discuss the methodology of the research.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The research methods refer to the methods and techniques used by the researcher in performing the research, for example data collection technique, data processing techniques and instruments. There are several ways to carry out research, and depending on the goal of the study it is common to use either a descriptive or a prescriptive approach in information technology research (March & Smith, 1995) as cite in (Egeberg, 2006). Descriptive research seeks knowledge about the nature of reality whereas prescriptive research, also known as design science, seeks to improve the performance of a task or system (Egeberg, 2006).

The research methodology used in this study is an agreeable method, excellently chosen, described and accepted among many researchers in information system, it is Research Design (Vaishnavi & Kuechler, 2004), design research involves the analysis of the use and performance of designed artifacts to understand, explain and to improve the behavior of some aspects of information system (Vaishnavi & Kuechler, 2004). (Khosrowpour, 2006) has been used design research approach depending on (Vaishnavi & Kuechler 2005), and it is mentioned that is because "its

address important unsolved problem in unique of innovation way or solve problem in more effective of efficient ways" (hevener et al. 2004) as cite in (Khosrowpour, 2006), Also (Cater-Steel & Al-Hakim, 2008), (Järvinen, 2005), (Ardakan & Mohajeri, 2009) and many others has been follow the design science research that presented Vaishnavi & Kuechler 2004, 2005, 2008.

I adapt my research methodology based on study by Vaishnavi & Kuechler (2004), the design research methodology includes the major steps as shown in Figure 3.1 these phases are:

- Awareness of Problem
- Suggestion,
- Development
- Evaluation
- Conclusion.

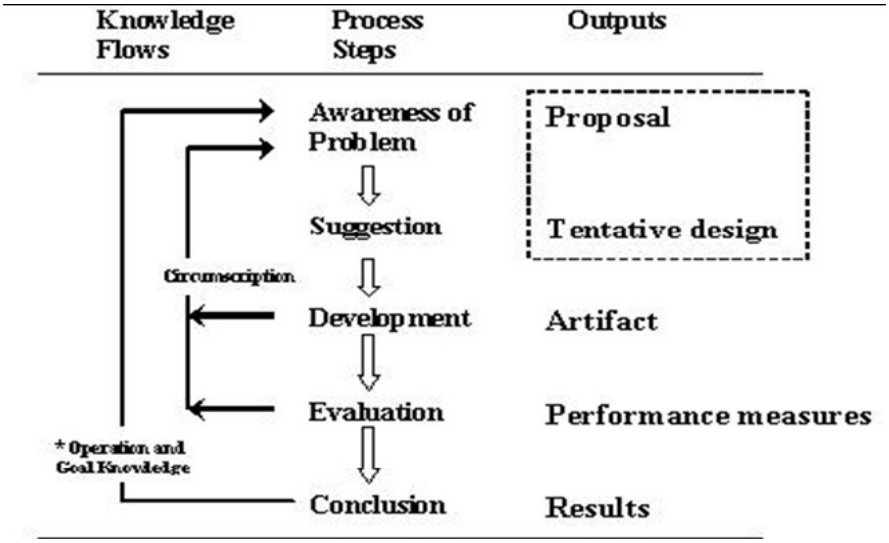


Figure 3.1: Research Design Methodology (Vaishnavi & Kuechler, 2004)

3.2 Awareness of Problem

This stage is the most important thing in the study, to understand the problems which we are trying to solve. In this stage we collected data through the study current process of ticketing for Kedah's cinemas. To awareness and identify the problem that the interaction is not efficient between users and cinemas. Therefore, the awareness of the problem rises because of the need to reserve cinemas of Malaysia using mobile devices any where any time. After that the problem statement, objective and the scope will be clear.

This stage methodology is usually done through a series of focused inquiries and discussion with business management and expected users. These analyses initiate the process of development by establishing a mutual understanding of the objectives, scope, user needs and assess the feasibility of developing the project.

3.2.1 Collect Data*:* Collection of the data has been done through an observed the current system, fast interview with manager of cinema of Alor Satr Mall, and inquiries/discussion with users.

3.2.1.1 The current Process of Ticketing:

This study dealing with a group of cinemas of kedah and there is no central system process for all these cinemas, therefore the current system is different from the cinema to other. Generally all cinemas have the traditional way to book a ticket for watching movie that it is a manual process.

With regard to the online services "electronic-ticketing" not all these cinemas owns this service, and those that have such a online service it also is not on the same format, one of which allows the users to reserve tickets but without the payment ticket's amount therefore the users must come to the box office to confirm and pay of tickets before two hours of the movie screen, otherwise, the user can not ask for the ticket. Other option those that have such a online service can allow user to pay through the credit card or any electronic payment method but with some limitation of the number of tickets.

3.2.1.2 Cinemas Details

List of cinemas names of Kedah with their places:

Alor Star : SSC Alor Star

Alor Star : Metrowelth Alor Setar

Jitra : Jitra Mall Cineplex

Langkawi : Mega Cineplex Langkaw

Center Square, Sungal Pentani : GSC Sg Petani

3.3 Suggestion

The suggestion of this study is by using mobile ticketing application prototype, This prototype will be in two parts, the first part it will be the web application service which will serve as a central system for the management of kedah's cinemas to avoiding the different situations of cinemas, the second part it will be the wap application service to enable customers to easily access and getting the cinema's ticket through mobile phone. That enhance interact between users and cinema, and

make it more easy to use. The output of this phase is the temporary design; the design of the system includes UML diagrams. The UML diagrams are general use case diagrams, detailed sequence diagrams for each use case, and class diagrams.

Analysis: To facilitate the design, the requirements of application will analyze and design by UML diagrams framework this temporary design helpful in gaining insight to which behavior and functionality the application should offer. The UML diagrams are general use case diagrams, detailed sequence diagrams, and class diagrams.

3.4 Development

This study going to develops that temporary conceptual design and implements it in web and mobile phone. This migration from temporary design to implementation involves choosing a programming language and an operating environment to deploy the solution. This project will make use of java technology as it is supported by the phone. The Java technology offers a runtime- and programming environment to develop applications, and an increasing number of handsets are supporting the Java technology.

The Java platform seeks to make the application development independent of the underlying hardware and operating system of the device. This makes the applications hardware-and operating system independent, making it easier to develop applications that can be used independent of the handset manufacturer. The platform differs from many other platforms in that it is a software only platform that runs on top of other hardware platforms. The Java 2 Platform consists of three elements (Sun Microsystems) ac cite in (Egeberg, 2006):

- Java programming language.

- Java Virtual Machine (JVM).
- Application Programming Interfaces (APIs).

A program written in Java goes trough two steps in order to run on a hardware platform. First the program has to be compiled into byte code, and this is done by a java compiler. Then in order to run, an interpreter in the java virtual machine has to interpret the byte code into the appropriate machine code. By having java virtual machines for different hardware platforms the java programs do not have to consider which hardware platform it will run on, this will be taken care of by the java virtual machine. This is the idea behind the java vision of "write once, run anywhere". The APIs are code that is already written and ready for reuse trough a well defined interface (Egeberg, 2006). The Java environment has different editions that are available to make Java fit in different environments (Sun Microsystems) as cite in (Egeberg, 2006). J2EE is a standard for the development of component bases enterprise applications; it supports the development and execution of web services. J2SE is a standard for regular server and desktop applications and J2ME micro edition is the standard for applications operating on consumer and embedded devices.

The prototype will be develop in java specifically J2EE (Java 2 Enterprise Edition) plus JSP framework.

3.5 Evaluation

The evaluation will conduct after developing of application, it will test by running the system and check the service through the interview and questionnaire by beneficiaries (users and cinema office) then checking the result that collect through

the questionnaire and analyze by using SPSS software to get clear performance measurement. Also check the usability of application where the usability can serve as a link between the consumers' capabilities and requirements and the designers' blueprint.

3.5.1 Usability: Usability is refers many definitions, a quality attribute that assesses how easy user interfaces are to use (Nielsen, 2003).The word "usability" also refers to methods for improving ease-of-use during the design process. It is the combination of fitness for purpose, ease of use, and ease of learning that makes a product effective (Kushner, 2003) as cite in (Hrabe & Gazda, 2004).

Usability is defined by five quality components as presented in (Nielsen, 2003):

- **Learnability**: How easy is it for users to accomplish basic tasks the first time they encounter the design?
- **Efficiency**: Once users have learned the design, how quickly can they perform tasks?
- **Memorability**: When users return to the design after a period of not using it, how easily can they reestablish proficiency?
- **Errors**: How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
- **Satisfaction**: How pleasant is it to use the design?

3.5.2 Questionnaire

The study will distributed questionnaires to public people and an interview with the manager of one of keda's cinemas. The format of the questionnaire will be multiple choice questions, and the sample of the questionnaire attached in appendix C

3.6 Conclusion

This phase is the latest step in the research effort. Results will be compiled and lead to further work, which can combine with this application to the overall mobile ticket for kedah's cinemas.

3.7 Summary

This chapter discussed the methodology used in this study, where the methodologies are grouped under four phases were based on the draft

The objectives as follows:

1. Awareness of the problem Phase
2. Suggestion Phase
3. Development Phase
4. Evaluation Phase

In **Awareness of the problem Phase**, ideas, information, issues and problems related to this study.

In **Suggestion Phase,** the main focus of requirements analysis, the output of this phase is the temporary design.

In **Development Phase,** migration from temporary design to implementation by using J2EE (Java 2 Enterprise Edition) plus JSP framework.

In **Evaluation Phase,** System will be tested and the problem encountered will be analyzed to ensure it will provide correct services.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter introduces system design and implementation of the mobile e-ticketing reservation for Malaysia's cinemas prototype MTMC, those two phases of the methodology that it mentioned before, this chapter will start with system design phase as well as specifying system requirements, then the implementation phase with the designing of the user interface of the prototype.

4.2 Proposed System

The proposed system in this study is to designing and developing mobile e-ticketing reservation for malaysia's cinemas prototype MTMC. This prototype contains two parts, web application service and wap application service. As mentioned before the web application to make ability to manage cinemas and the wap application to give the user the possibility of booking by using mobile phone. This prototype will be host and directed by the mobile company telecommunications as new service to the users.

4.3 System Requirements

The first step is should be explore the requirements of the system, where the system requirements are the start key and foundation upon which systems are constructed.

4.3.1 Functional Requirements

Functional requirements are intended to capture the anticipated behavior of the system. There are several functional requirements to the proposed system. The system consists of two users: administrator for each cinema and customers, the users will interact with the system through interfaces. As well as the requirements appear it based on the users interface. Table 4.1 summarizes the functional requirements for the system and gives a brief description of the different requirements.

Table 4.1: List of functional requirements

No	Requirement Description
	Administrator
1	Administrators need to login first.
2	Administrators can (Add, Delete, Update, View) cinema's movies.
3	Administrators can (Add, Delete, Update, View) Advertisement.
4	Administrator can view booking information.
5	Administrator can view customer information.
	Customer
6	Customer can register through mobile phone
7	Customer need to login first.
8	Customer can make booking
9	Customer can view his/her ticket information
10	Customer can view his/her profile
11	Customer can view his/her balance

4.3.2 Non Functional Requirements

The non-functional requirements try to capture properties of the system that has to do with performance, quality or features that are not fundamental for the system to work. They are however very important because they are often properties that highly desired by the user and can help the system gain competitive advantage over other systems. The list of the nonfunctional requirements for the system as follow:

- Secure data handling: The data has to be stored in a way that they can not be compromised.
- User friendly: The graphical user interface has to be easy to understand.
- Reliability: Availability of the system, rate of failure occurrence very low.
- Speed: The system will increase the speed of all daily activities.
- Navigation: The system offering the opportunity to go to other parts of the application.
- Help & Support: Support workflow in the system and support the user to fulfill their missions.
- Error handling: Errors are avoided as much as possible.

4.3.3 Hardware Requirements:

High quality hardware in (CPU, RAMS, Hard Disk, etc...).

4.3.4 Software Requirements:

Operating System: Microsoft Windows XP Professional.

Database Server: MySQL and streamlines DB Administrator with Navicat 2004.

Program Language: The Java Programming language with JCreator editor

Web Server: The Apache Jakarta Tomcat 5.5 Servlet/JSP Container

Phone Emulator: Pocket PC Browser

Apache is "The Apache Software Foundation" - an umbrella organization that looks after a number of Open Source projects. Jakarta is the group name for the Java based projects of the Apache Software foundation. Tomcat is a Web Server that handles server side Java (in the form of Servlets and JSPs), and it's a part of the Apache Jakarta project group. Tomcat is the "reference" implementation of the Servlet and JSP standards - in other words, if it runs under Tomcat, it should run under any compliant Servlet / JSP container (Ellis, 2003).

4.4 System Design

System design is the activity of proceeding from an identified set of requirements for a system to a design that meets those requirements (Daintith, 2009), therefore the first step is should be explore the requirements of the system, where the system requirements are the start key and foundation upon which systems are constructed see section [4.3.1, 4.3.2]. Temporary design follows the proposal. This section introduces some scenarios that are meant to better understand the desired behavior of the system.

The design of the system includes UML diagrams, the UML diagrams involved use case diagram, sequence diagrams and class diagram. Sections [4.4, 4.5, and 4.6] illustrate the design of the prototype. Pacestar UML Diagrammer Version 5.07 used to draw the diagrams that will help in the development stage.

4.4.1 Scenarios

The scenarios are a description of the system as seen by a user. It is a non-formal way of describing the system and is helpful in gaining insight to which behavior and functionality the system should offer (Egeberg, 2006). The following scenarios describe how administrator and customer would use a MTMC. This will help to gain insight in the problem domain and elicit requirements the system has to meet.

4.4.1.1 Director of MTMC Prototype

This MTMC prototype is like an introduction service by the communications of mobile company, this service is hosting by communication's server to make domain to both of system's parts (the web part for cinema's administrator and the wap part for customer's access for booking).

4.4.1.2 Administrators of Cinemas

Administrator of the cinema will enter the web site through its own ID and password, then the system will check the authorization of manager entry, after that the manager will be enable to complete the tasks of cinema such as add, delete etc. and so on, all managers will have been admitted all the special data of their cinema, then all these data (movies) will be available for customer.

4.4.1.3 Customers Access and Booking Electronic Mobile Ticket

The customer wants to start using the mobile phone for electronic ticketing. The customer has to access to the wap domain address, if the customer is new he/she can make new registration, then he/she can make login through their own ID and password, if the login was successful , the customer will be able to complete tasks,

the main task is booking ticket. Now the customer can browsing and selects his/her destination and sees the available movies and obtains his/ her ticket.

4.4.1.4 Buy and Using Electronic Ticket

Because the customer already using his/ her phone number and this number will be same the ID using in login as the registration condition, the mobile phone company will adopt a the process of pay to cinema's company by deducting the amount of the ticket from customer's balance. The prototype provide to the customer the ability to display the ticket's information anytime, then the customer only need to present his/her ticket on mobile phone near the cinema box office to check the ticket and then enter the movie.

4.5 Use Case diagrams

The use cases are more formal methodology means to show how the functionality the system offers meet some need of the user. They are not meant to indicate how the communication between participants of the system is, but rather a tool to identify the functionality the different actors have to offer (Egeberg, 2006).

According to the use case diagrams that shown in figures [4.1 and 4.2]. The system has two main components (actor/user) administrator and customer. Both of them have to login to system by his/her user ID and password. The administrator in this system will manage all cinema and advertisement and view booking and customer profile. The customers able to booking view his/her ticket information, view balance and profile.

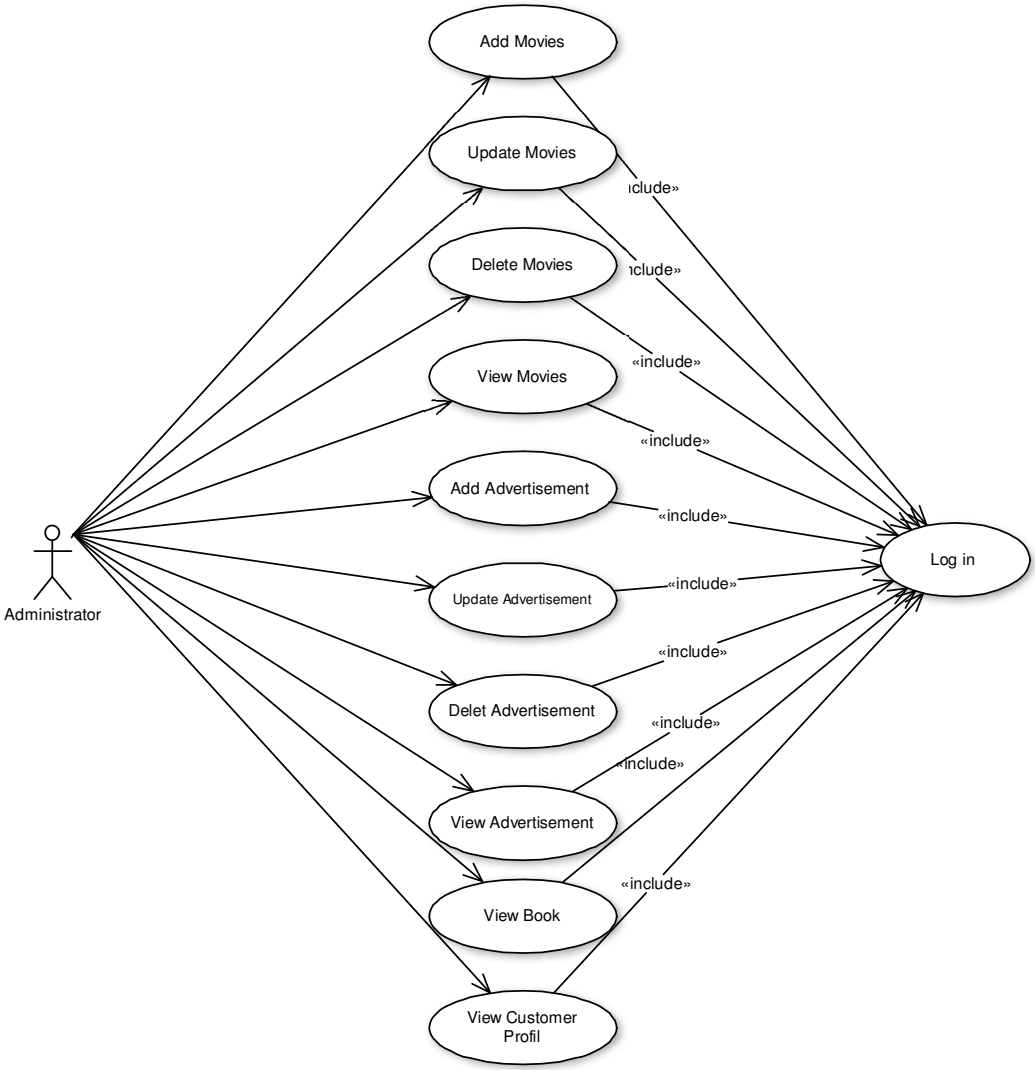


Figure 4.1: Administrator Use Case diagrams (web's part)

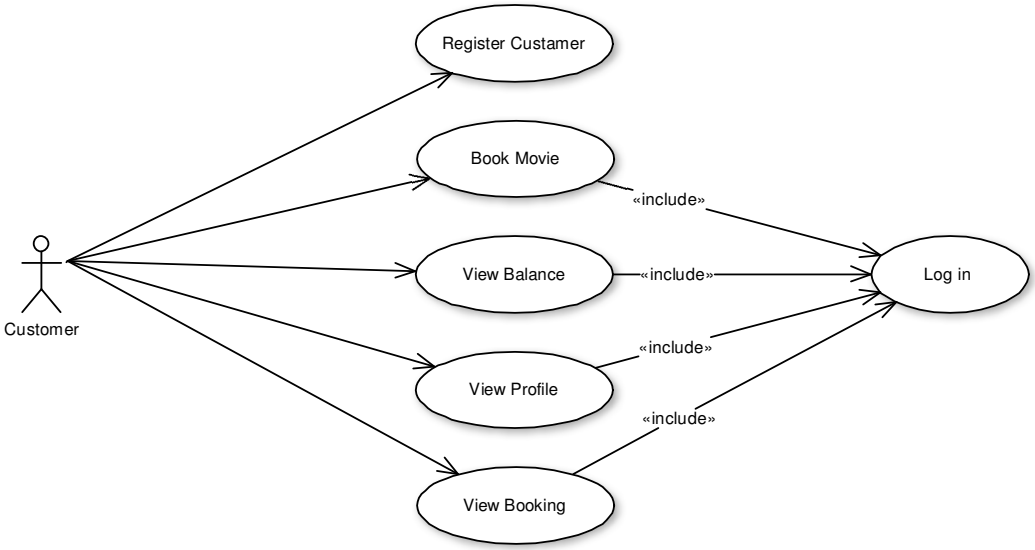


Figure 4.2: Customer Use Case diagrams (Wap's part)

4.6 Use Case Specifications

The whole use case specifications attached in appendix A

4.7 Sequence Diagrams

For more information on the various use cases, refer to the sequence diagram of each Use case:

Admin Login Sequence Diagram:

In this sequence diagram as in figure 4.3, the administrator can access his/her pages by login his/her account through the username and the password.

