

# Dynamic WAP (Wireless Application Protocol) Page Generation: A Proposed Solution for Small mobile Screen and Usability Issues

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## ABSTRACT

**CONTEXT:** Mobile commerce (M-Commerce) is a new commerce pattern in which the purchasing and vending of goods and services is completed through mobile apparatus. Or M-commerce is a business concept, which covering any practice of business transaction or information exchange using wireless and mobile technologies. WAP application is used In order to get access to the information and services in the context of mobile commerce.

**OBJECTIVE:** The first objective of our study is to review the literature thoroughly in order to identify the various issues related to mobile commerce and WAP applications. The second objective of our study is to propose a suitable solution for the identified issues.

**METHOD:** we have used ordinary literature review as a research methodology for the identification of various issues concern to mobile commerce and WAP applications.

**EXPECTED OUTCOME:** The study has explored various issues related to mobile commerce and WAP applications. During the review we have identified various issues. Some of the issues are security issues, business models issues, heterogeneity issues, usability and small screen issues. Our study mainly concentrates on small screen and usability issue. A propose solution for the small screen and usability is presented. This paper addresses the small screen and usability issues of mobile commerce application. The paper proposes a new approach for designing and developing m-Commerce applications keeping in view the various screen size of different mobile devices. This technique is based on customers' mobile screen size. In order to visualize the Idea University of Malakand WAP portal has been shown on various mobile models using WinWap emulator.

## Keywords

Mobile Commerce, M-Commerce, WAP application, M-Commerce issues and solutions

## 1. INTRODUCTION

Mobile commerce is probable to be the subsequently giant signal of business [1]. Mobile commerce, or m-commerce, has significantly reduced the distances between purchaser and customer. The customer is getting connected to the business world any time anywhere. According to [2] m-commerce is defined as any type of business transaction of an economic

value that is accompanied through a mobile stratagem that uses a wireless telecommunications network for communication. M-Commerce fluctuates partly from e-Commerce (electronic commerce) owing to the special features and restraints the mobile devices and wireless networks have. So e-commerce is considered to be the buying and selling of information, products, and services via computer networks and internet. In current ages, wireless telecommunication and WAP has become a common topic of research papers and studies. The new tendency in technology is to provide users with ability to have all they could possibly need a packed sized device. Smaller and smaller PDAs (personal data assistants), laptop computers and mobile phones are hitting the market, incorporating brand new features designed to let the user work and access documents in whatever station they are in, with this a new buzzword "Mobility" introduced in the business world. Mobility is defined as "Mobility is the ability to access information and services any time anywhere" [3]. M-Commerce can take the consumer and vendor together more easily and facilitate greater incomes and a closer customer relationship. Single proprietor has regulator over data whereas the mobile device can be highly personalized. The astonishing development in the use of cellular phones and wireless enabled mobile phones, is giving growth to yet another insurgency in the business world i.e. Mobile commerce or m-commerce. Due to recent development in wireless technology, the customer is able to access information and services from a packed sized device anywhere any time [4]. There has been a wonderful increase in wireless technology in the last few years. This advancement has change the way people do businesses i.e. people are using wireless technologies for business purposes. Using wireless technologies hand held wireless devices, the clients are now capable to access material, data, information and services any time anywhere. Just similar to conventional trades it is tremendously essential to have profound acquaintance of the clients and have virtuous relationship with clients. Customer relationship management (CRM) means that how customer should be managed by vendor organization. CRM is a commerce strategies that enhance organization's competitive aptitude, it make a winning strategies for understanding the customer's necessities, promoting the rising rate of organization and uphold customer in a high competitive market environment. CRM is needed because it will improve customer expectation, trustworthiness and satisfaction [5]. Mobile client dependence and trust is one of

the significant features for the growth of mobile commerce (m-commerce). Though; it is tough to mature as it involves skills, practices and technology. Furthermore, it is a constant struggle and efforts form early trust creation to continuous trust improvement [6]. Keeping in view the current literature review on CRM it has been cleared that it is tough to catch the attention of a new client then to uphold the relationship with exiting one. Giving appropriate attention and value to client has virtuous impression on client [7]. Prior to undertake the business activity, the customer decides either to go for traditional commerce; e-commerce or m-commerce, each of the business strategy has its own advantages and disadvantages. In advance countries of the world the usage of cellular phones has been melodramatically increased, same is the case with developing countries as well. As a result of this advancement the purchase of mobile products and services also increased. The quick and fast growth of mobile uses has given upswing to a new word: m-commerce. M-commerce is defined as the application of wireless communications [8]. The mobile clients are now able to access information and services 24\*7 anywhere i.e. (access banking financial statement and pay bills, receive store quotes and initiate buy/sell dealings, or receive special promotions) [9].

Although the scholarly study on mobile commerce issues and challenges is slowly developing, there is still a need of experimental research on this current topic. "This paper specially Concentrate on mobile Customer Relation Management services which deal with managing the customer relationship throughout the entire customer life cycle, hence supporting marketing, sales and after sale service activities. The reason of this choice is double" [10]. Keeping in view the future of mobile commerce a variety of issues need to be explored. This study is a part of undertaking this exploration. During this study we have studied a number of articles [11-13].

