

Developing Mobile Commerce Website Design to Enhance Users Experience

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Summary

Mobile Commerce has been described in the past years. Wide use of web enabled wireless devices for example laptops, mobile phones, and PDA's facilitate customers to do their transactions electronically anytime and anywhere. As a result, customers are adjusting mobile commerce frameworks to ease applications with information, entertainment and commerce throughout their mobile devices. This research paper provides an overview of designing mobile web pages. These includes content and navigation, security and privacy concerns and advertising through the web as well as attracting new and web clients. This paper provides guidelines and recommendations for mobile commerce design as a potential step on the way to enhancing user experience and acceptance of mobile commerce

Key words:

Mobile commerce, electronic commerce, Security, Web Design.

1. Introduction

Mobile Commerce (m-commerce) is a developing part of electronic commerce(e-Commerce), where users can act and relate with a service provider through a mobile and wireless networks. M-Commerce applications and services can be followed through diverse mobile networks and wireless. Nevertheless, constraints of both mobile devices and networks shape their operational performance; hence, there is a strong require for dealing into consideration those constraints in the development stages of m-Commerce applications and design them. Another significant factor in designing m-Commerce services is the recognition of mobile users' requirements.

Today's mobile phones provide users many services and applications, not just let them make and receive calls but they let them do much more that. The users of mobile have access to data services such as picture, text messaging, content downloads as well as access to mobile web sites. Most of these data are becoming media channels because they carry both advertising and content. The mobile web has long endured a poor reputation, marked by the over promise of Wireless Application Protocol (WAP), the lack of mobile optimized sites and slow connection speeds and high data charges. However, now days the point of view is much more positive: a rising group of consumers is attracting to use the mobile web every day for practical and

information seeking every day jobs, rather than only for news headlines or football results.

As mobile browsing has exploded over the past years and its uses and applications is right on its heels, is little when it comes to establishing best practices for designing mobile commerce [1, 2]. This paper provides guidelines and recommendation for m-commerce website design. The importance of this research paper comes from offering a mobile commerce design as a potential step on the way to enhancing user experience and acceptance of m-commerce applications and services.

2. Overview

2.1 Designing Web Page for Mobile Devices

Every mobile is different than others; mobile devices have many different types such as PDAs, Smartphone, Blackberry...etc, operating systems, browsers, brands and resolutions: from 120 pixels wide and average desktop 1024x768 pixels wide. In addition, mobile devices have limited screen size including limited amount of information visible initially which requires lots of scrolling. Therefore, we need to take all these characters and features in consideration when we want to design a webpage for m-Commerce [3].

2.2 Mobile Web Design

A stylish web page can present on devices very dissimilar from a conventional PC. Mobile telephones such as PDA have limited screen area compared to a Personal Computer. The user of a mobile can read simply a few lines of text and see small images on the small hand applied display. Web content could be specially designed for particular mobile. However, the object device may change, or resources might not available to modify for several different devices. W3C's accessibility plan was specially developed with the needs of small devices. Therefore, it is possible to use the strategy to design content to fit a general hand held web device. Cascading Style

Sheets(CSS) can be utilized to notice the device used and adapt the page design to fit [4].

2.3 Principles of Mobile Web Design

When we design a mobile website, it should cling to website accessibility design guidelines which set out by W3C. Mobile use WAP technology to browse the Internet. Many WAP browsers strip CSS due to limited screen size and smaller text shown. Most important principles that we should consider them on designing mobile web page are:

- Character encoding is UTF-8
- The site must use CSS for layout
- Coded using either XHTML or XML
- The largest screen size available is probably 640 x 480, while the average is closer to 120 pixels
- Text entry can be quite difficult. Try to use a list of choices, such as radio, buttons or lists
- Images should be gif or jpeg
- provide a 'back' button or link
- The maximum total page size suggested is 20 kilobytes [4].

3. Designing Issues

This section describes some content designing issues and gives some recommendations.