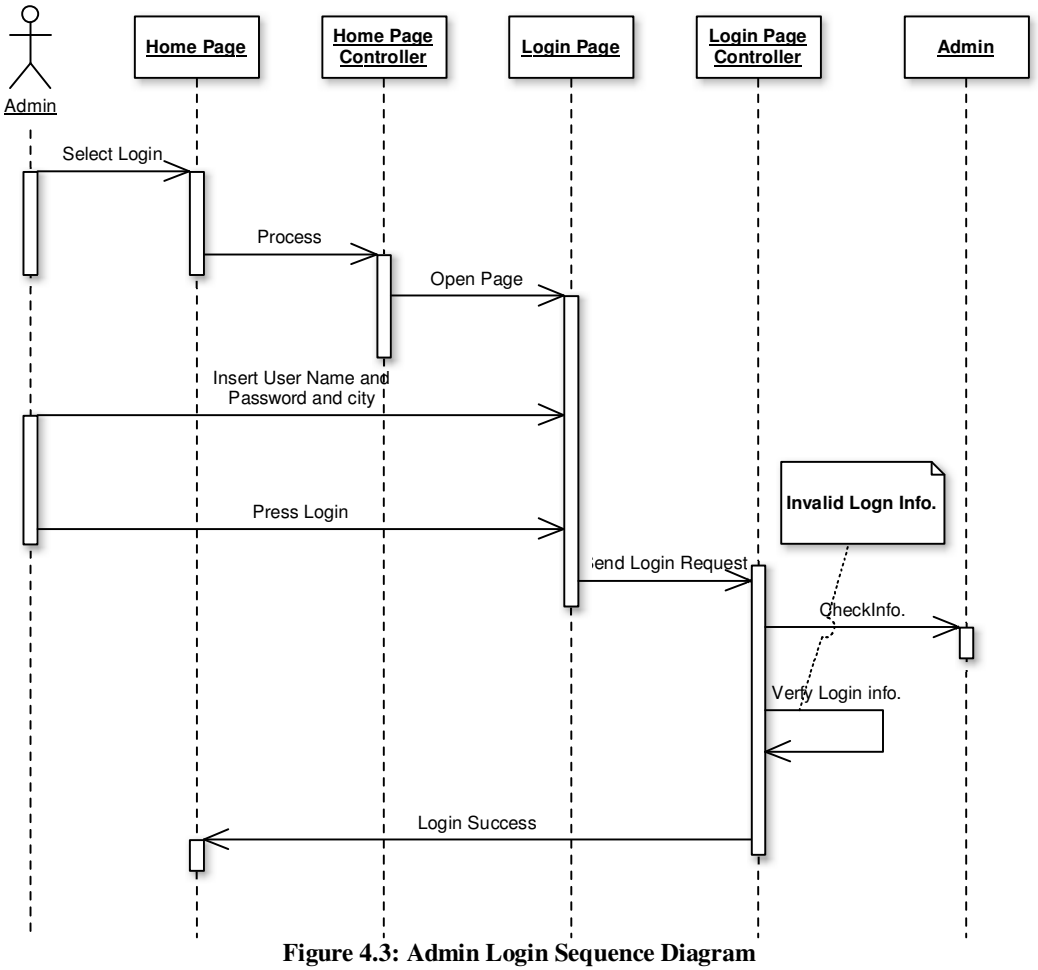


Figure 4.3: Admin Login Sequence Diagram

Customer Login Sequence Diagram:

In this sequence diagram as in figure 4.4, the customer can access his/her pages by login his/her account through the username and the password.

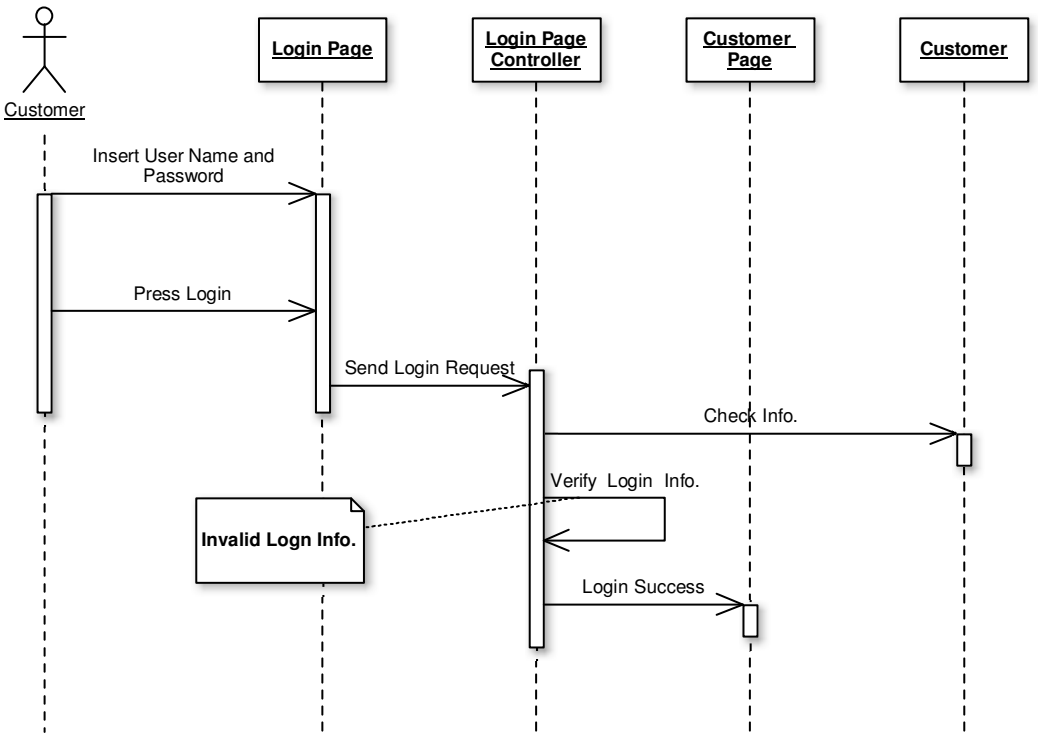


Figure 4.4: Customer Login Sequence Diagram

Add Movie Sequence Diagram:

The administrator in this sequence diagram has the ability to add the movie through the system. Figure [4.5] show when the Admin select add movie and how this process will done.

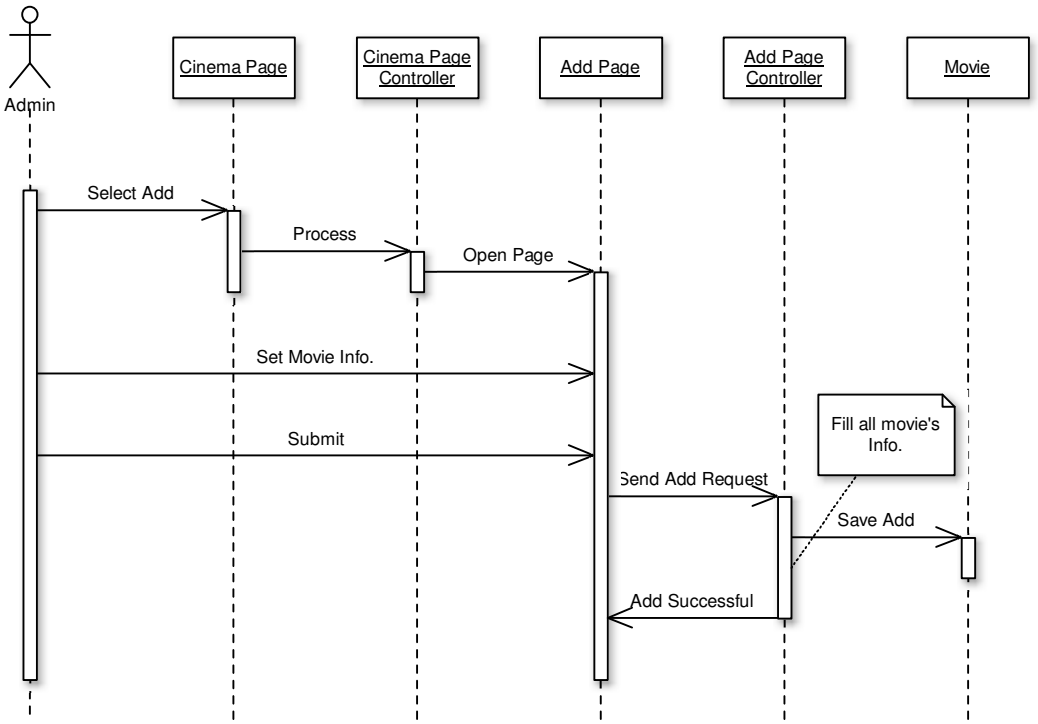


Figure 4.5: Add Movie Sequence Diagram

Delete Movie Sequence Diagram:

The administrator in this sequence diagram has the ability to delete the movie through the system. Figure [4.6] show when the Admin select delet movie and how this process will done.

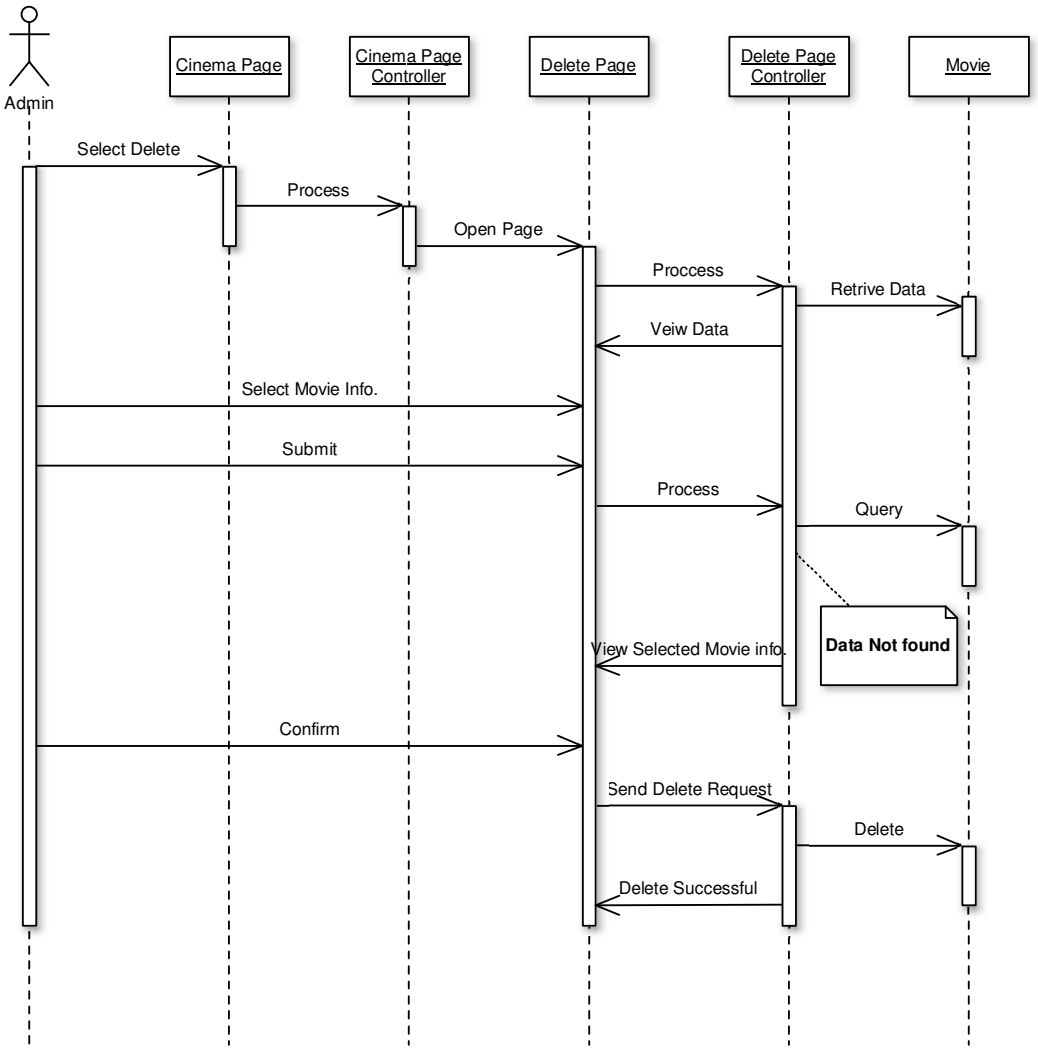


Figure 4.6: Delete Movie Sequence Diagram

Update Movie Sequence Diagram:

The administrator in this sequence diagram has the ability to update the movie through the system. Figure [4.7] show when the Admin select update movie and how this process will done.

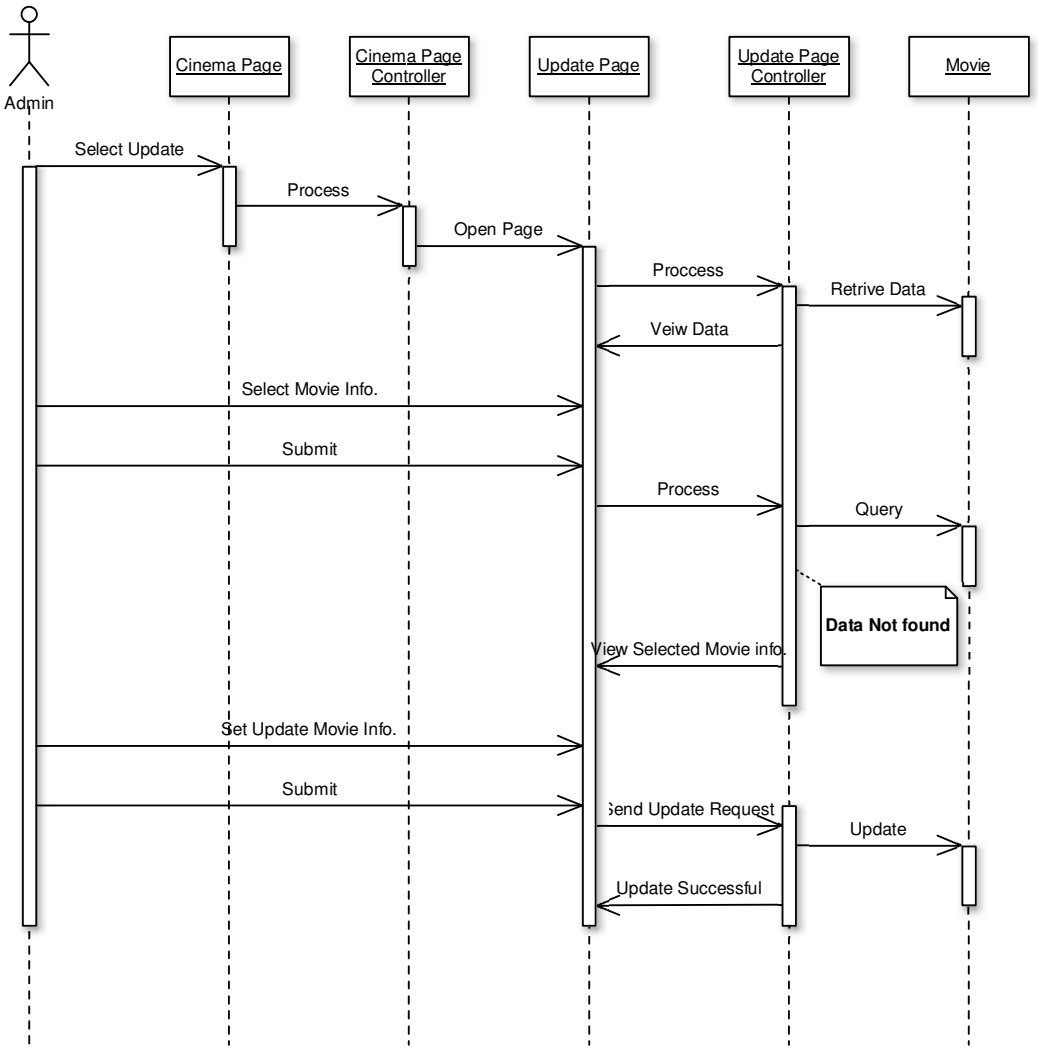


Figure 4.7: Update Movie Sequence Diagram

View Movie Sequence Diagram:

The administrator in this sequence diagram has the ability to view the movie through the system. Figure [4.8] show when the Admin select view movie and how this process will done.

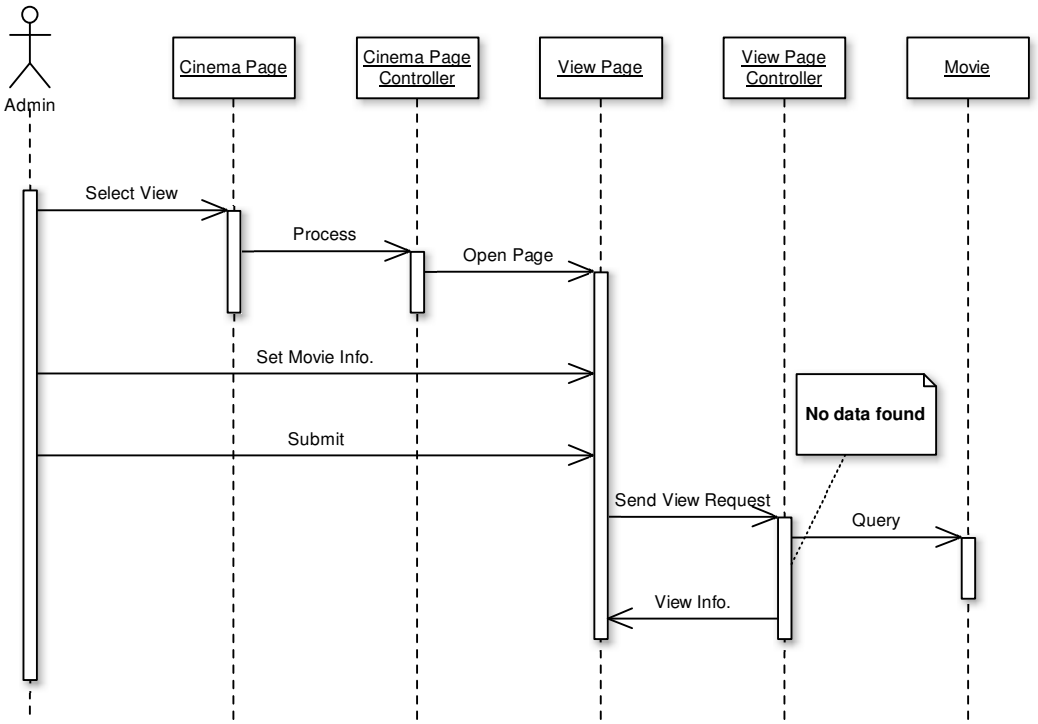


Figure 4.8: View Movie Sequence Diagram

Add Advertisement Sequence Diagram:

The administrator in this sequence diagram has the ability to add the advertisement through the system. Figure [4.9] show when the admin select add advertisement and how this process will done.

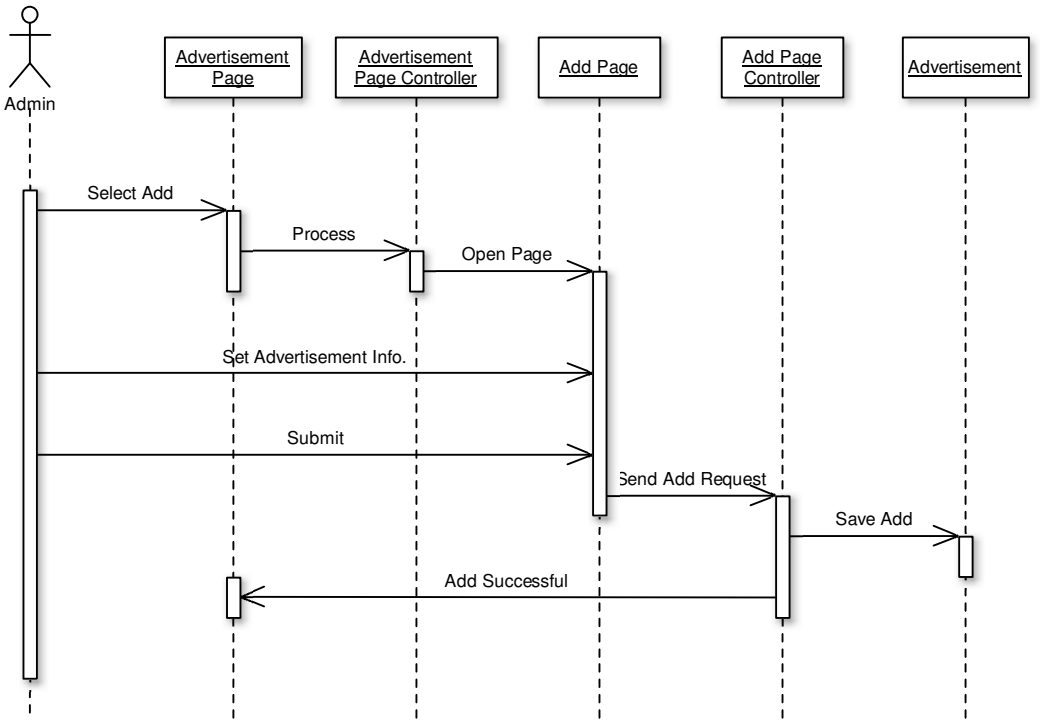


Figure 4.9: Add Advertisement Sequence Diagram

Delete Advertisement Sequence Diagram:

The administrator in this sequence diagram has the ability to delete the advertisement through the system. Figure [4.10] show when the admin select delete advertisement and how this process will done.

