Techniques for Developing Mobile-Friendly Web Sites

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INTRODUCTION

This article describes the three most popular techniques for developing mobile-friendly websites. Such sites are designed to accommodate the physical limitations of mobile devices. These limitations include small displays, touch screens, low bandwidth, and high latency. To accommodate these limitations mobile-friendly websites format pages for vertical scrolling, provide larger touch targets such as buttons and links, minimize the amount of data that must be downloaded, may display less information than sites designed for desktops, and utilize space saving navigation techniques. The objectives of this article are to describe the attributes of mobile friendly websites and overview the most popular methods for developing them.

BACKGROUND

The growing use of mobile devices for e-commerce, product research, news, social media, and web search has created a need for mobile-friendly websites. In the early 2000's the majority of web traffic was from desktop devices and most websites were designed to be used with full-size monitors, keyboards, and mice. The introduction of the iPhone 2007 was the beginning of a rapid shift to mobile devices (Ebner, Stickel & Kolbitsch, 2010). By early 2013 users were spending more time online with mobile devices than with desktop devices (Marshall, 2015). Google reported in May 2015 that searches from mobile devices exceeded those from desktop devices in 10 countries, including the US and Japan (Dischler, 2015). By January 2018 mobile internet accounted for 52% of total worldwide web page views (Statista, 2019). With mobile devices accounting for over half of the world's web traffic it is important that websites be mobile friendly.

Researchers have found that the usability of mobile sites has a significant influence on user perceptions, user satisfaction, and trust (Casalo, Flavián & Guinalíu, 2008; Lee, Moon, Kim & Mun, 2015). Mobile usability has also been found to have a strong influence on the buying behavior of consumers (Hsu, Perng, Chiou & Ou, 2014).

PHYSICAL LIMITATIONS OF MOBILE DEVICES

In this article the term mobile device is used to refer to smart phones and tablets. Desktop device refers to desktop computer and laptops. The two types of devices differ primarily by screen size and input methods. Mobile devices typically have smaller screens than desktop computers and cannot display as much information. Web designers can accommodate smaller screens by arranging content in screen-width columns that can be conveniently viewed with vertical scrolling. Mobile-friendly sites frequently display

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less information, smaller images, and use more space efficient navigation. For instance, navigation options that are fully visible on a desktop computer may be put into a "hamburger menu" which the user may then expand to display navigation options (Moyers, 2018).

Mobile devices also use touch screens for user input rather than keyboards and mice. Touch screens require that tap targets, such as hyperlinks, buttons and forms, be large enough that a user can tap it with a finger. They must also have enough space around them so that users can tap individual items without accidently selecting other tap targets (Brooks, 2017).

Figures 1 and 2 compare the same web page (https://huxley.wwu.edu/) in desktop and mobile formats. The desktop format (Figure 1) displays a large image with navigation menus both above and below the image. The five navigation options in the top menu and eight options in the bottom menu are all visible. The page content (not visible) uses both two and three column layouts.

Figure 2 displays the same page formatted in a mobile-friendly layout for an iPhone 8. The screen of this device is only 375px wide verses approximately 1500px for the desktop site. The two navigation menus have been replaced with a hamburger menu in the top right-hand corner. When the hamburger menu is tapped it opens to fill the screen and displays all of the navigation options. The large image is reduced slightly in size and only about 30% if it is displayed on the mobile device. The page content (not visible) is displayed in a single column that is approximately 11 screens tall. On this particular page the mobile layout displays the same content as the desktop layout but it is common to display less content in mobile layouts.

Figure 1. Example of desktop layout