A number of researches have tried to address to explore various issues related to mobile commerce and WAP applications. In [14] various challenges and issues in the context of mobile commerce are explored to assist practitioners in understanding these challenges and issues. Mobile phones and hand held wireless device having small screen can create hitches for consumers. Keeping in view this fact there is a need for usable front end (interface) which improves the usability level. According to [14] one method of improving a limited display area is translucency. In this study translucency was implemented at 50% alpha, and two menu levels deep. Objective and subjective aspects of usability and acceptance were collected. Within the focus of the inquiry the study yielded interesting findings positively relating transparency to apparent usability and measures of getting of small screen information systems. According to [15] various issues and challenges that are related to mobile commerce are Mobile context, connectivity, small screen size, different display resolution, limited processing capabilities, limited power capabilities, Data entry methods. According to [16] the documentation, organization and inspection of mobile consumer needs in the analysis phase and restrictions of mobile devices and technologies are critical aspects in the context of WAP applications development and mobile commerce. Some of the critical issues in mobile commerce are small screen, small multifunctional key pads, limited computational power, limited memory, limited battery life, nonvolatile capacity, low display resolution, unfriendly user interface, graphical limitations, complicated text input mechanisms, limited security, limited bandwidth, low connection stability [16]. According to [17] some of the issues

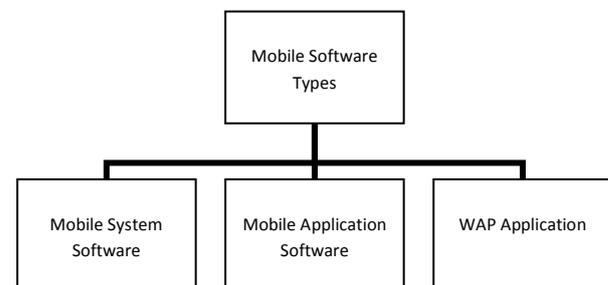
and challenges of mobile commerce are limited input and output capabilities, bandwidth, security, Business models. A study has been conducted by [18] in order to measures usability of mobile phone applications running on two different platforms. Outcomes show that the device on which an application is installed strongly effect consumer satisfaction.

## 2. VARIOUS APPLICATONS OF MOBILE COMMERCE

- Music/Video/Games
- Graphics/Photography
- Short Messaging/Multimedia Messaging
- Unified Messaging/E-mail
- Chat rooms/Video conferencing
- Banking/Business Information
- Shopping/Auctions
- Booking and Reservation
- News/Directory Services/Maps
- Traffic and weather

## 3. TYPES OF MOBILE APPLICATIONS

There are three major types of mobile applications as shown in the following diagram. Our study is mainly related with WAP application development. Keeping in view the different screen size of mobile phones and handheld device, same WAP page may look different in different mobile phones. Some time it is very hard to browse the WAP page on mobile phones having small screen and display.



**Figure 1: Various types of mobile applications**

## 4. SMALL SCREEN AND USABILITY ISSUE

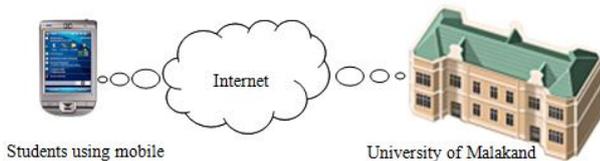
As mobile phones and handheld devices are different from traditional desk top and laptop in several ways like mobile devices have smaller screen sizes and limited input capabilities. If we browse different WAP pages on different mobile models with different screen size it will show different view and some time it is very hard to browse the pages due to small screen and cumbersome amount of information on the WAP page. From the literature review it is also clear that small screen and usability is an issue in the context of mobile commerce. In order to deal with this problem we have develop a WAP portal using PHP and MYSQL, the results of the index WAP page is shown on different mobile models using WinWap simulators in Figure 2.



**Figure 2: University of Malakand WAP application shows different results on different mobile models.**

## 5. SUITABILITY AND NOVELTY

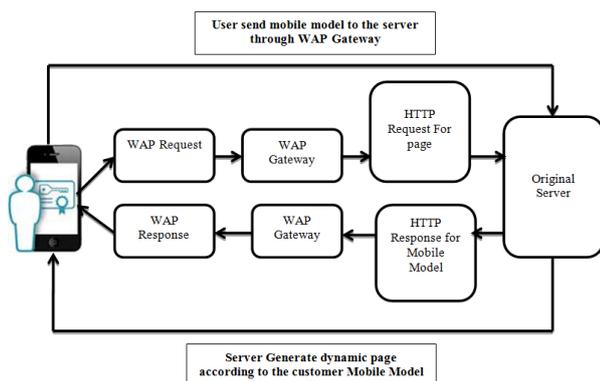
Different studies show that small screen and usability critical in the context of mobile commerce and WAP application [14, 18]. It is also vibrant from figure1. That same WAP page (university of Malakand WAP portal) show different results using different mobile models. In order to cope with the above situation dynamic WAP page generation is proposed, which will generate WAP page according to the mobile model.



**Figure 3: Students are accessing University of Malakand WAP portal using mobile phones**

## 6. PROPOSED SOLUTION FOR SMALL SCREEN AND USABILITY ISSUE

According to the proposed solution the customer will send WAP request, the WAP gateway will process and interpret the WAP request to HTTP request. In response to the request made for a specific WAP page, the server will ask for the model of the mobile phones which the customer using. The customer will send the mobile model and the server will generate the dynamic WAP page according to the customer model and requirements. The proposed solution is shown diagrammatically in Figure 4.



**Figure 4: Graphic representation of propose solution**

## 7. CONCLUSION

In this paper various issues and challenges in mobile commerce and WAP application has been identified from the literature. Some of the important issues are security issues, business models issues, heterogeneity issues, usability and small screen issues. Our study mainly concentrates on small screen and usability issue. A propose solution for the small screen and usability is presented. This paper addresses the

small screen and usability issues of mobile commerce application. The paper proposes a new approach for designing and developing m-Commerce applications keeping in view the various screen size of different mobile devices. In order to visualize the Idea University of Malakand WAP portal has been shown on various mobile models using WinWap emulator. The dynamic WAP page generation mechanism for small screen and usability problem is also presented.

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