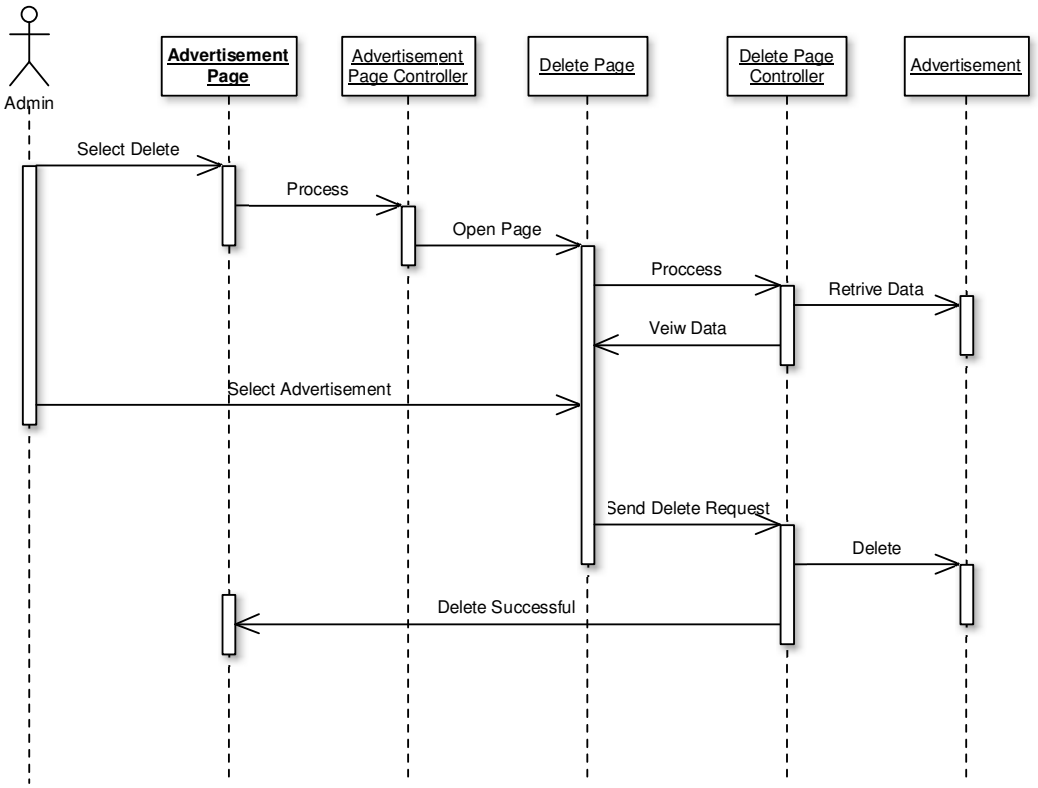


Figure 4.10: Delete Advertisement Sequence Diagram

Update Advertisement Sequence Diagram:

The administrator in this sequence diagram has the ability to update the advertisement through the system. Figure [4.11] show when the admin select update advertisement and how this process will done.

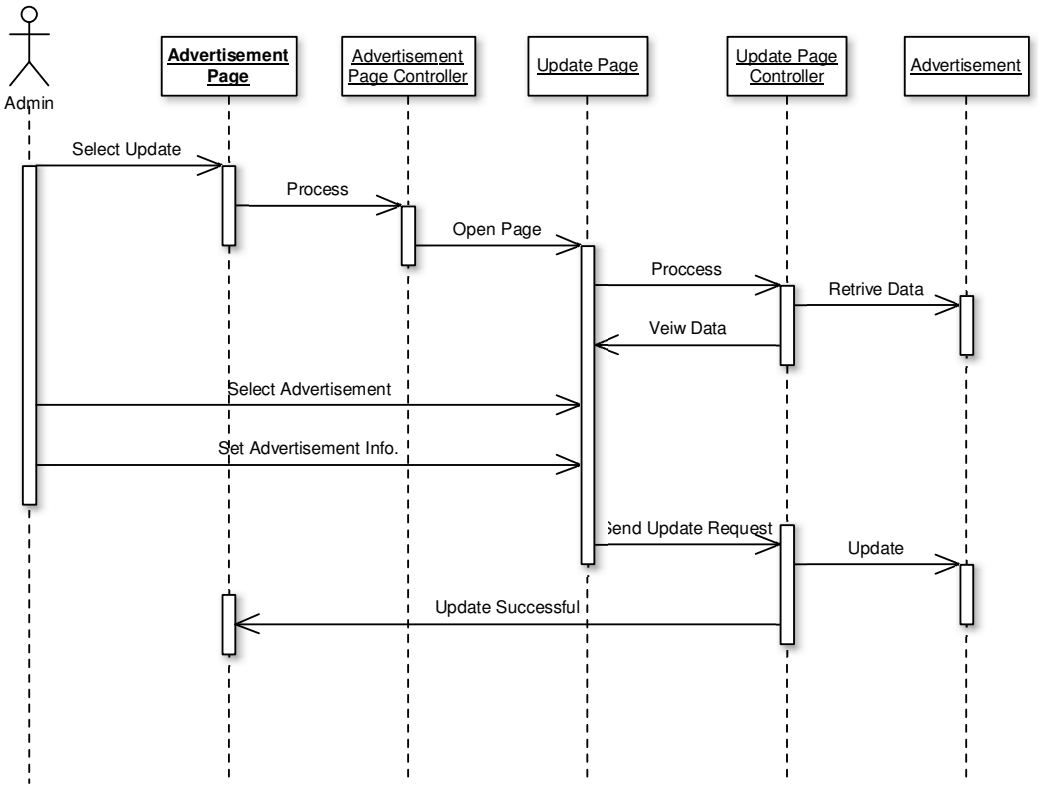


Figure 4.11: Update Advertisement Sequence Diagram

View Advertisement Sequence Diagra :

The administrator in this sequence diagram has the ability to view the advertisement through the system. Figure [4.12] show when the admin select view advertisement and how this process will done.

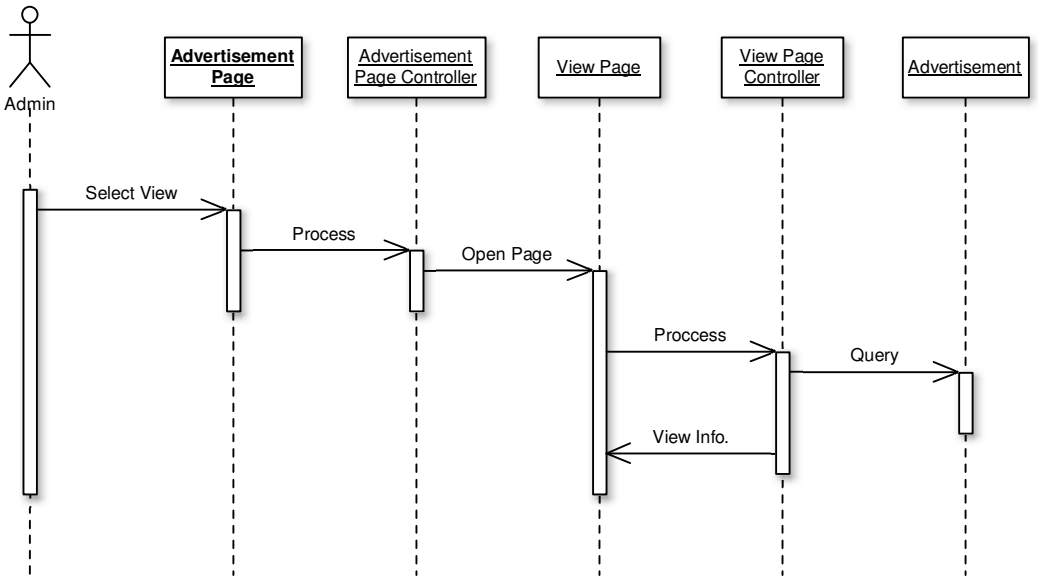


Figure 4.12: View Advertisement Sequence Diagram

View Customer Sequence Diagram:

The administrator in this sequence diagram has the ability to view the customer through the system. Figure [4.13] show when the admin select view customer and how this process will done.

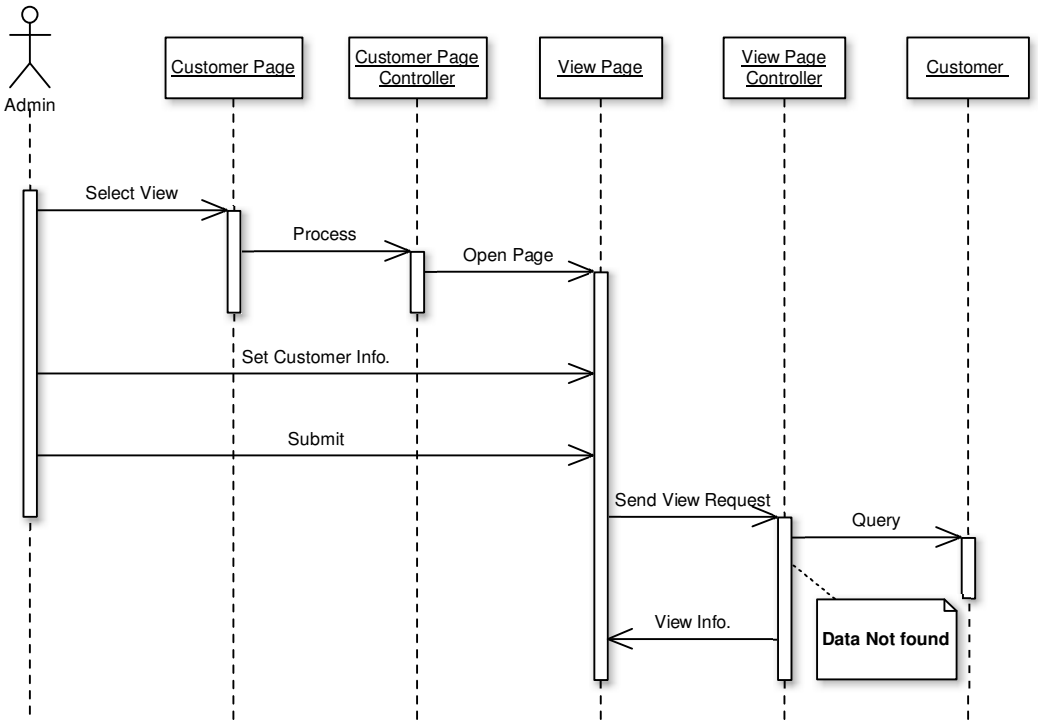


Figure 4.13: View Customer Sequence Diagram

View Booking Sequence Diagram:

The administrator and customer in this sequence diagram have the ability to view booking, where the admin has to enter the ticket No., while the customer has to set specific date for his/her ticket. Figure [4.14] show when the admin or customer select view booking and how this process will done.

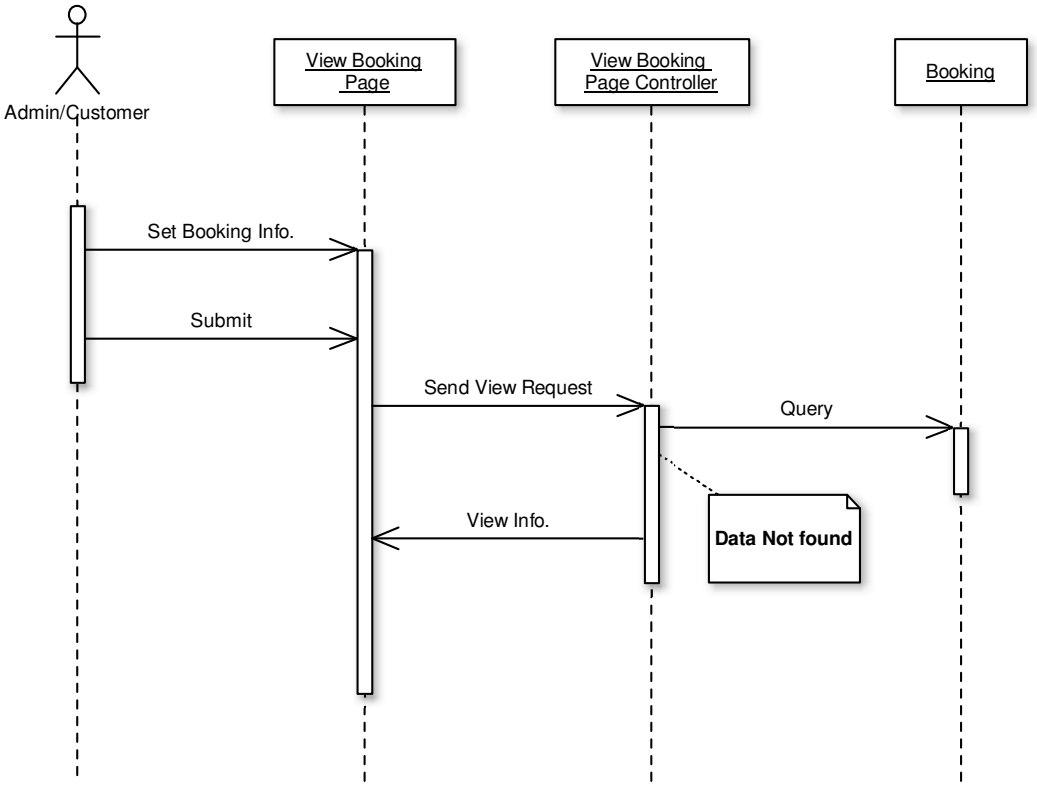


Figure 4.14: View Booking Sequence Diagram

Customer's Register Sequence Diagram :

The customer in this sequence diagram has the ability to make register through the system. Figure [4.15] show when the customer select register and how this process will done.

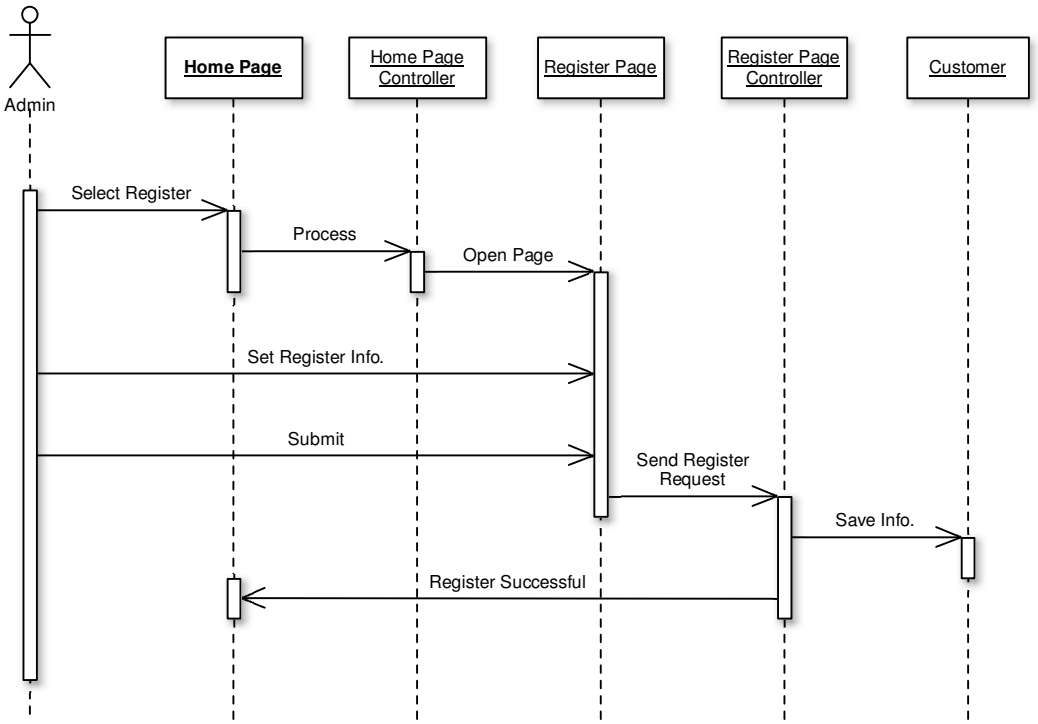


Figure 4.15: Customer's Register Sequence Diagram

Booking Sequence Diagram :

The customer in this sequence diagram has the ability to make booking mobile e-ticket for cinema through the system. Figure [4.16] show when the customer select booking and how this process will done.

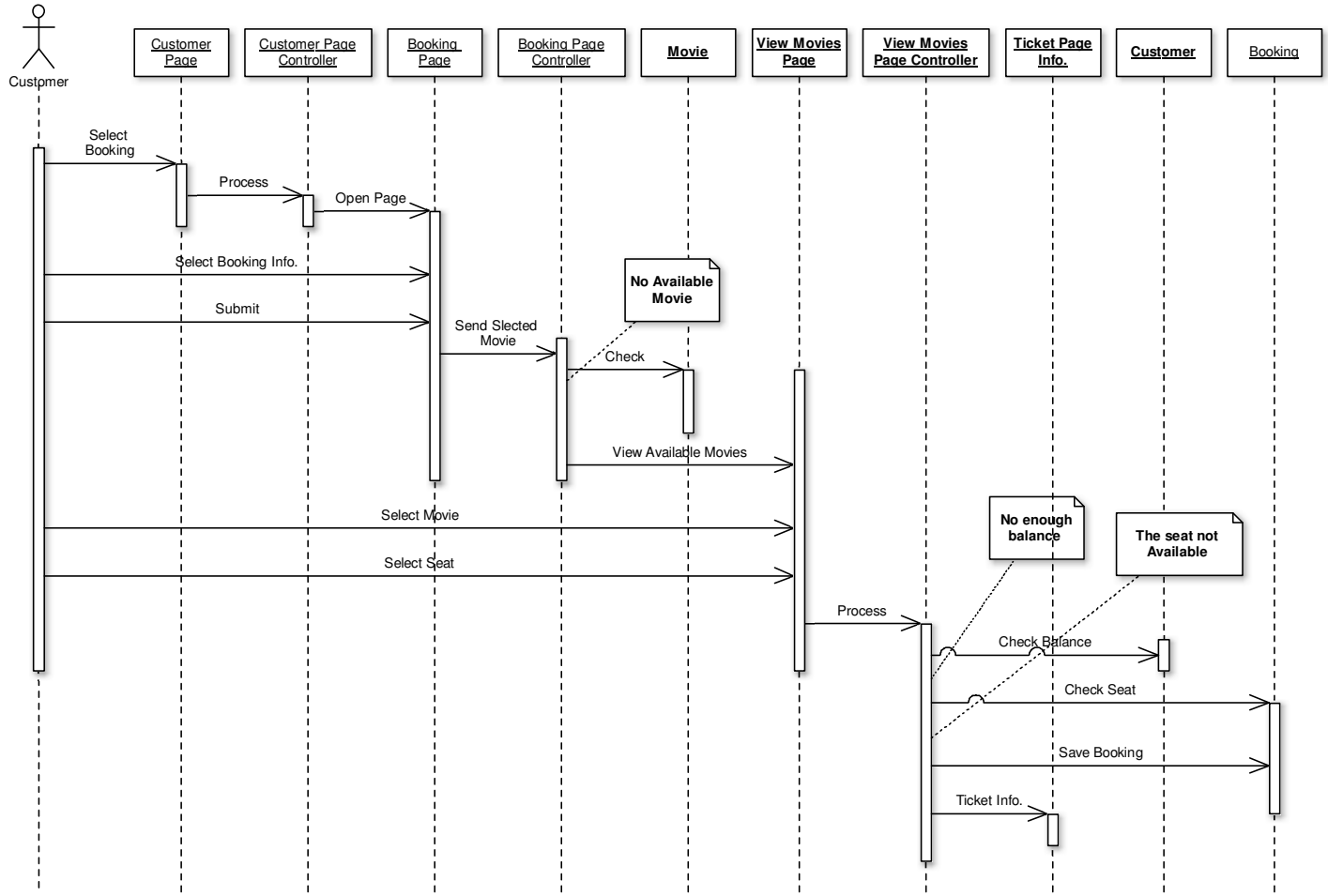


Figure 4.16: Booking Sequence Diagram

View Balance Sequence Diagram:

The customer in this sequence diagram has the ability to view his/her balance through the system. Figure [4.17] show when the customer select view balance and how this process will done.

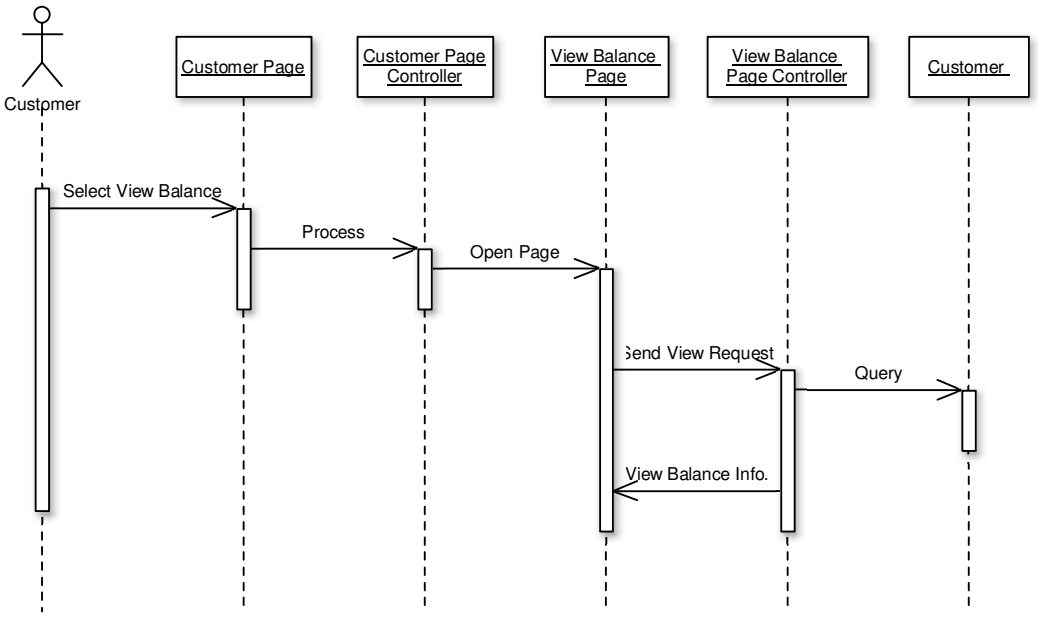


Figure 4.17: View Balance Sequence Diagram

View Profile Sequence Diagram:

The customer in this sequence diagram has the ability to view his/her profile through the system. Figure [4.18] show when the customer select view profile and how this process will done.