3.1. Screen size

Whilst screen resolution is a subject with regular Web browsing, the actual screen size is important when dealing with mobile devices. Screen size limitation is an issue since the majority of Web sites are designed to view on desktop displays. The page layout resumes that user can sight large portions of a page at once. Because mobile contents services and application are increasing getting variables, mobile content developments need design as well as guideline to satisfy users' needs. The restriction of mobile of screen size and small browser, uncomfortable navigation and limit download.

Mobile phone has different browser sizes depend on type of device. Inconvenience owing to small screens and the growth of digital multimedia broadcasting technologies have led to a continued boost in the size of screens. Nonetheless, the small size of screens still remains an obstruction for further development of mobile web applications and services. While screen resolution is a subject with regular Web browsing, the actual screen size is important when dealing with mobile devices. Screen size limitation is an issue since the majority of Web sites are designed to view on desktop displays. The page layout resumes that user can sight large portions of a page at once.

3.2. Menu (Structure and Positioning)

The menu should be divided into flexible menus and fixed that can differ depending on services provided by every specialized content. To devise the rule for menus, it is essential to define the importance and order of the menus for individual sites by a single, shared standard of importance.

3.3. Font-size

For mobile applications, fonts with better readability must be developed as the browser screens are small; also the types of colors require being limited, because these colors are seen on LCD screen. The font size in mobile services generally between 8 and 10 points should make sure the best readability. Readability can be enhanced by using bold fonts for important information such as title, smaller ones for extra descriptions and larger ones for showing the current status [5,6]. Moreover, the serif font displays the best readability for written English text, except things are quite the conflicting for dot LCD screen. The English serif font can be employed for links, and for such particular cases, it is recommended to utilize the san serif font. Table 1 shows how web page text size are interpreted by mobile phones.

Table1: Web page Vs. mobile page text size.

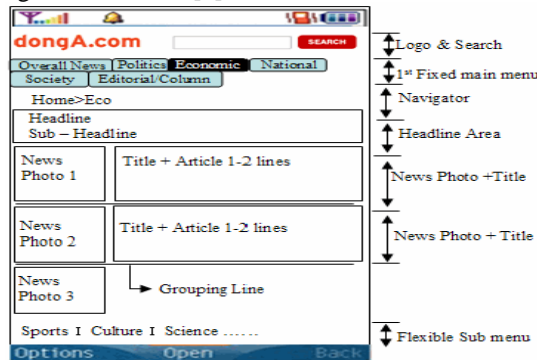
<i>Web Page</i>	<i>Typical Web-enabled Mobile Phone</i>
Font size = 6, 7	Font size = 5
Font size = 4,#5	Font size = 3
Font size = 3	Font size = 2
Font size = 1, 2	Font size = 1
H1	H2
H2	H3
Font family = Verdana, Arial, Times, Courier, Helvetica, Comic Sans, etc	Sans serif
Text appearance: wide kerning, heavy/thick type	Text appearance: tight kerning; fine/thin type

3.4. Navigation

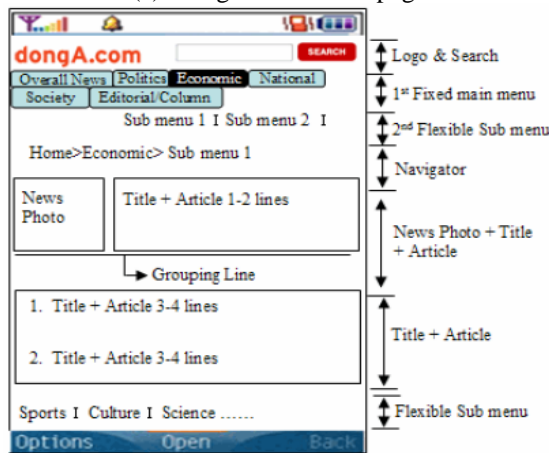
Mobile handheld content is best organized in a simple two-to three-level navigational hierarchy. For instance, 2-level structure may include a main menu of article, and the article itself would show the users access to a content page. A tree-level structure would consist of a set of submenus between the main menu and the other pages.

