

Mobile Reservation in Leisure, Hospitality and Transport Industry

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Abstract. With the advent of ubiquitous computing, programmers considered it a viable alternative for developing applications to be used in our day-to-day activities. This research introduces a Mobile Reservation Management System for Leisure, Hospitality and Transport Industries to provide the teaming populace with flexibility in booking for services without losing time and effort. People usually book or reserve tickets or seats manually from the counters or online from their homes or offices, these processes are tiresome because the huge number of people, as it is time consuming to wait in queues. The Mobile Reservation Management System (MRMS) is aimed at converting the simple, manual and electronic services into mobile electronic services, for full utilization of the mobility solutions which made things easier to obtain, anytime and anywhere. This paper deems it feasible to utilize the technology in developing reservation services for Restaurants, Cinemas and Facilities to mention but few.

Keywords-Mobile, Reservation, J2ME, JSP, XML, WAP, CDCL, CDC

1. Introduction

The wireless technology is the most interesting technology in the ICT industry today, where there is much innovation and research. According to Chipangura et al., as technology developed through time, advances in telecommunication and computer hardware knowledge have led to the emergence of mobile computing [1].

According to Pade et al, Mobile computing provides instant deployment of service over a large geographical area and offers every user many services. Information Communication Technologies (ICTs) play a significant role in enhancing developing countries [2].

Mobile technology's rapid growth has facilitated our daily activities; it has also played an important role in the management of relations between people's social and economic relations.

Moreover, the evolution and relevance of this technology gave a new face of communication between people and opening a prospectus for continuing them. Indeed, the wide spread usage of mobile technologies for the past decade revolutionize the way people thing and communicate.

The revolution in mobile device and increase in mobile users worldwide attracted the attention of researchers and developers in satisfying the needs of the mobile device users in making it more convenient, secured, portable, accessible and seamless.

As asserted by Carlsson et al., the integration of ideas by researchers, developers and manufacturers succeeded in making mobile phones not only for making and receiving calls to any further extent by presenting many additional facilities, services and techniques. In recent years, mobile phones have gone from being a mere voice-service to smart-phones and now becoming multipurpose platform devices.

Previously the interest was given to transfer of services to the internet environment and make them 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 [3].

Also asserted by Mattila et al., more recently, the development of mobile internet services has introduced great potential for benefiting businesses in different fields. 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 [4].

The emerging technology behind M-Commerce is based on the Wireless Application Protocol (WAP). Michael Heidemann, product manager for Nokia Mobile Phones Sales. "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" [5].

Findings by Teo&Pok 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 [6].

2. Related Work

Mobile Reservation gained prominence in the early 90s, with the advent of GPRS and WAP technologies, enabling mobile users to make reservations online. Recently, the WAP technology was ousted by the J2ME technology since it provides more secured environment for transaction. Nowadays the technology is far more than reservation; it has improved to m-ticketing and m-payment.

Mobile reservation, ticketing and payment have been introduced in different services, such as Bus, Cinema and Restaurant reservation, ticketing and payment.

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. Mobile ticketing contains many applications such as follows [7]

- 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 [8].

According to Pandelidis, using m-ticket could reduce the time for waiting and the risk of storing tickets[9]. 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-commerce service for issue, and the customer as a user. The m-ticket transaction model has a lot of benefits for consumers and merchants.

Also in 2004 Tweed said, “Mobile ticketing (m-ticketing) attacks many real problems by providing a way for mobile phone users to buy tickets from their mobile handsets” [10]. 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 too 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.

Findings by Mallat et al., 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[12]. 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.

Also in 2008 Mallat et al., 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[13]. In addition the 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.

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[14]. 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.

In 2006Hussin et al., proposed and implemented a ticket-based mobile service system for mobile users via SMS system[15]. The ticket-based mechanism is implemented allowing the user to identify the service providers’ effort when they pay them. Moreover, the study concluded that tickets provide a flexible and scalable mechanism for mobile access. The main contributions of the study are that the scheme is a global ticket-based solution for mobile service, an anonymous and dynamic system, and new users and new service providers can join at anytime. It is also scalable and users can check charges at anytime.

In this context, mobility is the crucial part of the work, this research proposed a Mobile Reservation Management System using J2ME client, the system contains two parts, first is an web-based backend to manage and store reservations in the database, the second part is the J2ME client application for making the reservation.

3. The Proposed System

The proposed system is to allow mobile user access to services offered by different companies. The system is focused on leisure, entertainment and transport industries, such as cinemas, restaurants, bus and train service to mention but few.

The system development is divided into two parts – the J2ME client part for the consumer and the server side which is Web-based, manages and process input from the consumer and the service providers respectively, Figure 1 represents the system architecture.

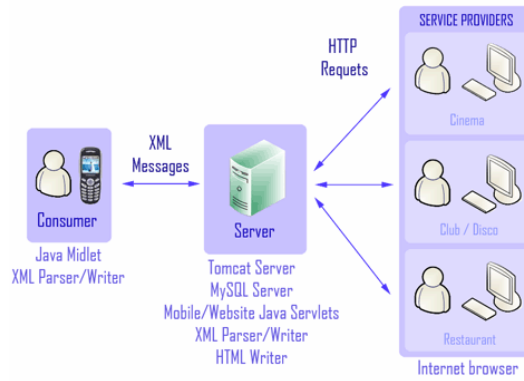


Figure 1. System Architecture

Java 2 Micro Edition (J2ME) is aimed at small and memory constrained devices and standardize the use of Java technology in wireless and portable devices. The J2ME architecture is modular and scalable due to the diversity of target devices because it provides a range of virtual machines each optimized to the different processor types and memory footprints.

I chose J2ME for the application development due to some of its advantages that include improved security and consistency of applications across platforms and devices, superior user interface with graphics, the ability to function offline out of wireless coverage, peer-to-peer networking and robustness.

The architecture is simple, a main server processing both inputs, from providers and from users. The communication between users and the server was made using custom xml messages managed by a servlet. In the other hand the providers access to their custom services page using simple website.

The server side uses Tomcat to run the servlets that runs two servlets needed by the project – the servlet_service and the servlet_server for building the service providers' website and for communication with mobile phone respectively.

4. Conclusion

In this paper we tried to point out the use of mobile reservation in leisure, hospitality and transportation sectors, its advantages, limitations and how it can help both consumers and service providers to effectively book and receive reservations anywhere, anytime respectively.

Mobile Reservation Platform is expected to help the public by gaining an easier way to make their reservation by providing them with flexibility in making reservation and allow them to make bookings for different services in one connection. Through the testing and evaluation conducted, the proposed system fulfills the requirements needed by the mobile user. However, some improvements have to be made on the aesthetic of the system, to make it more user-friendly by adding images and colors and graphics.

Evaluation performed after the system development determined the level of usefulness and operability of the system, it is tested through usability testing. The system was tested by 5 people each person tested the functionality of both the client and server sides of the system. The aim was to see the level of satisfaction and perception of the system's ease of use and operability.

5. Future Work

As the growing capabilities of mobile devices; PDAs, smartphones and mobile phones are always on the move to higher ends, the evolution of the internet and need for global collaborations, this system can also be improved to accommodate new trend in the technological world and important features such as payment gateway.

In the future the system can be improved to be able to generate barcode, send SMS and accept credit card payments.

With the successful implementation and evolution of 3G to 4G networks in the telecommunication sector, the system will be expected to involve the use of Mobile wallet and Felica Card.

Furthermore, introduction of secured transaction such as the SSL can be seen as another improvement to take into account because nowadays fraud is rampant in both mobile and electronic commerce.

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