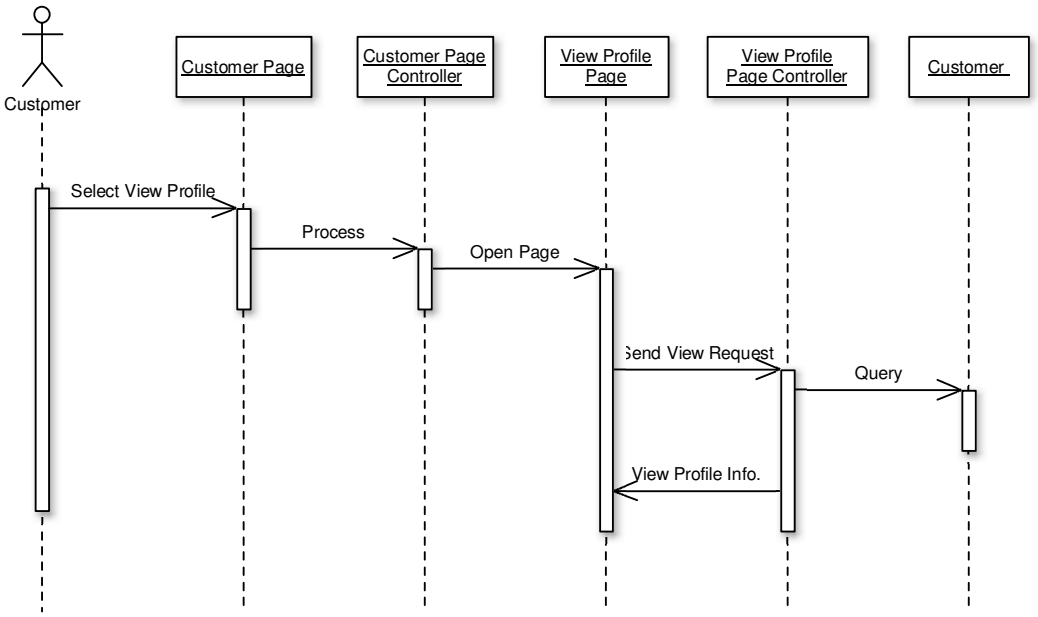


Figure 4.18: View Profile Sequence Diagram

4.7 Class Diagrams

The class diagram for MTMC Prototype included seven classes as show in figure 4.19.

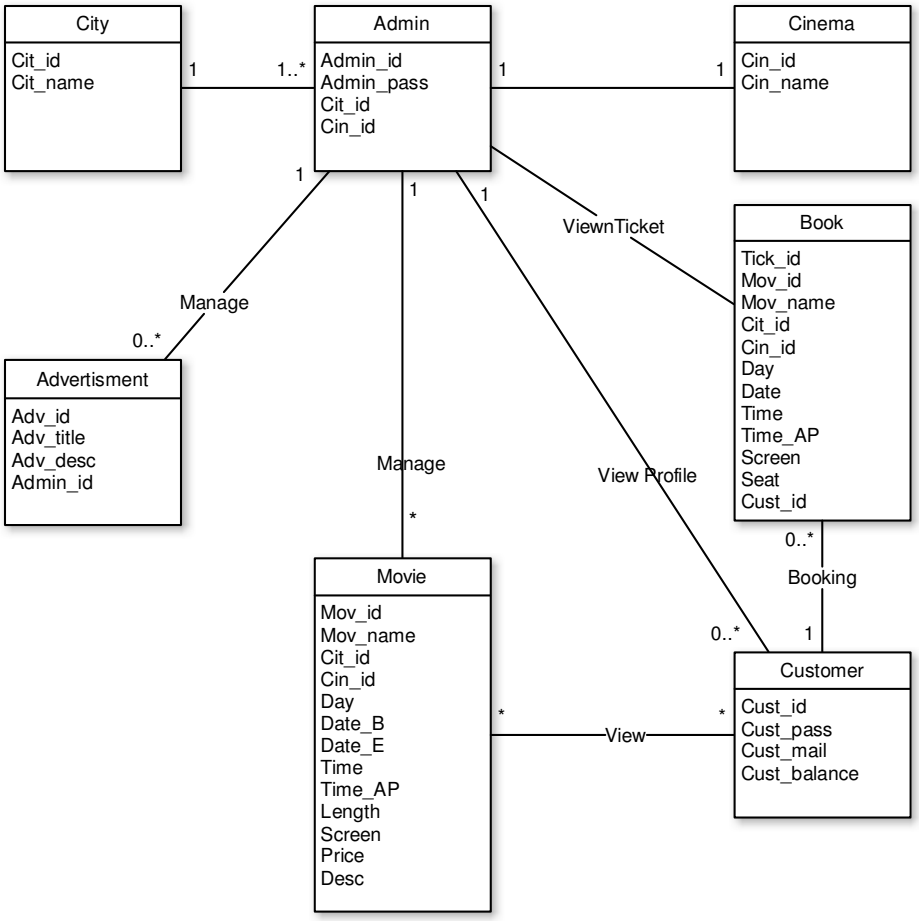


Figure 4.19: MTMC Class Diagrams

4.8 Design Interfaces for MTMC Prototype

The MTMC reservation prototype contains two parts, Web for admin cinema and Wap for customer booking.

4.8.1 Web Site Part

The home page for administrators for each cinema as in figure 4.20, we will but the using manual for this part in appendix B

Figure 4.20 Web home page of MTMC

4.9.2 WAP Part

This is the main part of developing the MTMC reservation prototype, this part give the customer the ability to the process of booking through a mobile phone, the customer only need to access to the wap address and choose his/her destination and get the ticket. This section for the booking customer interfaces.

The home page in MTMC reservation prototype customer can select one of (Login, Register, and Cinemas information) Figure 4.21.

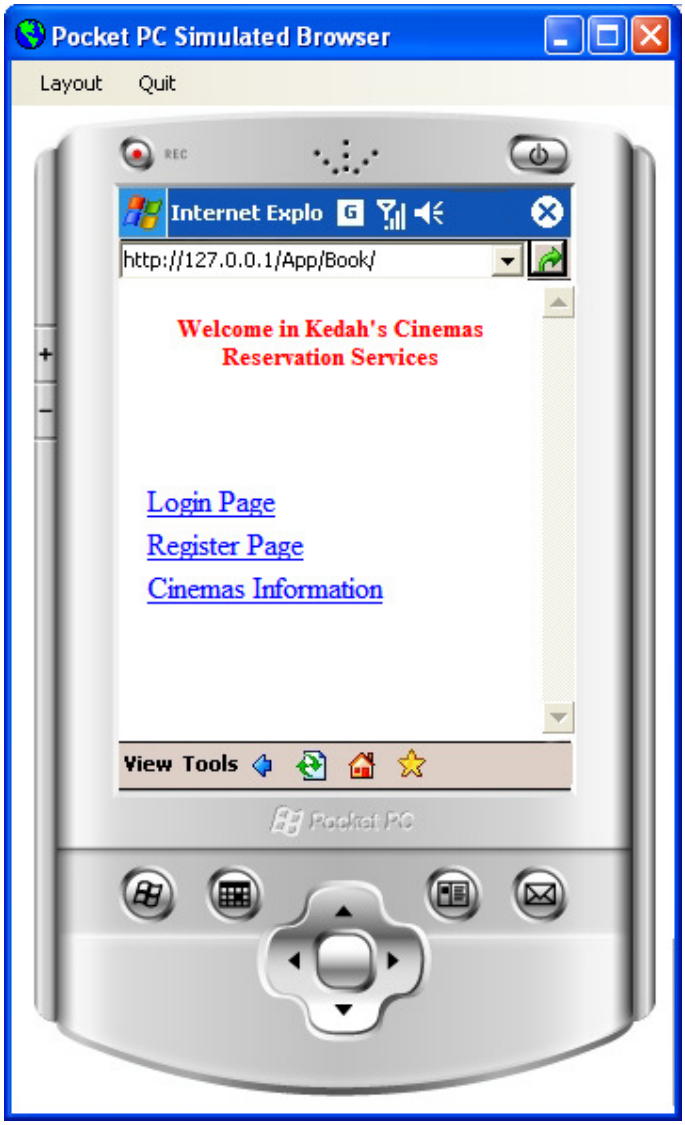


Figure 4.21: WAP Home Page of MTMC.

For new customer want to register in this service, customer will select Register Page and enter all information then press submit or press reset to inter new information. Also customer can go back to the main page by press home Figure 4.22.

Then there is successful registration's page will appear to thanks customer for register and guide him/her to home page to start login Figure 4.23.

Figure 4.22: Customer Register Page

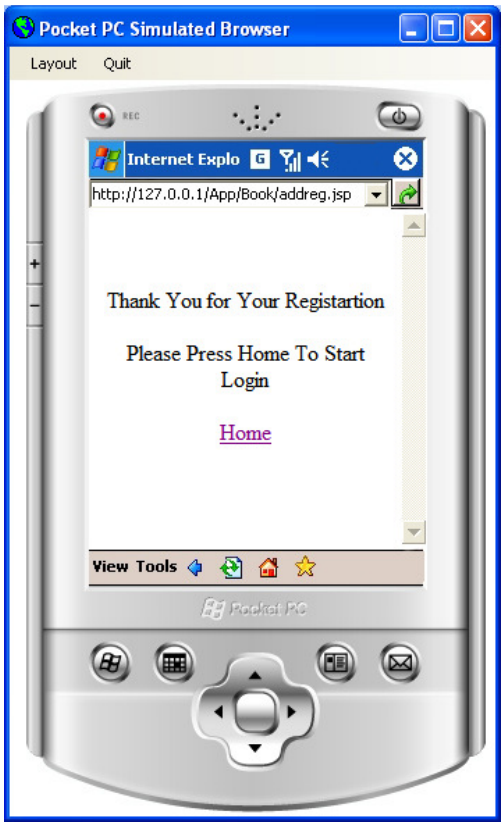


Figure 4.23: Successful Register Message

If customer selects cinemas information figure 4.24 will appear to display the list of city and cinema information.

If customer already has ID and Password can select login page and enter his/her login information then press submit or press reset to enter new information. Also customer can go back to the home page by press home link, as in figure 4.25.

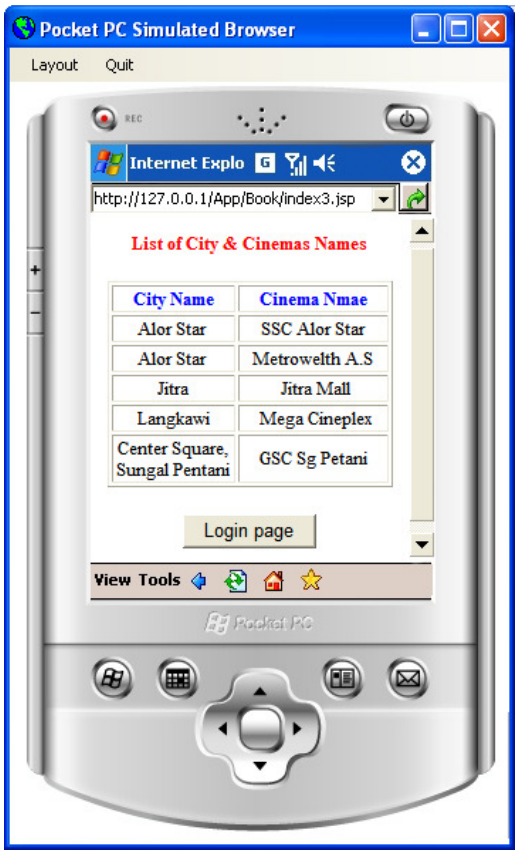


Figure 4.24: Cinema Info. Page

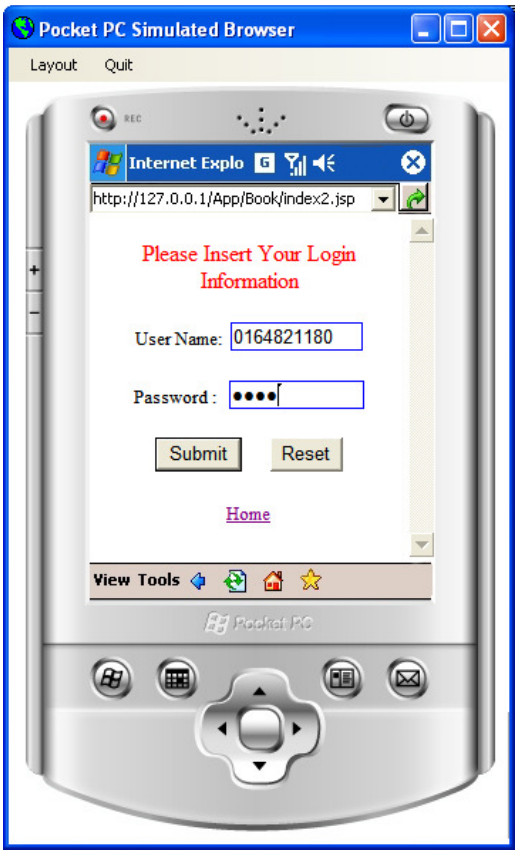


Figure 4.25: Customer Login Page

If customer entered wrong ID or Password, figure 4.26 will appear to guide him/her that it was invalid login information, and can go back home page by press home link.

If customer made successful login to the MTMC, customer page will appear as figure 4.27 to give customer the ability to make booking and many other important issues.

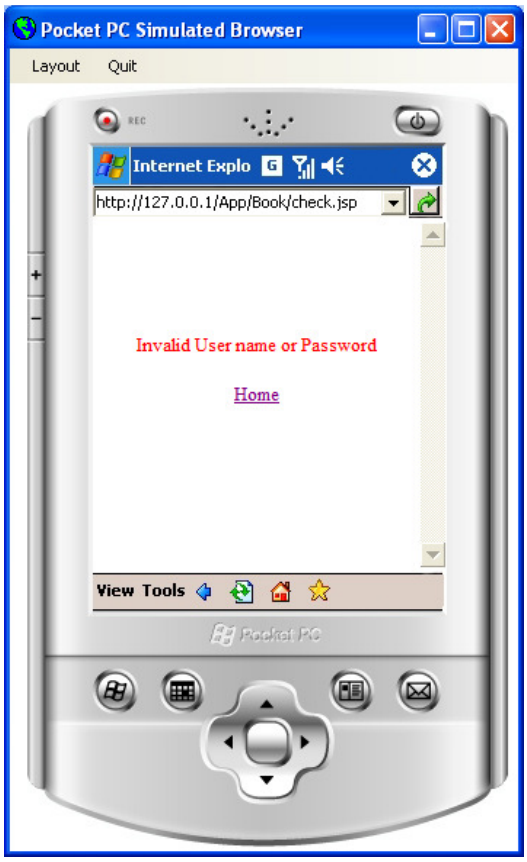


Figure 4.26: Invalid Login Message

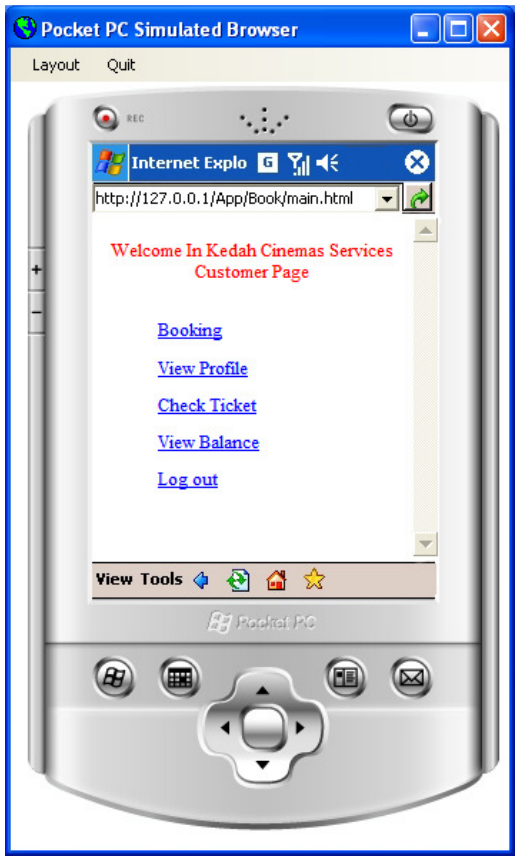


Figure 4.27: Customer Page

If customer wants to see profile, he/she can select view profile link and figure 4.28 will appear, also customer can go back to the home page by press home link.

For the customer's balance the customer can check his/her balance at anytime before/after booking by select view balance, we assumed that the customer has 30 in his/her account when registered in this service, this balance will decline when the customer booked. figure 4.29 will appear the customer balance page; also customer can go back to the home page by press home link.

Figure 4.28: Profile Customer Page

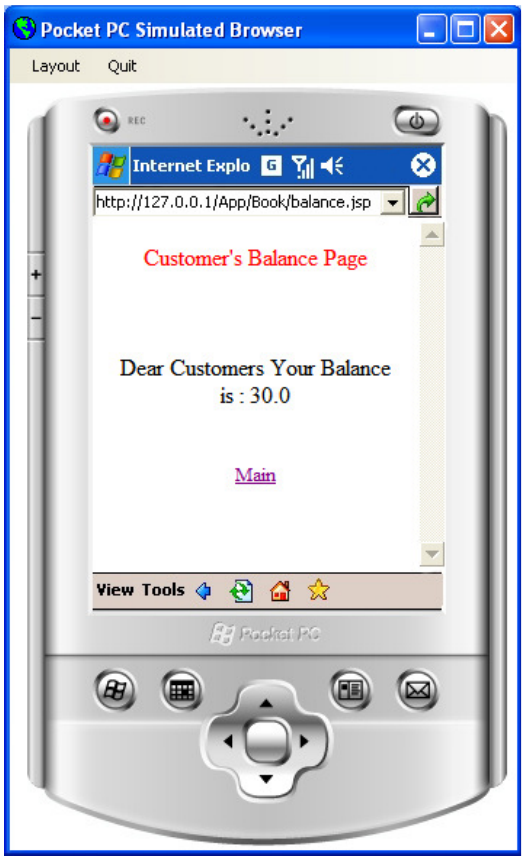


Figure 4.29: Customer Balance Page

If customer selects booking figure 4.30 will appear and ask customer to select his/her destination for the city name, cinema name, day and date. Customer should select booking information as in figure 4.31

Figure 4.30: Booking Page

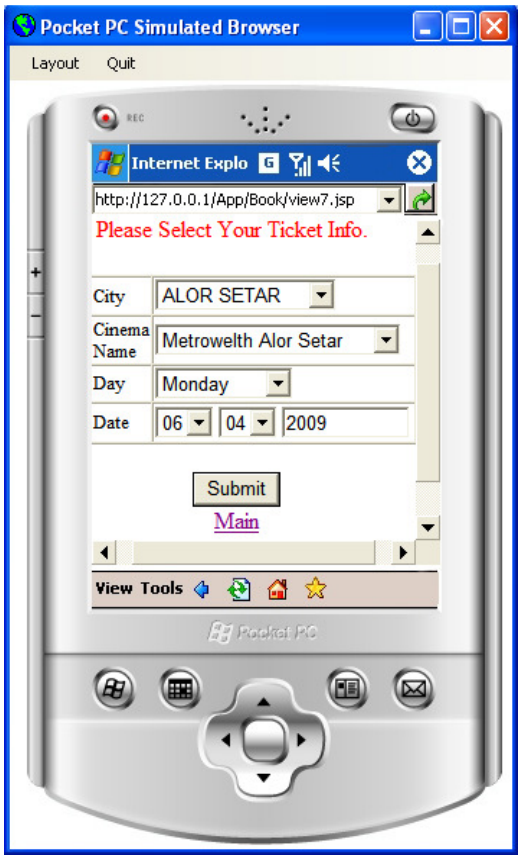


Figure 4.31: Select booking Info.

The system will check if there an available movie in this time or not. If there an available movies, the system will display them and numbers of these movies (view movies page). Customer can navigate and select one, figure 4.32.

Now the customer browsing all available movies, then he/she has to choose one and select the seat number. Because the different policy of cinemas companies this prototype assume that the seats from b1 to b9 are available to booking through mobile phone reservation, figure 4.33.