When designing a webpage for m-commerce, it should be made sure that there are no more than three navigation depths, and a navigator should be provided for users to recognize where they are. In figure 1, the news site screens were designed based on the guideline defined above. In the

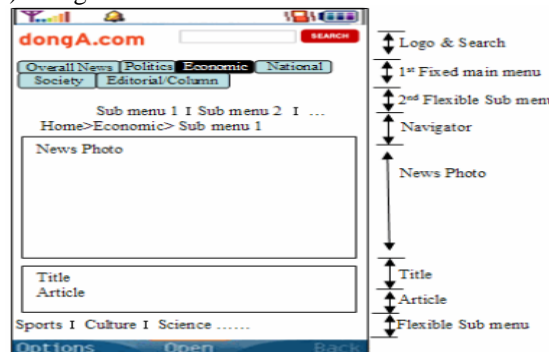
first screen (a), headlines were representing text and designed together with their images in order that users can easily observe they are in the main page. In the second screen (b), displays a page which can be seen when any contents object on the first-depth screen is clicked. This page contains more titles and headline news articles as well as has smaller amount of images. The last screen (c) shows the content of news articles that the users click to read. A navigator should be added to every page to stop users from getting lost in the site [5].



(a) Design of the main page



(b) Design of Sub-Main Screens for Certain Directories



(c) Design of article pages for reading the content of the articles

Fig. 1: Design of screens based on the depth of news site [5]

4. Security

Security is one of the most essential elements in the future development of e-businesses. Ensuring that communications stay secure between the Web server and users is an important issue. A number of Websites, such as Amazon.com and Yahoo! have already wandered out their wireless plans, which give their wireless subscribers the capability to check e-mail, scan the news and shop from mobile devices such as blackberry, (PDAs) and cellular phones. However, these companies are not in their efforts to still on top of the wireless game.

Security is a major concern in m-commerce. It is also a main challenge for a wider adoption of m-commerce[2,7]. The security concern is about making transactions over the Internet and the wireless networks. The Mobile e-Cert is available for businesses and individuals to authenticate the identity of subscribers over almost all kinds of mobile device, including mobile handsets and PDA. It is a dependable and seamless security infrastructure established for wireless digital certificates, and it really enhances the ease of use for consumers and further drives the growth of e-commerce and M commerce.

Payment processing such as credit card is a very important component of m-commerce web site that needs to be very secured through it as well as provided personally identifies the subscribers. Funds from the costumer need to be transferred to the merchant's bank in order to accept credit cards. So, the site owner must apply for a merchant account and be approved. In addition, the web site requires real-time credit card verification using a merchant get away or third party such as Authorize.net.SET. Secure Electronic Transactions is a standard protocol that enables secure credit card transaction on the internet. As result, we must generate the mobile web site and employ identifying personally information as well as pay prices processing in a security designing Mobile Web principles [1,8].

5. Privacy

Privacy issue is an essential feature for designing a web site for m-commerce. Users feel much comfortable entering personal data on mobile devices through the web page [4]. However, the privacy of users and Web activities is at risk. Data collection and Marketing firms are tracking users' online activities via cookies with unique identifiers [8].

Location-oriented applications provide ability to decide users' geographic location. Many m-commerce applications and services use personal preferences to provide value-added services. For example the service provider will not only know user's personal data, but also user's exact geographic location at all the time. In designing a Mobile Webpage, we should consider that layers which provide more trust and privacy.

Security and privacy issues delivered from perceived risk, and these could dishearten the use of m-commerce. From main obstacles of using m-commerce is lack of domination on the information flow, who using it, and target that used to it. If users have more control about how their information recaptured, stored, and shared by the online service providers, this can consolidate their trust likewise give them feeling more control they have. Evaluating security, trust and privacy factors is important in decision making of selecting appropriate m-commerce website [7]. Therefore, Further studies focus on design, security and Content factors that affect the users' trust in mobile commerce websites are needed.