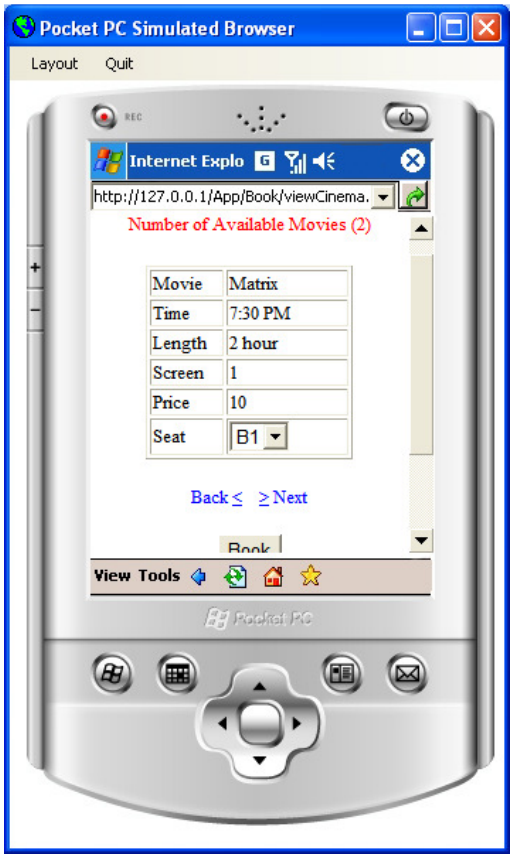


Figure 4.32: View Available movies

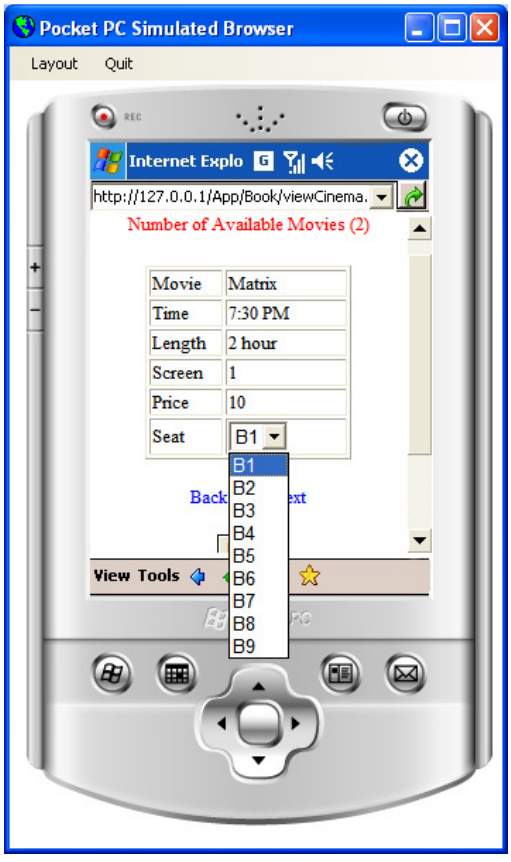


Figure 4.33: Select Seat No.

When customer has been chosen movie and select the seat and press Book, the system will check two things, first if the customer's balance enough to pay the cinema ticket or not, second if the seat are available or not.

If customer's balance not enough figure 4.34 will appear.

If the seat is not available figure 4.35 will appear.

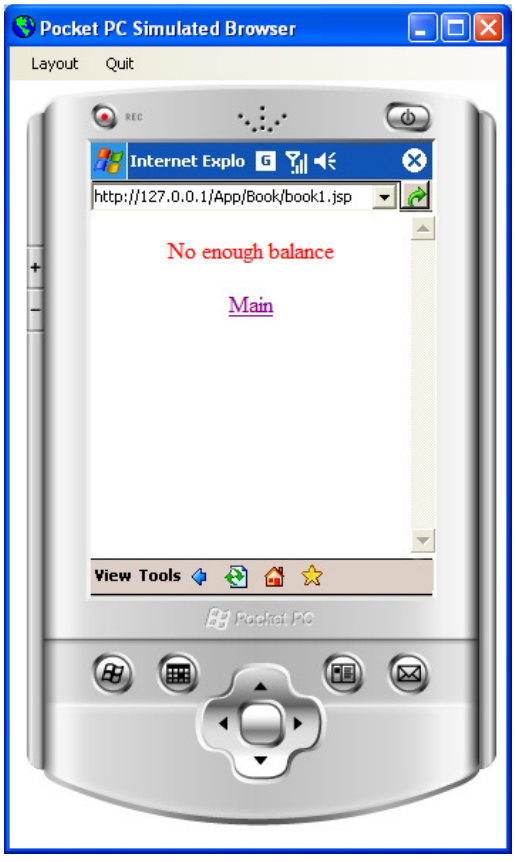


Figure 4.34 No Enough Balance Message

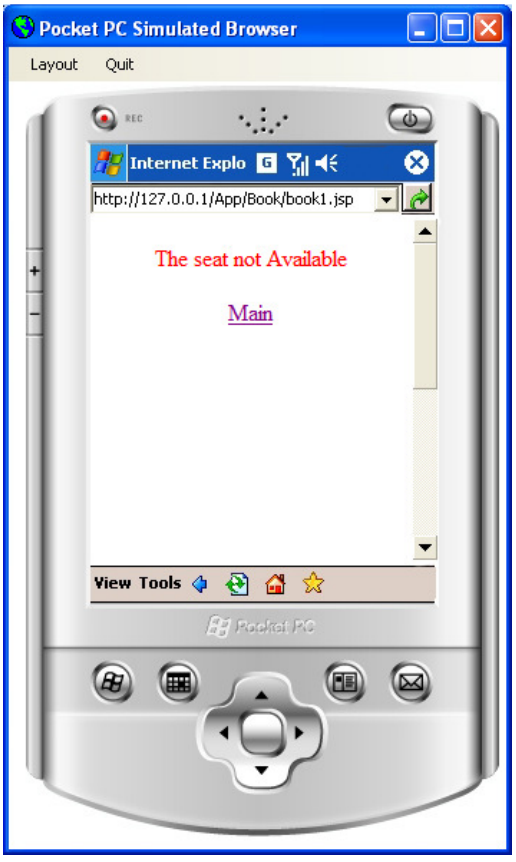


Figure 4.35: Seat Not Available Message

But if the balance and the seat are available, the customer will get ticket and the ticket information will appear to customer as figure 4.36.

If customer selects view ticket from the customer page to see his/her ticket's information at anytime, figure 4.37 will appear and ask customer to determine the date for the ticket.

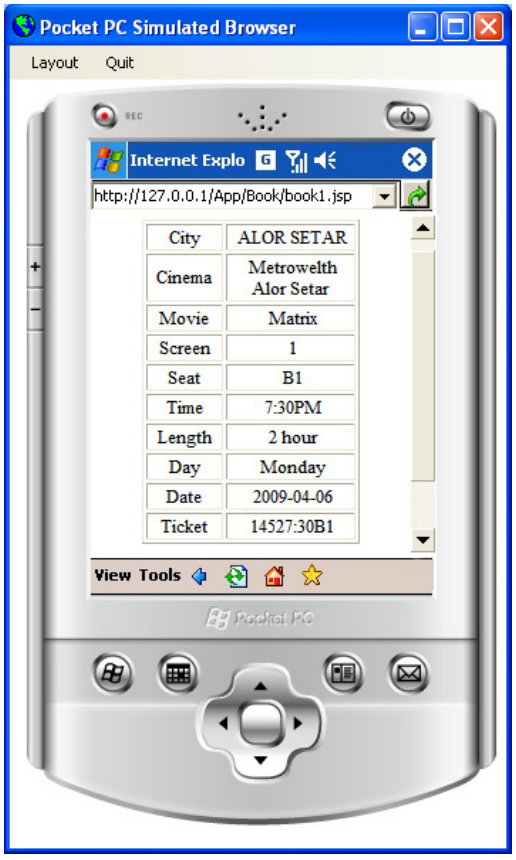


Figure 4.36: Ticket Info. Page

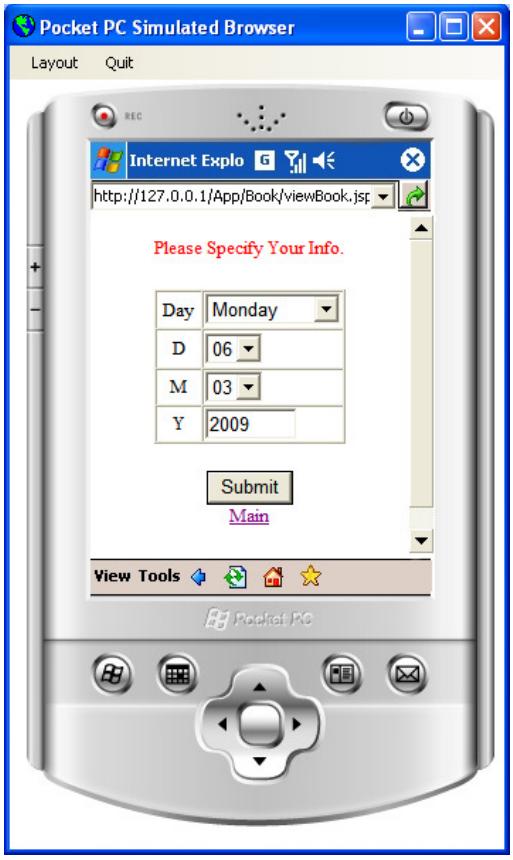


Figure 4.37: Check ticket Page

If there is ticket for this customer who use this prototype with this id in login, figure 4.38 will appear and give customer all the ticket information.

If there is no available ticket for this day, figure 4.39 will appear.

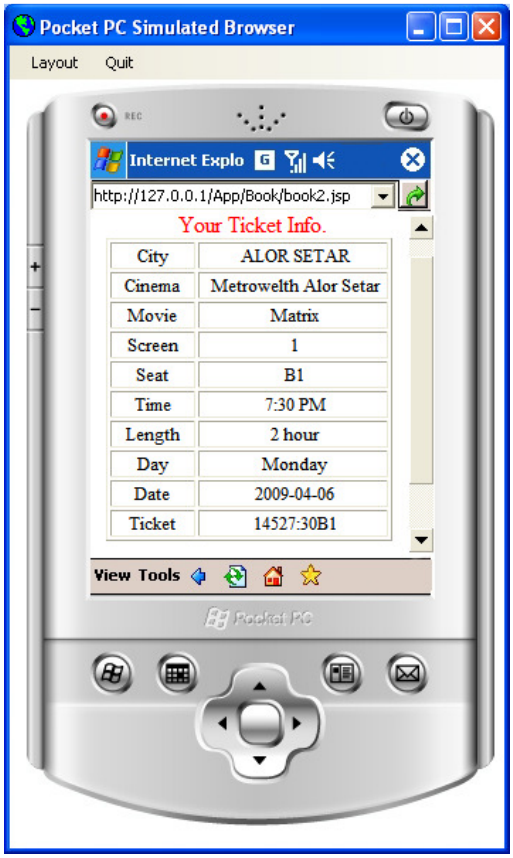


Figure 4.38: Ticket Info.

Figure 4.39: No Ticket Message

Finally user can select logout from customer page. Then the home page will appear.

4.10 Summary

This chapter covers the design and implementation of Mobile Ticketing for Malaysia'a Cinemas MTMC. Head started the system requirements and design collected during the first phase and the second phase of the methodology, in order, then this chapter was to highlight the architecture of the system how it design the flow of the adaptation process, finally designing user interface prototype.

CHAPTER FIVE

DISCUSSION OF RESULT

5.1 Introduction

The main aim of this chapter is to discuss the evaluation of the MT-MC developed prototype. As motioned before that the Usability is a quality attribute that assesses how easy user interfaces are to use (Nielsen, 2003). The usability test with end users is one of the most fundamental methods in usability evaluation (Holzinger, 2005), because real test users are asked to use the product which lead to provides direct information about how people use systems and their exact problems with a specific interface. This chapter will discuss the system evaluation and results for this study by focus on the descriptive analysis of the questions.

5.2 Evaluation Techniques

The evaluation was performed after the system has been developed to determine the level of usefulness and operability of the system; it is tested through a questionnaire and interview. The questionnaire has been distributed to public and an interview with the manager of cinema of Jitra mall was also conducted.

The sample size was 30 respondents; each participant was given a brief description of the functionality of MTMC prototype. Then, they were allowed to practice and

explore the prototype. Finally, they were given a set of prepared questionnaire to obtain their perceptions. The aim was to see the level of satisfaction and perception of the developed prototype ease of use and operability of the prototype system.

5.3 Evaluation Questionnaire

The questionnaire questions were prepared and adopted from different standard questionnaire (Lund, 2001), (Lewis, 1993), (Lin, Choong, & Salvendy, 1997). It consisted of two main sections; firstly the general information which intended to gather demographic data about the sample and its distribution, the second part included questions about the perceptions of the participant regarding different dimensions of Usefulness, Ease of use and learning, Guidance, Flexibility, and Satisfaction of MTMC. The questions were close ended and scaled in five levels from "Strongly disagree" to "strongly agree"(1= Strongly Disagree; 2= Disagree; 3= Not Sure 4= Agree; 5= Strongly Agree). Finally, there was an interview face to face with the manager of cinema of Jetra mall, where several questions related to usability and benefits of the MTMC with respect to both parts (web part for the management of the cinema and wap part for ability of user to booking).

5.4 Data Analysis

The data collected through the questionnaire has been analyzed using SPSS software, version 11.5. Different statistics were used for data analysis. The following section describes the result obtained through analysis of data.

The following information was gathering from the first section of the questionnaire. All of the 30 participants were international and Malaysian-local students in UUM. The analysis shows that:

5.4.1 Demographic Distribution of the Sample

The following information was gathering from the first section of the questionnaire for participants. The analysis shows that 73.33% of participants are male and 26.67% are female, see chart 1.

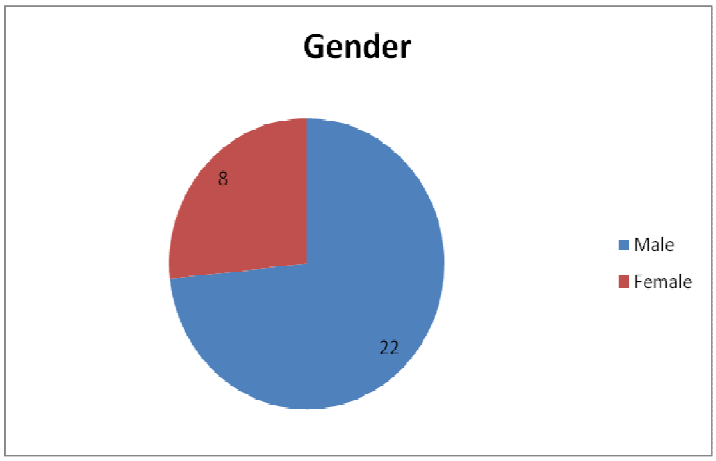


Chart 5.1: Gender of Participants

The age of the sample range from 15-40 years old, see chart 2.

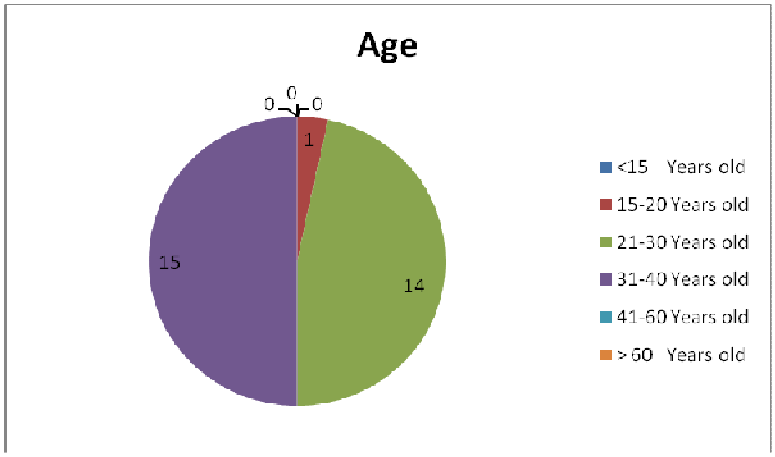


Chart 5.2: Age of Participants

For the race distribution of the study sample, were: 10% are Malay, 3.3% are Chinese, zero% are Indian, and 86.7% are from other nationalities, see chart 3.

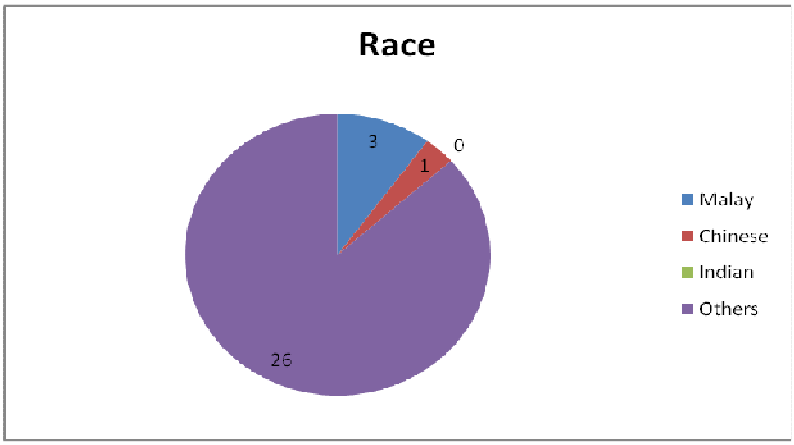


Chart 5.3: Race of Participants

All participants are using mobile. The participants relation with the information technology was 76.67% related with IT, while 23.33% do not related, see chart 4.

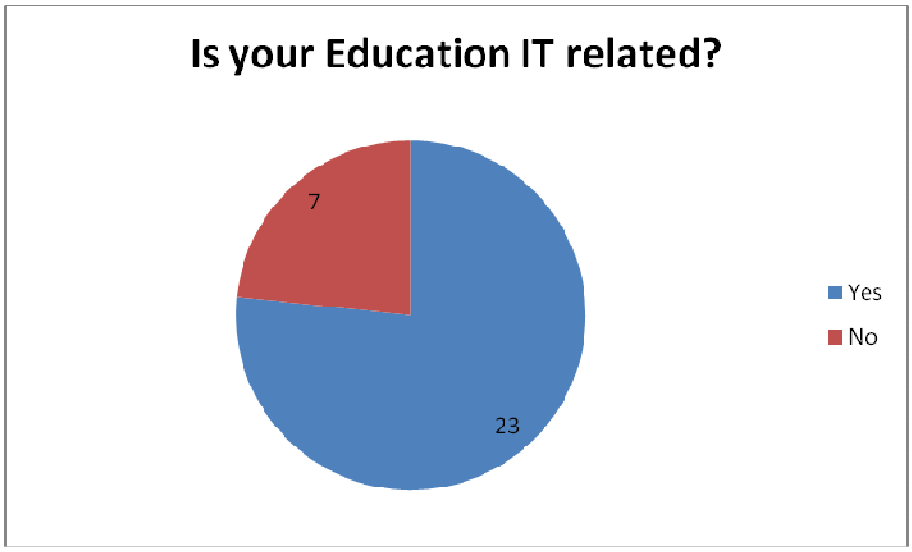


Chart 5.4: Related with information technology

Statistical analysis of the data also indicates that 66.67% using wap application, while the rest 33.33% do not use, see chart 5.

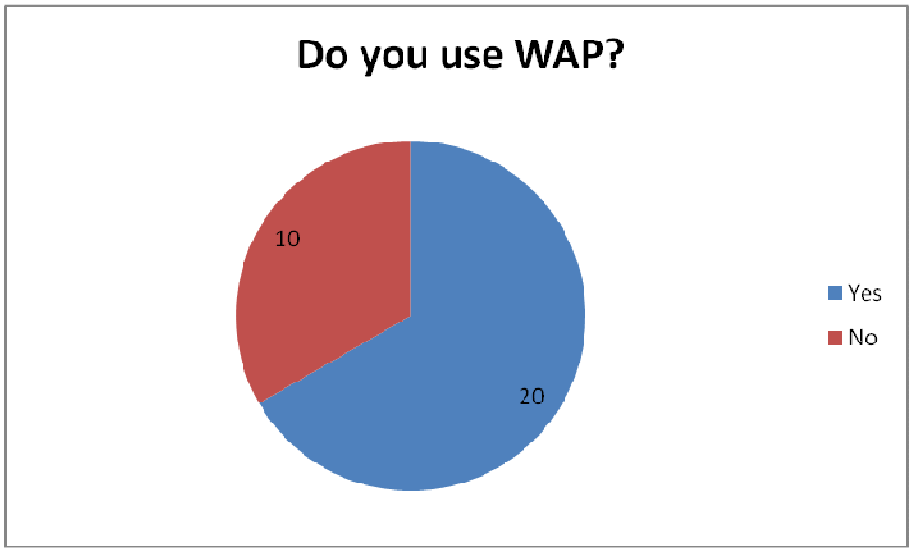


Chart 5.5: Using WAP

5.4.2 Usability Testing Results

the usability test with end users is one of the most fundamental methods in usability evaluation (Holzinger, 2005),

5.4.2.1 Descriptive Statistic

The usability evaluation of the perception of users on the cinema mobile ticketing reservation system is described through descriptive statistics. The important role of statistic is data gathered, formulated, that provides formulation that can easily understand by projecting group. Descriptive statistic can be used for this purpose.

5.4.2.1.1 Usefulness Descriptive Statistics of MT-MC

Table 5.1 describes the number of the respondent, the minimum and maximum answer, the mean and the STD deviation for system usefulness.

Table 5.1: Usefulness Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Q1	30	2.00	3.00	5.00	4.4667	.62881
Q2	30	2.00	3.00	5.00	4.5667	.56832
Q3	30	2.00	3.00	5.00	4.4667	.57135
Q4	30	3.00	2.00	5.00	3.9000	.84486
Q5	30	2.00	3.00	5.00	4.1000	.71197
Q6	30	2.00	3.00	5.00	4.4000	.62146
Q7	30	2.00	3.00	5.00	4.0667	.73968
Valid N (listwise)	30					

Since the seven questions measure the system usefulness, we have to divide the summation of the corresponding values in the "mean" column by its number, so we found that the mean of the all mean values which are corresponding to the usefulness questions is 4.281 is equal almost 85.62 which indicate that the system usefulness is agree altitude toward which indicate that the system benefits are high.

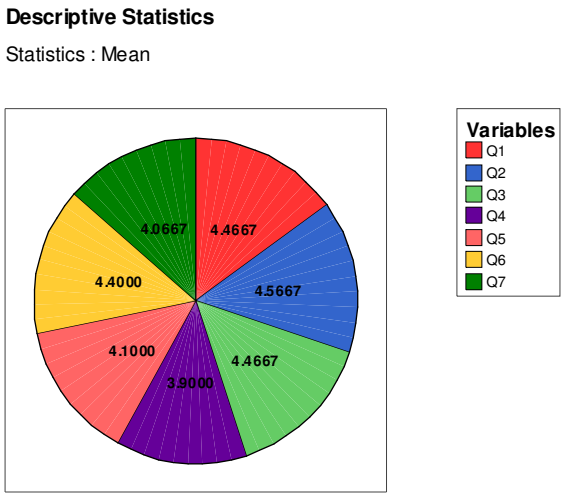


Chart 5.6: Usefulness Descriptive Statistics

5.4.2.1.2 Ease of use and learning Descriptive Statistics of MT-MC

Table 5.2 describes the number of the respondent, the minimum and maximum answer, the mean and the STD deviation for ease of use and learning of system.

Table 5.2: Ease of use and learning Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Q8	30	2.00	3.00	5.00	4.6000	.72397
Q9	30	2.00	3.00	5.00	4.4333	.62606
Q10	30	2.00	3.00	5.00	4.5000	.68229
Q11	30	2.00	3.00	5.00	4.2333	.56832
Q12	30	2.00	3.00	5.00	4.0333	.76489
Q13	30	4.00	1.00	5.00	4.1667	.94989
Q14	30	3.00	2.00	5.00	4.1000	.88474
Q15	30	4.00	1.00	5.00	3.9000	1.02889
Q16	30	2.00	3.00	5.00	4.4667	.57135
Q17	30	2.00	3.00	5.00	4.5333	.57135
Q18	30	2.00	3.00	5.00	4.5667	.62606
Valid N (listwise)	30					

Since the eleven questions measure the ease of use and learning of system, we have to divide the summation of the corresponding values in the "mean" column by its number, so we found that the mean of the all mean values which are corresponding to the ease of use and learning questions is 4.321 is equal almost 86.424 which indicate that the ease of use and learning of system is agree altitude toward which indicate that the system benefits are high.

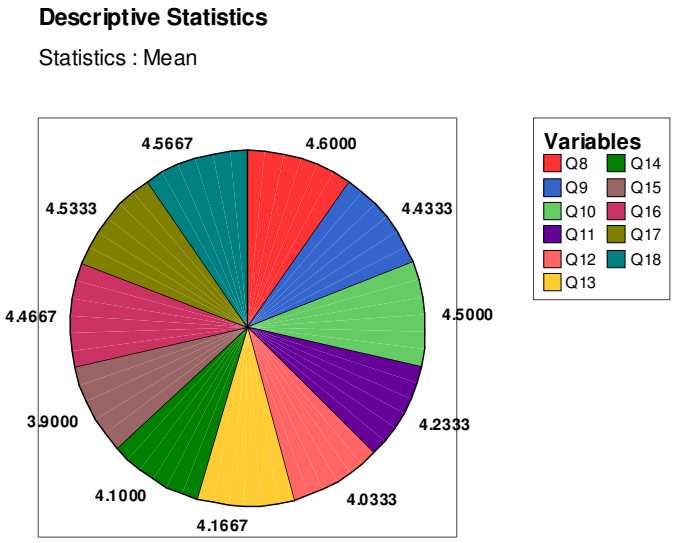


Chart 5.7: Ease of use and learning Descriptive Statistics

5.4.2.1.3 User Guidance Descriptive Statistics of MT-MC

Table 5.3 describes the number of the respondent, the minimum and maximum answer, the mean and the STD deviation for the system user guidance.

Table 5.3: User Guidance Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Q19	30	2.00	3.00	5.00	4.2333	.72793
Q20	30	2.00	3.00	5.00	4.1667	.69893
Q21	30	2.00	3.00	5.00	4.3333	.66089
Q22	30	2.00	3.00	5.00	4.3000	.83666
Q23	30	2.00	3.00	5.00	4.2333	.77385
Valid N (listwise)	30					

Since the five questions measure the system user guidance, we have to divide the summation of the corresponding values in the "mean" column by its number, so we found that the mean of the all mean values which are corresponding to the user guidance questions is 4.253 is equal almost 85.066 which indicate that the system

user guidance is agree altitude toward which indicate that the system benefits are high.

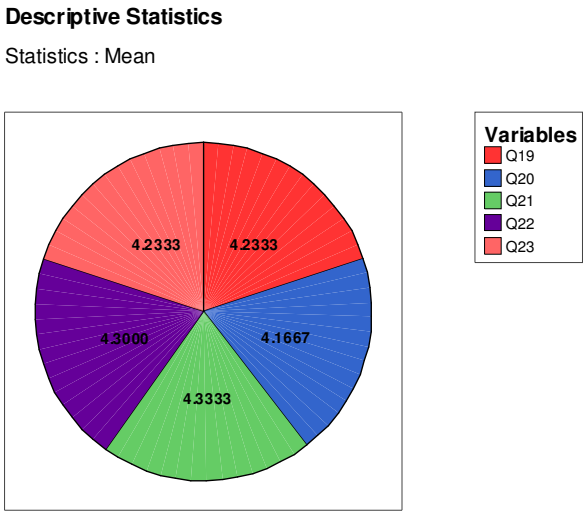


Chart 5.8: User Guidance Descriptive Statistics

5.4.2.1.4 Flexibility Descriptive Statistics of MT-MC

Table 5.4 describes the number of the respondent, the minimum and maximum answer, the mean and the STD deviation for the system flexibility.

Table 5.4: Flexibility Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Q24	30	2.00	3.00	5.00	4.4333	.67891
Q25	30	2.00	3.00	5.00	4.5333	.57135
Q26	30	2.00	3.00	5.00	4.4000	.67466
Q27	30	2.00	3.00	5.00	4.4667	.62881
Q28	30	2.00	3.00	5.00	4.1000	.60743
Q29	30	2.00	3.00	5.00	4.6333	.55605
Q30	30	2.00	3.00	5.00	4.7333	.58329
Valid N (listwise)	30					

Since the seven questions measure the system flexibility, we have to divide the summation of the corresponding values in the "mean" column by its number, so we

found that the mean of the all mean values which are corresponding to the flexibility questions is 4.471 is equal almost 89.428 which indicate that the system flexibility is agree altitude toward which indicate that the system benefits are high.

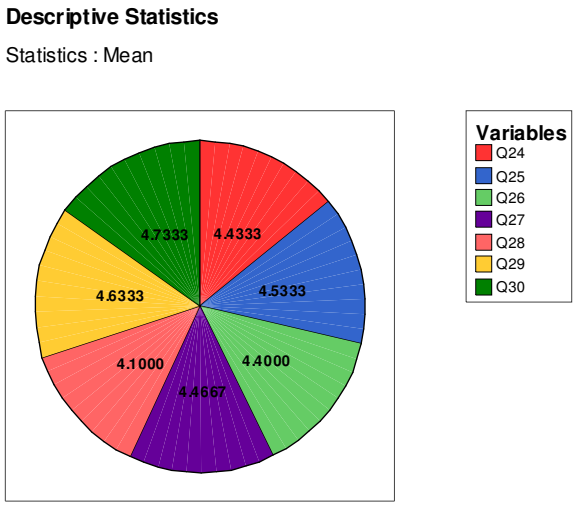


Chart 5.9: Flexibility Descriptive Statistics

5.4.2.1.5 Using MT-MC (Satisfaction) Descriptive Statistics

Table 5.5 describes the number of the respondent, the minimum and maximum answer, the mean and the STD deviation for the system satisfaction.

Table 5.5: Using MT-MC (Satisfaction) Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Q31	30	2.00	3.00	5.00	4.5333	.68145
Q32	30	2.00	3.00	5.00	4.3333	.71116
Q33	30	2.00	3.00	5.00	4.5333	.68145
Q34	30	2.00	3.00	5.00	4.3667	.61495
Q35	30	2.00	3.00	5.00	4.0667	.69149
Q36	30	2.00	3.00	5.00	4.0333	.71840
Q37	30	2.00	3.00	5.00	4.2333	.67891
Q38	30	2.00	3.00	5.00	4.1333	.73030
Q39	30	2.00	3.00	5.00	4.5333	.57135
Q40	30	1.00	4.00	5.00	4.5333	.50742
Q41	30	2.00	3.00	5.00	4.6333	.61495
Valid N (listwise)	30					

Since the eleven questions measure the system satisfaction, we have to divide the summation of the corresponding values in the "mean" column by its number, so we found that the mean of the all mean values which are corresponding to the satisfaction questions is 4.358 is equal almost 87.151 which indicate that the system satisfaction is agree altitude toward which indicate that the system benefits are high.

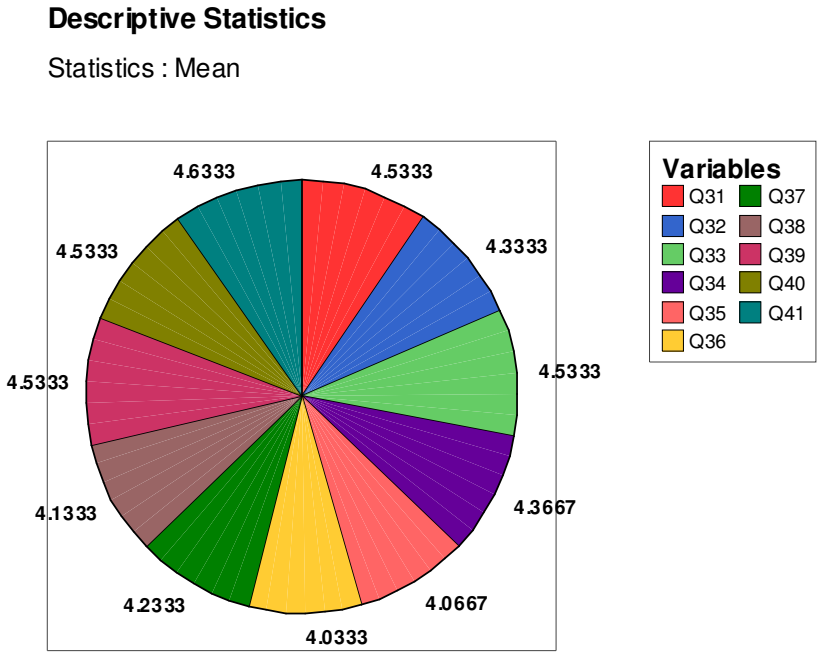


Chart 5.10: Using MT-MC (Satisfaction) Descriptive Statistics

Table 5.6 shows general information descriptive statistics, included the number of the respondents, the range, the minimum and maximum answer, the mean and standard deviation for all sections of the questionnaire. These sections included x1 to x7 in regard to system usefulness, x8 to x18 in regard to ease of use and learning of system, x19 to x23 in regard to system guidance, x24 to x30 in regard to system flexibility, x31 to x41 in regard to respondent's satisfaction for system

Table 5.6: General Information Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
X1	30	2.00	3.00	5.00	4.4667	.62881
X2	30	2.00	3.00	5.00	4.5667	.56832
X3	30	2.00	3.00	5.00	4.4667	.57135
X4	30	3.00	2.00	5.00	3.9000	.84486
X5	30	2.00	3.00	5.00	4.1000	.71197
X6	30	2.00	3.00	5.00	4.4000	.62146
X7	30	2.00	3.00	5.00	4.0667	.73968
X8	30	2.00	3.00	5.00	4.6000	.72397
X9	30	2.00	3.00	5.00	4.4333	.62606
X10	30	2.00	3.00	5.00	4.5000	.68229
X11	30	2.00	3.00	5.00	4.2333	.56832
X12	30	2.00	3.00	5.00	4.0333	.76489
X13	30	4.00	1.00	5.00	4.1667	.94989
X14	30	3.00	2.00	5.00	4.1000	.88474
X15	30	4.00	1.00	5.00	3.9000	1.02889
X16	30	2.00	3.00	5.00	4.4667	.57135
X17	30	2.00	3.00	5.00	4.5333	.57135
X18	30	2.00	3.00	5.00	4.5667	.62606
X19	30	2.00	3.00	5.00	4.2333	.72793
X20	30	2.00	3.00	5.00	4.1667	.69893
X21	30	2.00	3.00	5.00	4.3333	.66089
X22	30	2.00	3.00	5.00	4.3000	.83666
X23	30	2.00	3.00	5.00	4.2333	.77385
X24	30	2.00	3.00	5.00	4.4333	.67891
X25	30	2.00	3.00	5.00	4.5333	.57135
X26	30	2.00	3.00	5.00	4.4000	.67466
X27	30	2.00	3.00	5.00	4.4667	.62881
X28	30	2.00	3.00	5.00	4.1000	.60743
X29	30	2.00	3.00	5.00	4.6333	.55605
X30	30	2.00	3.00	5.00	4.7333	.58329
X31	30	2.00	3.00	5.00	4.5333	.68145
X32	30	2.00	3.00	5.00	4.3333	.71116
X33	30	2.00	3.00	5.00	4.5333	.68145
X34	30	2.00	3.00	5.00	4.3667	.61495
X35	30	2.00	3.00	5.00	4.0667	.69149
X36	30	2.00	3.00	5.00	4.0333	.71840
X37	30	2.00	3.00	5.00	4.2333	.67891
X38	30	2.00	3.00	5.00	4.1333	.73030
X39	30	2.00	3.00	5.00	4.5333	.57135
X40	30	1.00	4.00	5.00	4.5333	.50742
X41	30	2.00	3.00	5.00	4.6333	.61495

5.4.2.2 Reliability Statistics

According to (Yu, 2000) in general the higher the Alpha is, the more reliable the test is. There is not a commonly arranged cut-off; but, usually 0.7 and above is acceptable.

5.4.2.2.1 Usefulness Reliability Statistics of MT-MC

Table 5.7 shows the Cronbach's Alpha based on standardized item for usefulness reliability statistics

Table 5.7: Usefulness Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.7972	.8055	7

5.4.2.2.2 Ease of use and learning Reliability Statistics of MT-MC

Table 5.8 shows the Cronbach's Alpha based on standardized item for ease of use and learning reliability statistics.

Table 5.8: Ease of use and learning Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.7958	.7914	11

5.4.2.2.3 User Guidance Reliability Statistics of MT-MC

Table 5.9 shows the Cronbach's Alpha based on standardized item for user guidance reliability statistics.

Table 5.9: User Guidance Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.7505	.7516	5

5.4.2.2.4 Flexibility Reliability Statistics of MT-MC

Table 5.10 shows the Cronbach's Alpha based on standardized item for flexibility reliability statistics.

Table 5.10: Flexibility Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.7433	.7400	7

5.4.2.2.5 Using MT-MC (Satisfaction) Reliability Statistics

Table 5.11 shows the Cronbach's Alpha based on standardized item for satisfaction reliability statistics.

Table 5.11: Using MT-MC (Satisfaction) Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.7498	.7437	11

Table 5.12 shows the Cronbach's Alpha based on standardized item, this way used to measure the reliability scale for this study.

Table 5.12: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.927	.929	41

5.4.2.3 Summary Item Statistics

Table 5.3 shows the totaly of the mean, minimum, maximum, range, variance and number of all items in the questionnaire.

Table 5.13: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.341	3.900	4.733	.833	1.214	.047	41

5.4.2.4 Item-Total Statistics

One of the most important for questionnaire reliability is: the scale if item deleted. And as 0.8 is seen as good value for alpha (Field, 2006) .If questionnaire is reliable, there is no any one item to greatly affect the overall reliability, and then the value of Cronbach's alpha will be around 0.8 or higher if that item were deleted.

Table 5.4 shows the percentage of scale mean if item deleted, the scale variance if item deleted, the corrected item total correlation and the cronbach's alpha if item deleted, of reliability scale for the system

Table 5.14: Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
X1	173.5333	193.844	.554	.925
X2	173.4333	193.702	.626	.924
X3	173.5333	196.326	.455	.926
X4	174.1000	193.610	.409	.926
X5	173.9000	192.162	.571	.925
X6	173.6000	191.352	.709	.923

X7	173.9333	195.168	.398	.926
X8	173.4000	187.834	.785	.922
X9	173.5667	193.978	.548	.925
X10	173.5000	192.948	.555	.925
X11	173.7667	199.495	.256	.927
X12	173.9667	189.895	.638	.924
X13	173.8333	191.730	.430	.926
X14	173.9000	192.300	.442	.926
X15	174.1000	197.472	.187	.930
X16	173.5333	200.602	.186	.928
X17	173.4667	200.671	.181	.928
X18	173.4333	192.668	.626	.924
X19	173.7667	189.426	.697	.923
X20	173.8333	194.144	.477	.925
X21	173.6667	192.782	.584	.924
X22	173.7000	189.941	.576	.924
X23	173.7667	197.082	.288	.928
X24	173.5667	193.289	.539	.925
X25	173.4667	195.154	.529	.925
X26	173.6000	196.041	.394	.926
X27	173.5333	194.120	.537	.925
X28	173.9000	193.059	.622	.924
X29	173.3667	200.930	.171	.928
X30	173.2667	194.340	.569	.925
X31	173.4667	188.878	.779	.923
X32	173.6667	192.161	.571	.925
X33	173.4667	197.982	.286	.927
X34	173.6333	198.861	.271	.927
X35	173.9333	196.202	.374	.926
X36	173.9667	194.723	.434	.926
X37	173.7667	192.737	.569	.925
X38	173.8667	193.706	.477	.925
X39	173.4667	197.775	.363	.926
X40	173.4667	201.499	.151	.928
X41	173.3667	192.171	.668	.924

5.5 Result of Interview with the Manager

Face to face interview has been held with the manager of cinema of Jitra mall. He noted the importance and usefulness of the system prototype to the user. Then, he answered few questions on the usability performance of the MTMC feature of the prototype .The manager has responded yes for all the following questions

1. Is the MTMC reservation system useful and meets the administrator needs?
2. Is the web site for MTMC reservation system has been provided a flexible and easy way to enable the administrator to accomplish the functions?
3. Is the web site for MTMC reservation system provides useful information for the administrator?
4. Is the web site for MTMC reservation system support the user in (wap's part) to make booking via mobile phone?
5. Is the MTMC reservation system provides the users and the managers a clear guidelines interface?

5.6 Summary

This chapter focuses on the system analysis, from the testing and evaluation has been conducted, the prototype fulfils the user need requirements. The prototype still needs to be uploaded on Internet for further testing and real usage.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDED FURTHER STUDY

6.1 Introduction

This chapter will conclude the study by summarize and review the findings that found from the study and presenting research contribution, problems and limitations, and the direction of the future works.

6.2 Conclusion of the Study

As was presented in Chapter one, the objectives of this study are to design a Mobile Ticketing for malaysia's cinemas with kedah scope, and to develop the prototype and do usability testing. The prototype will help the customers to do their booking for the tickets easily anywhere at any time using their mobile phones and that will keep away them from all the problems that has been mentioned in chapter one.

6.3 Study Contribution

Mobile Ticketing for malaysia's cinemas helps the public by gaining an easier way to make their reservation by providing them with the necessary information of the ticketing and allow them to make reservation for watching movies. The MTMC

reservation system prototype was developed using J2EE plus jsp with respect to both parts (web part for the management of the kedah's cinemas and wap part for ability of user to booking), As with this system there will be a central control unit to manage cinemas to allow the user to roam and explore the available cinemas and films through mobile phone and with technology of the prepayment method. The study shows how the users can make their reservation and the results show how the users were satisfied with this system.

6.4 Problems and Limitations

While this system allows customers easier way for reservation, there are some significant shortcomings in the network of mobile booking systems which include the following:

1. Cost of service: when customers want to book tickets through mobile devices, it will cost them money for this service, but when they make their reservations to the traditional way do not cost them money just the ticket.
2. Developing WAP-pages with more complicated than developing pages for a standard Web browser because of restrictions on the size of the screen mobile space and internal memory in mobile devices. Under development, the developer should be concerned about the size of the screen. Where there are several studies has had assured for new versions for these issues especially with the new generation of WAP version 2.
3. WAP and Web prototype of the prototype had been tested using a local server, the Apache Jakarta Tomcat and Pocket PC Browser for web and wap

parts in order, and also hosted the prototype in free online server, but with limited resources and with high level of policy for mobile telecommunication server, there is no actual mobile company web server can be used in testing the prototype.

6.5 Future Works

The Mobile ticketing for malaysia's cinemas prototype is to enable the customers to reserve tickets they want as well as necessary information and speed. A lot of works still need to be done on this reservation system in the future such as expand the scope to include all the malaysia's cinemas, examine whether there are other means appropriate for payment methods, and sending messages from the administrator to the customer if there are some changes happened with the ticket information to inform him/her about these changes.

6.6 Recommendation

In my opinion and as I see no one can deny the importance of the mobile technology it is become as the backbone of our society, we must make the uses of the mobile to be more wide in all the area because it is make every thing easy and fast to be done.

REFERENCES

Ahmad, W. (2008). Is Credit Card Fraud a Real Crime?Does It Really Cripple the E-commerce Sector of E-business? *IEEE, 978-0-7695-3366-7/08*.

Ardakan, M. A., & Mohajeri, K. (2009). Applying Design Research Method to IT Performance Management: Forming a New Solution. *Applied Sciences*.

Aungst, S.G., Wilson, D.T. (2005),. A primer for navigating the shoals of applying wireless technology to marketing problems. The Journal of Business and Industrial Marketing, *20(2), 59*

Carlsson, C., Carlsson, J., & Walden, P. (2004). MOBILE SERVICES FOR THE HOSPITALITY INDUSTRY.