6. Advertising

Mobile phones are getting increasingly sophisticated, with high-resolution screen, sophisticated browsers and high speed access. To give brands and markets and opportunity to leverage the improvements, the MMA, MEMEA Advertising guidelines examine the properties of mobile web advertising banners[9].

Buying advertising on mobile web is similar to buy one on the desktop web. Interactive display advertising is the major advertising unit. Mobiles offer more enhanced form of advertising targeting although mobile web banner advertising impressions can be purchased by cost per click (CPC) or cost per thousand. A publisher and operator who has mobile web site sell mobile advertising directly, while others contract out their inventory to be sold by a third party [9].

Mobile web design style guides and principles have been available for years, and adherence to those principles by site publishers and owners is rising for the benefit of the commerce. the principles include:

- Limiting user inputs to short sequence of text or numeric because the lack of the keyboard on most devices.
- Data volume of a mobile web page is limited, no more than 20kB.
- Setting the number of retrievals such as images to 10 to reduce page loading.

7. Attract new/web clients

There are some aspects that make your mobile web page is very attracting, and then normal readers even new clients will be always your web costumers even if your web sites do not offer much services. In m-commerce web, designer can employ some features and characters, these include site Structure and content, writing style and support navigation [8].

7.1. Site Structure and Content

To make your mobile web page is attracting for readers and new clients the structure of content, should be limited; these can be the following features:

- Structure information is meaningful to the user. However, Different user groups might need different interfaces.
- Interview users to found the users' terminology and how they sort information.
- Produce a card for each expected page for the site, and utilize card sorting techniques to design an appropriate structure.
- Providing some services that help users to have benefit from same web site such as checking email or buying goods online.
- Designing some icons and menus that make users more stimulate for events like display a video or a voice in the same web.

7.2. Writing style

The following features give some insights when we write on a mobile website:

- Make the text scan able and readable with bulleted lists, meaningful headings and short sections of text as well as highlighted keywords.
- Do not contain unnecessary "white space" as this impedes scanning the text.
- Start with the conclusion, and then provide the details.
- Provide one large page for downloading or a file to print.
- Use different colors and sizes for text by employing CSS.
- The most important paragraph in news article is at the top, the following paragraphs continue the story, so using title with different style than the rest of the page make it more readable and scan able.

7.3. Navigation

Help users find their way, tell clients what to expect:

- Using a familiar symbol, such a newspaper front page for the home page of a news site.
- Show readers where they can and where they are.
- Use a reliable page layout.
- Minimize the number of clicks required to reach final content: more clicks more users website lose.
- Because the small size of mobile screen, users can not have a wide area of web appears on their mobile, so they do not like read from webs that have more scrolling bars.
- Use URLs which are meaningful and exclusively lower case.
- Provide link titles they make simpler navigation for clients with recent browsers which support this characteristic and give a site map or overview [4,10].

8. Conclusion

This paper briefly reviews some of the most important technologies, and give some recommendations for designing mobile commerce web site that must be readable on mobile devices. It discusses the most issues that must be considered on designing a web site for m-commerce providers. First, design content and structure that should be suitable for different mobile with different screen sizes. Second, make sure the webs are very secured by web site security principles as well as provide privacy for users to authorize their personal details. In addition, using advertising banners that has been raising revenue of mobile web pages. Finally, how the designer and the publishers make their web pages more attractive for readers as well as new clients.

The online marketing strategy is a key component of any website, which means when designing the mobile website, taking in the mind that there is a great care for serve the target market effectively and efficiency. To achieve that, requires consideration of number of elements such as how easy to navigate, aesthetics, content of the website, accessibility, and personalization feature. All of these combined each to other will influence the experience of users with the website and, finally, their satisfaction and adoption. How to measure the effectiveness of website design from the perspective of the user? There are two factors could serve this target are perceived usefulness and perceived ease of use.

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