Cater-Steel, A., & Al-Hakim, L. (2008). *Information Systems Research Methods, Epistemology, and Applications.*

Chen, C.-T., & Lu, T.-C. (2004). A Mobile Ticket Validation by VSS Tech with Time-Stamp. *IEEE, 0-7695-2073-1/04*(International Conference on e-Technology, e-Commerce and e-Service), 4.

Chun, H.-J., & Wei, J. (2004). DEVELOPMENT OF INTERFACE FEATUREBASED M-TICKET FRAMEWORK FOR AIR TRAVEL INDUSTRY. *EDSIG*.

Computing, M. (2005). WAP. Retrieved 3/1/2009, from http://searchmobilecomputing.techtarget.com/sDefinition/0,,sid40_gci213337,00.html

Daintith, J. (2009). "system design", A Dictionary of Computing Retrieved 3-3-2009, from http://www.encyclopedia.com/doc/1O11-systemdesign.html

DZNet. (2007). Electronic-COMMERCE. Retrieved 3/1/2009, from http://dictionary.zdnet.com/definition/e-commerce.html

Egeberg, M. (2006). *The mobile phone as a contactless ticket.* Norwegian University of Science and Technology.

Ellis, G. (2003). Apache Jakarta Tomcat. Retrieved 22/2/2009, from http://www.wellho.net/forum/The-Java-Programming-language/Apache-Jakarta-Tomcat-Catalina-Coyote-Jasper.html

Field, A. (2006). Reliability Analysis: Measurement of Reliability.

Goliath. (2007,July). Airline Finance News- North America. Retrieved 13/3/2009, from http://goliath.ecnext.com/coms2/gi_0199-6747912/Airline-Finance-News-North-America.html#abstract

Grosche, S. S., & Knospe, H. (2000). Secure M- Commerce. *IST*.

Group, N. (1999). *Getting Started Nokia WAP Toolkit* o. Document Number

Hampe, J. F., Schubert, P., & Schneider, F. (2004). *Mobile Community Support:A Mobile Reservation System For The Leisure Industry*. Paper presented at the Bled eCommerce Conference.

Heidemann, M. (2004). No mobile Internet without WAP [Electronic Version]. Retrieved 22/2/2009, from http://www.vodafone.com/flash/receiver/04/articles/pdf/06.pdf

Hesterbrink, C. (1999). E-Commerce and ERP: Bring Two Paradigms Together, Price Waterhouse & Cooper.

Holzinger, A. (2005). Usability Engineering Methods for Software Developers. *ACM, 48*, 4.

Hrabe, D. P., & Gazda, R. B. (2004). Igniting the SPARK: Supporting the Technology Needs of Online Learners.

Hussin, W. H. W., Coulton, P., & Edwards, R. (2005). Mobile Ticketing System Employing TrustZone Technology. *IEEE, 0-7695-2367-6/05*(Proceedings of the International Conference on Mobile Business), 4.

J.K.Choi, J.S.Park, J.H.Lee, & K.S.Ryu. (2006). Key factors for e-commerce business success. *IEEE, 89-5519-129-4*.

Järvinen, P. (2005). *Action research as an approach in design science*. Paper presented at the European Academy of Management, EURAM.

Jason, P. (2006, December 6). Mobile Search Optimization. Retrieved 22/3/2009, from http://www.seroundtable.com/archives/006868.html

Jiang, H. (2008). Study on Mobile E-commerce Security Payment System. *IEEE, 978-0-7695-3258-5/08*.

Jones, R. (2004). Creating Web Content for Mobile Phone Browsers, Part 2

Joseph, A. D., J. A. Tauber, and M. F. Kaashoek (1997). Mobile Computing with the Rover Toolkit. *IEEE* Transactions on Computers, 46(3), 337-352.

K.B, S., & Agarwal, nd: A. *Mobile Payments: Six Issues*

Khosrowpour, M. (2006). *Emerging Trends and Challenges in Information Technology Management: Information Resources Management Association International Conference*.

Kim, L., & Albers, M. J. (2001). Web design issues when searching for information in a small screen display. Paper presented at the 19th Annual (International Conference on Computer Documentation), Sante Fe, New Mexico, USA

Kumar, V., Parimi, S., & Agrawal, D. P. (2003). WAP: Present and Future. *IEEE, 1536-1268/03*(Communications Society).

Lee, C. w., Hu, W. C., & Yeh, J. h. (2003). A System Model for Mobile Commerce. *IEEE, 0-7695-1921-0/03*(International Conference on Distributed Computing Systems Workshops).

LEE, I. (2002). Wireless Access Protocol(WAP) architecture.

Lewis, J. R. (1993). *IBM Computer Usability Satisfaction Questionnaires:Psychometric Evaluation and Instructions for Use*. (IBM o. Document Number)

Lin, H. X., Choong, Y.-Y., & Salvendy, G. (1997). A Proposed Index of Usability: A Method for Comparing the Relative Usability of Different Software Systems *Taylor & Francis, 16*, 267-278

Lund, A. M. (2001). Measuring Usability with the USE Questionnaire. STC Usability SIG Newsletter. Retrieved 5/3/2009, from http://hcibib.org/perlman/question.cgi?form=USE

Mallat, N., Rossi, M., Tuunainen, V. K., & Öörni, A. (2006). The Impact of Use Situation and Mobility on the Acceptance of Mobile Ticketing Services. *IEEE, 0-7695-2507-5/06*(International Conference on System Sciences), 10.

Mallat, N., Rossi, M., Tuunainen, V. K., & rni, A. O. o. (2008). An empirical investigation of mobile ticketing service adoption in public transportation. *Springer*, 9.

Mattila, K. V., Oksman, V., & Vainio, T. (2007). Exploring the User Experience Factors in Designing Successful Mobile Internet Services for Business Use. *MobileHCI'07*.

Me, G. (2003). Security overview for m-payed virtual ticketing. *IEEE, 0-7803-7822-9/03*.

Mediabuyerplanner. (2006). Growing Number of Mobile Device Internet Users in Europe, Asia. Retrieved 22/3/2009, from http://www.mediabuyerplanner.com/2006/04/21/growing_number_of_mobile

Nielsen, J. (2003). Introduction to Usability. Retrieved 3/1/2009, from http://www.useit.com/alertbox/20030825.html

Pandelidis, A. (2006). Defining the security required for WAP based Mobile ticket sales. *ACM, 1-59593-604-1/06/00010*.

Parsons, T. (2000, November 6). E-tickets suit some travelers. Retrieved 13/3/2009, from http://www.highbeam.com/doc/1G1-66651736.html

TEO, T. S. H., & POK, S. H. (2003). Adoption of the Internet and WAP-enabled phones in Singapore. *Taylor & Francis, 22*.

TM, C,.nd. Complete WAP Security [Electronic Version], Retrieved 5/3/2009 from http://www.comms.scitech.susx.ac.uk/fft/networking/WAPsec.pdf

Tweed, D. (2001). Mobile Ticketing.

Vaishnavi, V., & Kuechler, W. L. (2004). Design Research in information system. Retrieved 13/8/2008, from http://www.isworld.org/Researchdesign/drisISworld.htm

Wan, G. H., & Che, P. (2004). Chinese Air Travelers' Acceptance towards Electronic Ticketing. *IEEE, 0-7803-8519-5/04*.

Yu, C. H. (2000). An introduction to computing and interpreting Cronbach Coefficient Alpha in SAS.

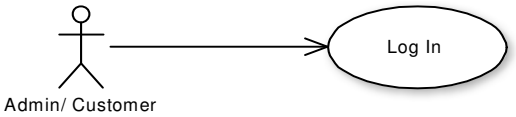
Zhongjun, L., Lijuan, H., & Qihai, Z. (2008). The Reconstruction, Exploration and Innovation of Logos of E-commerce. *IEEE, 978-0-7695-3258-5/08*.

Zwass, V. (1998). Structure and Macro-Level Impacts of Electronic Commerce: Technological Infrastructure to Electronic Marketplaces. K.E. Emerging Information Technology, Kendall: Sage Publications

APPENDIX A

Use Case Specifications

1. **Use case: Login**



1.1 Brief Description

This use case is initiated by the administrators and customers. The administrators and customers will establish their tasks after the login process successful.

1.2 Pre-Condition

- Insert the username and the password.
- Press the login option.

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- The user (administrators and customers) access the login page (Web, Wap) in order.
- The user (administrators and customers) insert the username and the password to login.
- The users press the login button to match it with the user database.
- System will send the user to his page.

1.4.2 Alternative Flow

The user can decide to cancel the operation.

1.4.3 Exceptional Flow

Wrong username and password: The system shall display the message "wrong username and password".

1.5 Post-condition

- Login to the user page
- View the user page option

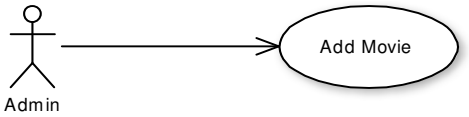
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

User ID and Password

2. Use case: Add Movie



1.1 Brief Description

This use case is initiated by the administrator to add Cinema's movies. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the add cinema's movie.
- System response for check the permission of add cinema's movie.
- The administrator fills the options forms.
- The administrator press the submit button.
- System saves the entered data in database and show message added successful.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

If administrator did not enter all cinema information such as movie name, ticket price and time and so on, the system shall display the message "Please fill all information".

1.5 Post-condition

Add new cinema's movie data

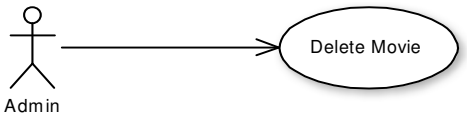
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

3. Use case: Delete Movie



1.1 Brief Description

This use case is initiated by the administrator to delete Cinema's movies. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the delete cinema's movie.
- System response for check the permission of delete cinema's movie.
- The administrator fills the options forms to determine movie.
- The administrator press the submit button.
- System check if movie exist or not, if exist system retrieve all related movie's information to confirm delete operation.
- Administrator accepts confirmation operation.
- System deletes data from database and show message deleted successful.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

If administrator enters not exist cinema's movie information, the system shall display the message "Data Not found ".

1.5 Post-condition

Delete cinema's movie data.

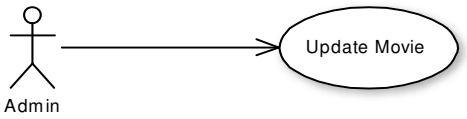
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

4. Use case: Update Movie



1.1 Brief Description

This use case is initiated by the administrator to update cinema's movies. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the Update cinema's movie.
- System response for check the permission of update cinema's movie.
- The administrator fills the options forms to determine movie.
- The administrator press the submit button.
- System check if movie exist or not, if exist system retrieve all related movie's information and make it available to update.
- Administrator enters new data that he wants to update.
- System saves the entered data in database and show message updated successful.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

If administrator enters not exist movie information, the system shall display the message "Data Not found ".

1.5 Post-condition

Update cinema's movie data

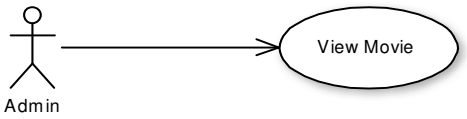
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

5. **Use case: View Movie**



1.1 Brief Description

This use case is initiated by the administrator to View cinema's movies. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the view cinema's movie.
- System response for check the permission of view cinema's movie.
- The administrator fills the options forms.
- The administrator press the submit button.
- System check if movie exist or not, if exist system show all related movies information.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

If administrator enters not exist movie information, the system shall display the message "No data found ".

1.5 Post-condition

View cinema's movie data

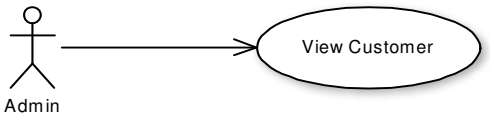
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

6. **Use case: View customer profile**



1.1 Brief Description

This use case is initiated by the administrator to view customer. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the view customer.
- System response for check the permission of view customer.
- The administrator fill customer id.
- The administrator press the submit button.
- System check if customer id exist or not, if exist system show all related movies information.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

If administrator enters not exist customer id, the system shall display the message "No data found ".

1.5 Post-condition

View customer data

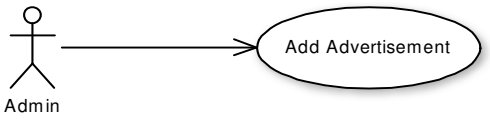
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

7. **Use case: Add Advertisement.**



1.1 Brief Description

This use case is initiated by the administrator to add advertisement. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the add advertisement.
- System response for check the permission of add advertisement.
- The administrator fills the options forms.
- The administrator press the submit button.
- System saves the entered data in database and show message added successful.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

If administrator did not enter all advertisement information, the system shall display the message "Please fill all information".

1.5 Post-condition

Add new advertisement data.

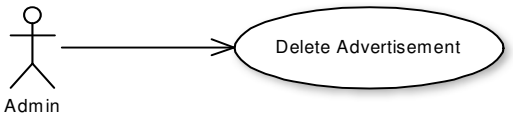
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

8. Use case: Delete Advertisement



1.1 Brief Description

This use case is initiated by the administrator to delete advertisement. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the delete advertisement.
- System response for check the permission of delete advertisement.
- The administrator selects advertisement.
- The administrator press the submit button.
- System deletes data from database and show message deleted successful.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

Not applicable

1.5 Post-condition

Delete advertisement data

1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

9. Use case: Update Advertisement

1.1 Brief Description

This use case is initiated by the administrator to update advertisement. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the update advertisement.
- System response for check the permission of update advertisement.
- The administrator selects advertisement.
- The administrator press the submit button.
- System retrieves all related advertisement information and makes it available to update.
- Administrator enters new data that he wants to update.
- System saves the entered data in database and show message updated successful.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

Not applicable.

1.5 Post-condition

Update advertisement data

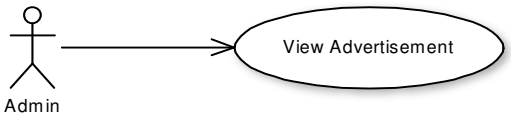
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

10. Use case: View Advertisement



1.1 Brief Description

This use case is initiated by the administrator to view advertisement. The administrator will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the administrator page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Administrator selects the view advertisement.
- System response for check the permission of view advertisement.
- System shows all available advertisement.

1.4.2 Alternative Flow

The administrator can decide to cancel the operation.

1.4.3 Exceptional Flow

Not applicable.

1.5 Post-condition

View advertisement data

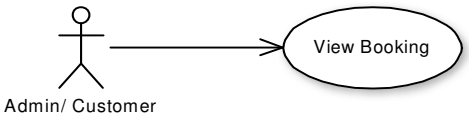
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

11. Use case: View Booking



1.1 Brief Description

This use case is initiated by the user (administrator or customer) to view booking ticket's information. The administrator and customer will establish his/her tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to user page

1.3 Characteristics of Activation

This execution depends on user (administrator or customer) demand.

1.4 Flow of event

1.4.1 Basic Flow

- User (administrator or customer) selects the view booking.
- System response for check the permission of view booking.
- The administrator enters booking ticket's number, but customer selects the ticket's date.
- The user (administrator or customer) press the submit button.
- In administrator case system check if ticket's number exist or not, if exist system show all related ticket's number information. In customer case the system check if customer has ticket in specific date or not.

1.4.2 Alternative Flow

The user (administrator or customer) can decide to cancel the operation.

1.4.3 Exceptional Flow

- If administrator enters not exist ticket's number, the system shall display the message "No data found".
- The system shall display the message "No data found". If there is no ticket for customer in specific date.

1.5 Post-condition

View ticket's information.

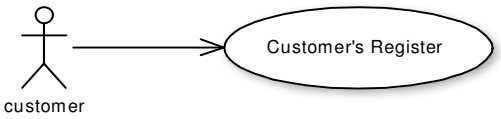
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

12. Use case: Customer's Register



1.1 Brief Description

This use case is initiated by the customers to new register. The customers will establish their tasks after the register successful.

1.2 Pre-Condition

- Insert the customer information.
- Press register.

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- The customers access the register page.
- The customers insert his/her information to register.
- The customers press the submit button.
- System saves the entered data in database and show message "thanks for registration please return home to start login"

1.4.2 Alternative Flow

The user can decide to cancel the operation.

1.4.3 Exceptional Flow

Not applicable.

1.5 Post-condition

- Register new customer.

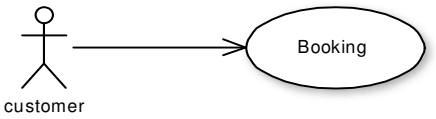
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

13. Use case: Booking



1.1 Brief Description

This use case is initiated by the customer to make booking ticket cinema by using his/her mobile phone. The customer will establish his/her tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the customer page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Customer selects booking.
- The customer determines his/her destination for booking information such as city name, cinema name, and date.
- System response for check the permission of booking.
- The customer press the submit button.
- System check if there is available movie or not, if exist system retrieve all movie's information that are available and show it.
- Customer selects which movie he/she like to watch and select the seat number.
- The system will checking customer's balance if it is cover the amount of ticket or not. Then the system will checking the chosen seat if it is available or not.
- The system will create ticket's No. and save the booking ticket information such as city name, cinema name, move name and time etc. As well as ticket's No. then showing ticket to the customer.

1.4.2 Alternative Flow

The customer can decide to cancel the operation.

1.4.3 Exceptional Flow

- If customer selects booking information but it is not touch any available movie, system shall display the message "No available movie"

- If customer account does not cover the ticket value, system shall display the message "Your balance not enough to pay ticket amount "
- If the seat is not available, system shall display the message "the seat is not available".

1.5 Post-condition

Booking mobile e-ticket for cinema

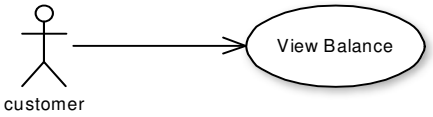
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

14. Use case: View Balance



1.1 Brief Description

This use case is initiated by the customer to view his/her balance. The customer will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the customer page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Customer selects the view balance.
- System response for check the permission of view balance.
- System shows customer's balance.

1.4.2 Alternative Flow

The Customer can decide to cancel the operation.

1.4.3 Exceptional Flow

Not applicable.

1.5 Post-condition

View information customer's balance.

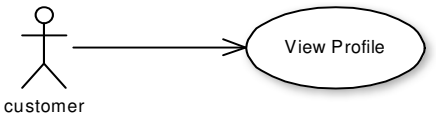
1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

15. Use case: View Profile



1.1 Brief Description

This use case is initiated by the customer to view his/her profile. The customer will establish his tasks after the login process successful.

1.2 Pre-Condition

Successful accessing to the customer page

1.3 Characteristics of Activation

This execution depends on user demand.

1.4 Flow of event

1.4.1 Basic Flow

- Customer selects the view profile.
- System response for check the permission of view profile.
- System shows customer's profile.

1.4.2 Alternative Flow

The customer can decide to cancel the operation.

1.4.3 Exceptional Flow

Not applicable.

1.5 Post-condition

View information of customer's profile.

1.6 Rule(S)

Not applicable.

1.7 Constraint (S)

Not applicable.

APPENDIX B
Manual Web Site Part

The home page for MTMC as show in figure 1, the admin for each cinema can access the home page and login by use his/her ID and password, without login no one can explore the page links and will get message that you must login first except the home and about us links.

Figure 1: Web Home Page

About as page as show in figure 2

Figure 2: About us Page

Admin has to enters the own ID and password then press login as show in figure 3, after successful login welcome page will appear with the name of the city's and cinema's admin as in figure 4, then the admin will return back to the home page to accomplish his/her tasks by manage cinema movies, advertisement, view book and view customer profile.

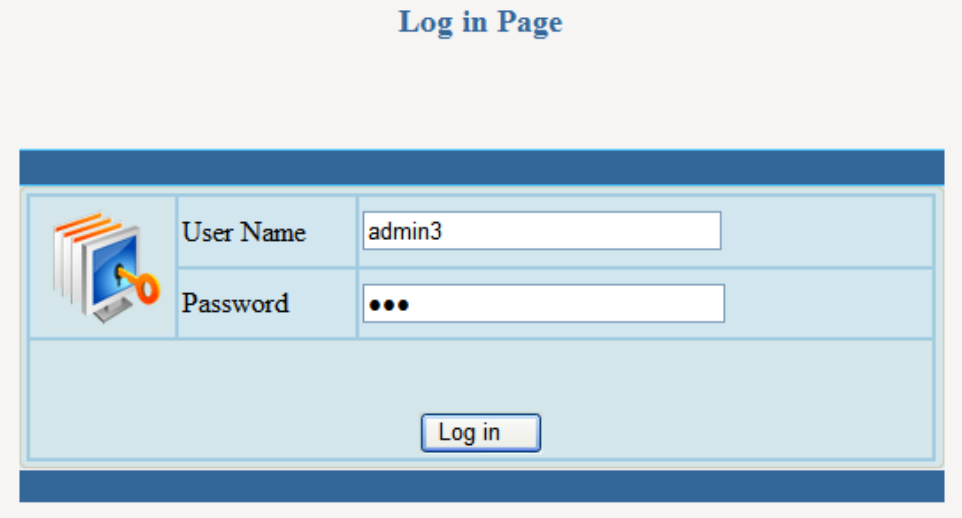


Figure 3: Login Page

Figure 4: Successful Login Message

The most important task for the cinema's admin is to manage the movies of cinema, figure 5 will appear when admin pressed cinema's link in home page. Admin can add, delete, update, view movie of this cinema.

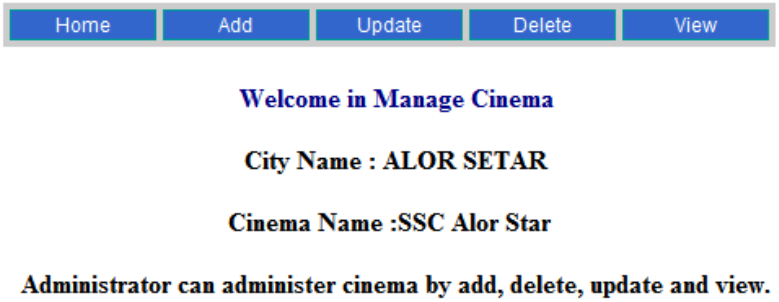


Figure 5: Cinema Page

To add new movies, figure 6 will appear after pressed add in the cinema main bar, the admin have to enter all cinema's movies information, these movies will be available to user in the wap part to booking ticket.

Figure 6: Add Cinema Page

To update movie's information, figure 7 will appear after pressed update in the cinema main bar, the admin has to choose the movie, which wants to update.

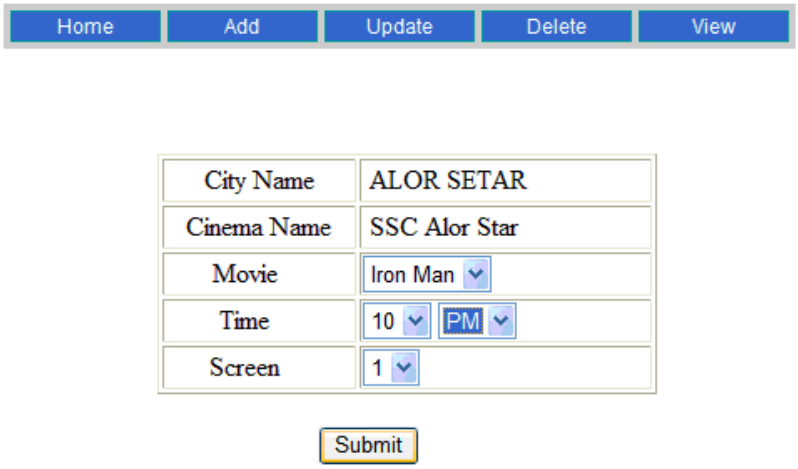


Figure 7: Update Cinema Page

Then the movie will be available to update as in figure 8

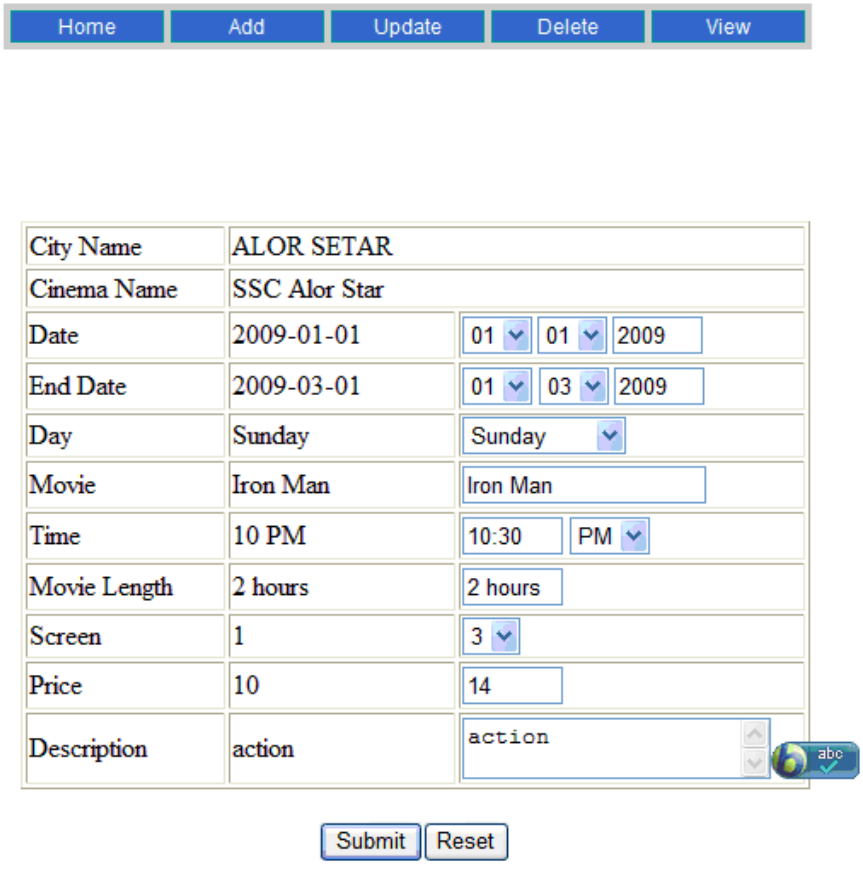


Figure 8: Set Update Cinema Page

To delete movie, figure 9 will appear after pressed delete in the cinema main bar, the admin has to determine the movie, which wants to delete.

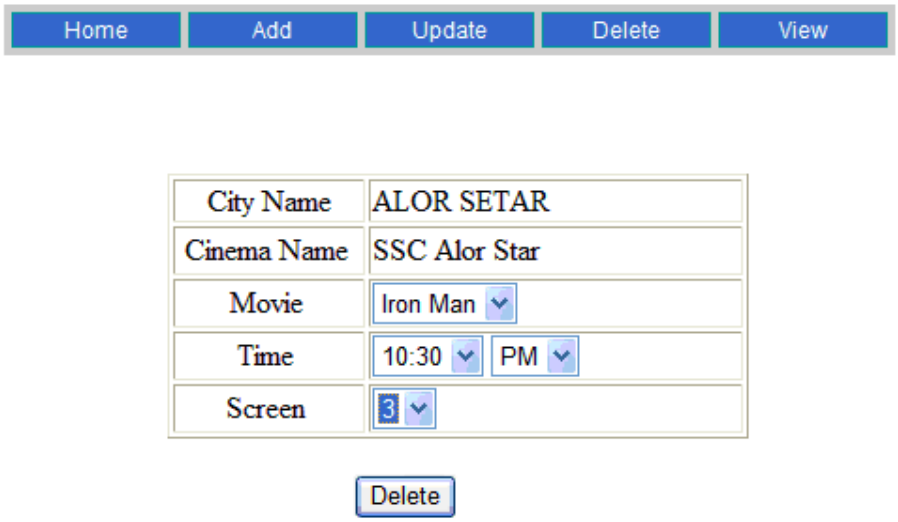


Figure 9: Delete Cinema Page

Then figure10 will appear to confirm the deletion of this movie.

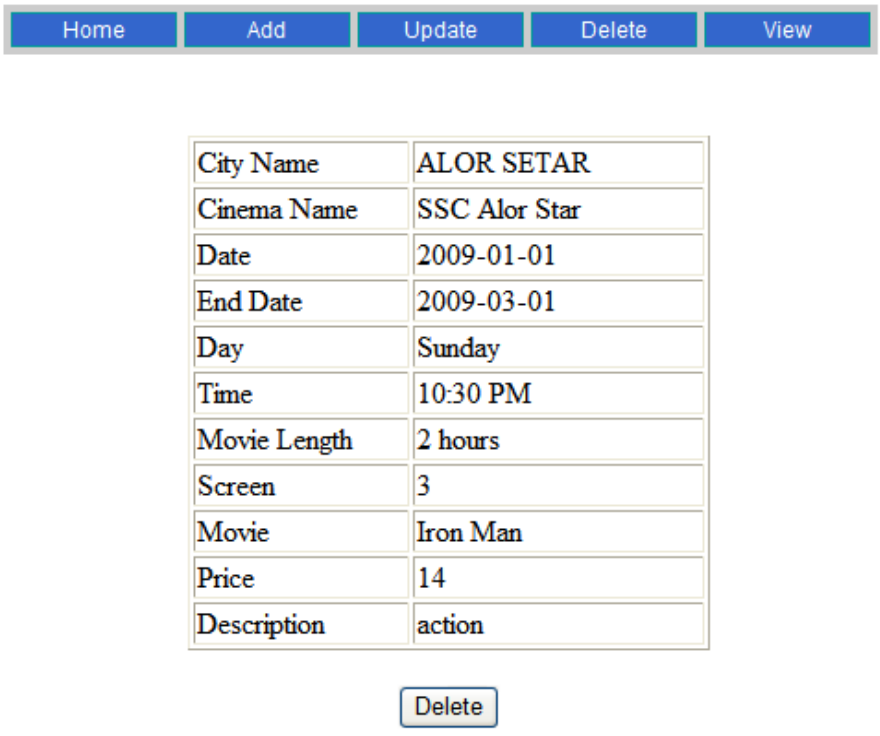


Figure 10: Confirm Delete Cinema Page

To view movies, figure 11 will appear after pressed view in the cinema main bar; the admin has to determine the date, to see the available movies.

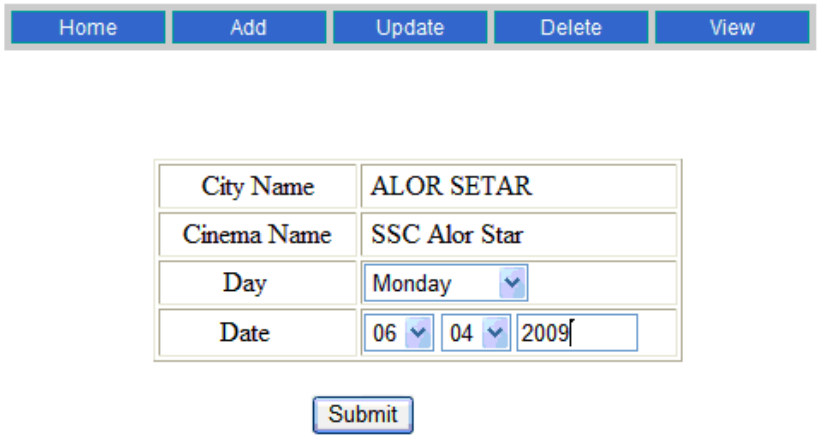


Figure 11: View Cinema Page

Then figure12 will appear to display the available movies

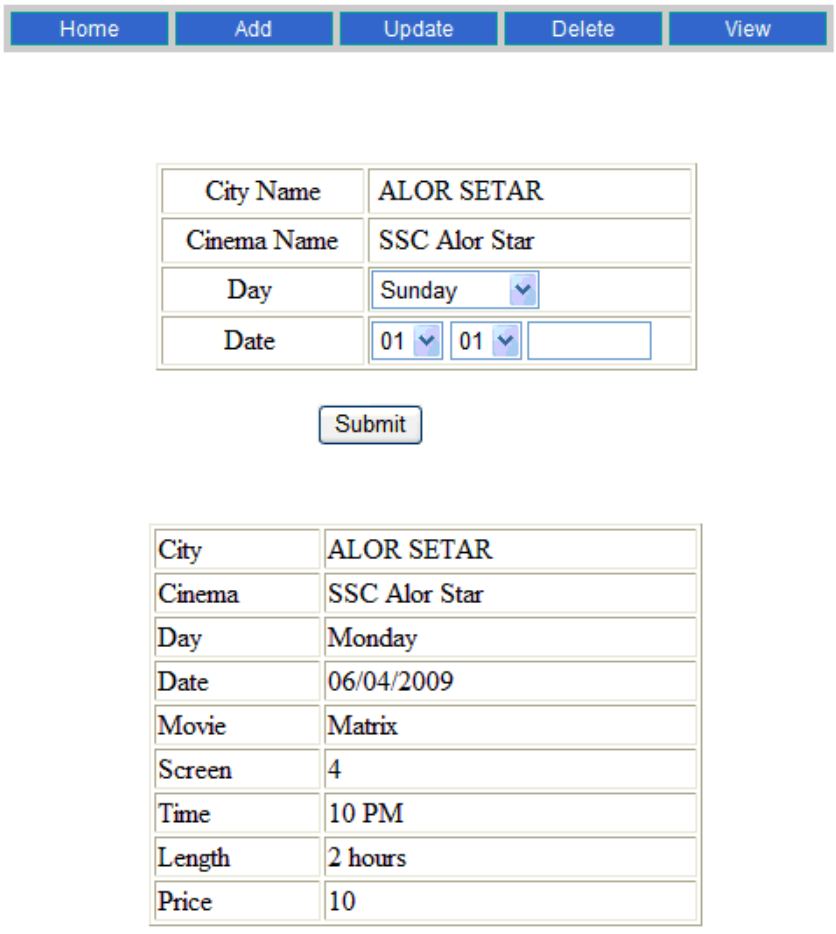


Figure 12: Result View Cinema Page

To add new advertisement, figure 13 will appear after pressed add in the advertisement main bar, all advertisements for all cinemas will be displaying in home page.

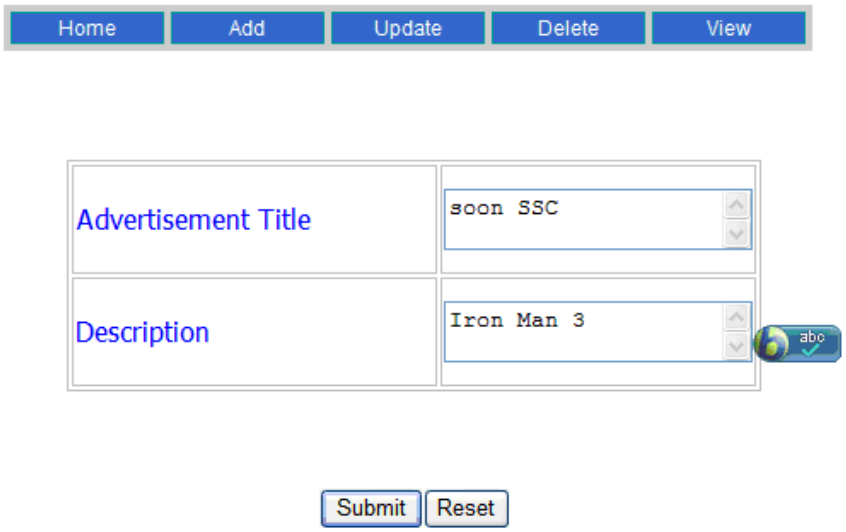


Figure 13: Add Advertisement Page

To update advertisement, figure 14 will appear after pressed update in the advertisement main bar, the admin has to select the advertisement, which wants to update.

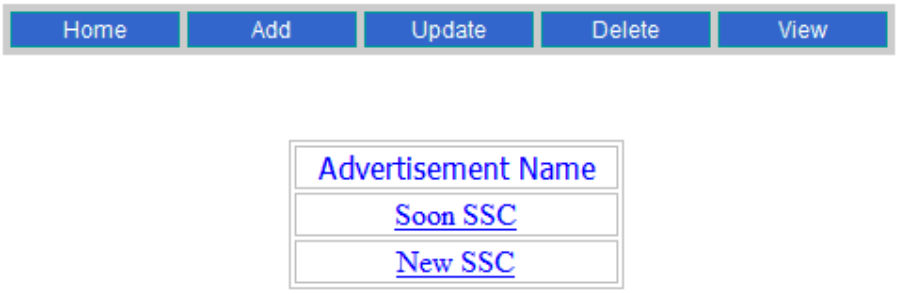


Figure 14: Update Advertisement Page

Then the advertisement will be available to update as in figure15

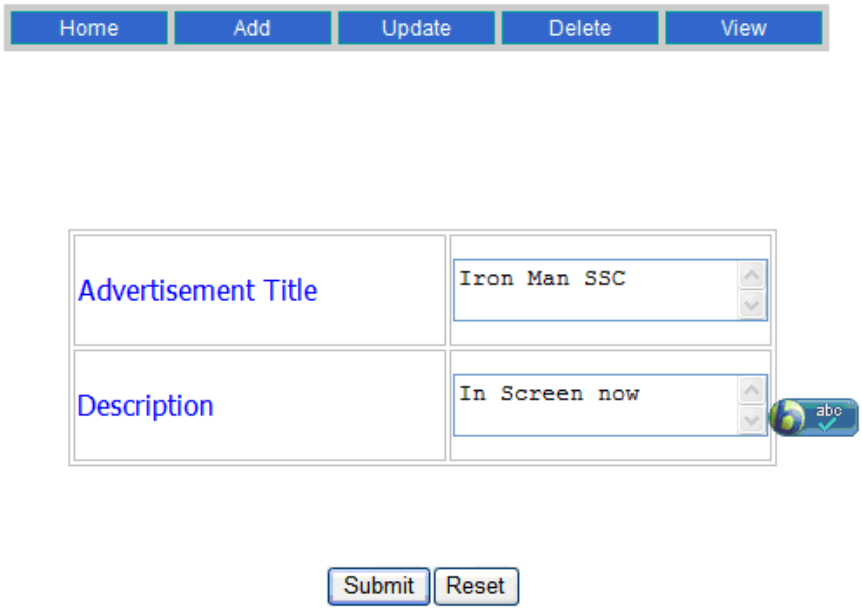


Figure 15: Set Update Advertisement Page

To delete advertisement, figure 16 will appear after pressed delete in the advertisement main bar, the admin has to select the advertisement, which wants to delete.

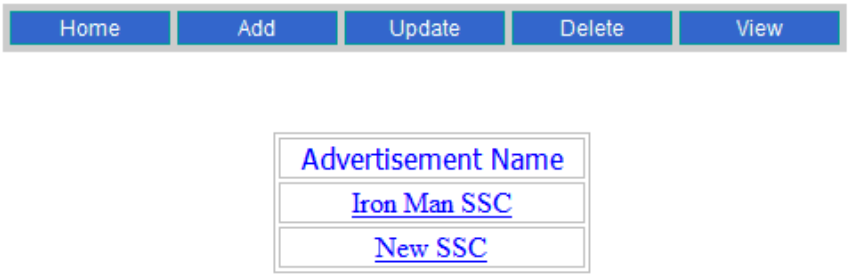
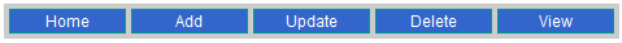


Figure 16: Delete Advertisement Page

Then figure17 will appear to display the available advertisement for this cinema.



NO	Advertisement Title	Description
1	Iron Man SSC	In Screen now
2	New SSC	Action

Figure 17: view Advertisement Page

Finally when the customer has been booked by MTMC reservation system and he/she came to watch his/her movie, they will ask for their ticket, admin will be checking the ticket number by press view book in home page as in figure 18

Figure 18: View Booking Page

If they inserted wrong ticket number, they will get message "no available ticket". Otherwise they will get the ticket information then user can get his/her cinema ticket to watch movie as show in figure 19.

Figure 19: View Ticket Info. Page

Also admin can view customer profile by press view customer from home page as in figure 20

Figure 20: View Customer Profile Page

If customer not exists in this service they will get message "no customer found" otherwise will get customer information

Figure 21: Result View Customer Profile Page

APPENDIX C

Questionnaire

A. General information

Please kindly tick (√) your answers to the given statements.

1. What is your GENDER?

   [ ] Male [ ] Female

2. What is your AGE group?

   [ ] <15 Years old [ ] 15-20 Years old

   [ ] 21-30 Years old [ ] 31-40 Years old

   [ ] 41-60 Years old [ ] > 60 Years old

3. What is your Race?

   [ ] Malay [ ] Chinese

   [ ] Indian [ ] Other

   Other (please specify)…….

4. Marital Status

   [ ] Married [ ] Single

5. Is your Education IT related?

   [ ] Yes [ ] No

6. Do you use a mobile phone?

   [ ] Yes [ ] No

7. Do you use WAP?

   [ ] Yes [ ] No

B: Questions

Please check the appropriate column. The numbers 1 to 5 represent the following:

1= Strongly Disagree; 2= Disagree; 3= Not Sure 4= Agree; 5= Strongly Agree

	Usefulness of MT-MC	**1**	**2**	**3**	**4**	**5**
1	It is useful.					
2	It saves my time when I use it.					
3	It saves my effort when I use it.					
4	It meets my needs.					
5	It gives me more control over the activities in my life.					
6	It makes the things I want to accomplish easier to get done.					
7	It does everything I would expect it to do.					

	Ease of use and learning of MT-MC	**1**	**2**	**3**	**4**	**5**
8	It is easy to use.					
9	It is flexible use.					
10	It is simple to use.					
11	It is user friendly.					
12	It requires the fewest steps possible to accomplish what I want to do with it.					
13	I can use it without written instructions.					
14	I can recover from mistakes quickly and easily.					
15	I don't notice any inconsistencies as I use it.					
16	I learned to use it quickly.					
17	I easily remember how to use it.					
18	I can use it successfully every time.					

User Guidance		1	2	3	4	5
19	System feedback: It is helpful in the error message					
20	It provides explicit entry of corrections.					
21	It is indicated for completion of processing.					
22	My mistakes were easy to correct.					
23	I always felt I knew what it was possible to do next.					

Flexibility of MT-MC		1	2	3	4	5
24	The design for data entry flexible.					
25	It provides flexible user guidance.					
26	The menu options dependent on context.					
27	It is easy to remember where to find things.					
28	It is easy to find my way around system.					
29	I can get information quickly.					
30	Information is easy to read.					

Using MT-MC (Satisfaction)		1	2	3	4	5
31	It was simple to use mobile reservation system for kedah's cinema.					
32	This system gives error messages that clearly tell me how to fix problems.					
33	The information provided for mobile reservation is easy to understand.					
34	The organization of information on the system screens is clear					
35	Mobile reservation system has all the functions and capabilities I expect it to have.					
36	It works the way I want it to work.					
37	I liked using the interface of this system					
38	I feel comfortable using this system.					
39	I feel I need to have it.					
40	The system content interests me.					
41	Overall, I am satisfied with mobile reservation system for cinema's kedah.					