Mobile Web Design and Usability

by

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Abstract:

The purpose of this study is to identify the best practices in designing mobile website layouts. It includes research on the current design trends for the mobile web and discusses the future for mobile website interaction. It includes interviews of industry professionals who give their insight on experiences in designing and developing mobile websites. A user experience survey conducted compares a desktop version of a website to its mobile version counterpart, testing users' preferences for mobile websites in the following areas: navigation, ability to search, and design. The results of this study can be used to improve the mobile web browsing experience through recommendations for mobile web development and design.

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Chapter 1. Introduction

By 2012, it was predicted that more mobile devices would be manufactured than Personal Computers (PCs), and that PC usage would drop by 20%, while mobile device usage picks up the slack. The mobile industry is growing fast, driven by the advances in mobile device technology as better browsers are implemented and screen resolution increases. As the mobile technology advances, the mobile user experience evolves due to the increased usage of smartphones and tablets. Because of the jump in mobile device usage, there is an increase in mobile web activity as more people are accessing the Internet through a mobile device.

This opens up a new market for businesses, as their websites are being accessed everyday by customers on mobile devices rather than from customers using a desktop computer, such as a PC, that provides at least 13" of viewing space. Mobile devices have small screens with only an inch or two of viewing space, revealing the increasing need for businesses to have mobile friendly websites to cater to the growing mobile market. The term "Mobile Friendly" is commonly used to describe websites that have adapted to the small screens of mobile devices. This study asks: What are the current trends for designing and improving usability on a mobile device, and to what extent are businesses successfully creating a mobile friendly companion website, to cater to mobile user needs?

Websites viewed on a smart phone need to include certain aspects to ensure the best functionality. Most importantly the audience has to be kept in mind, for they will be viewing the site when a desktop computer is not available. The user will be viewing the site on the go, so the information needs to be presented in a clear and legible way. Type should be readable and set in an appropriate size to be effortlessly read from the a few square inches of space. Only essential information should be available on the first page with a simple navigation so the user can be easily directed with no difficulty. The user also needs their information immediately so pages must be optimized so they load quickly. Images should be in the appropriate resolution and size in order to provide a positive user experience for the mobile viewer.

The physical aspects of the mobile device need to be considered as well. The two most used smart phones to date are the iPhone and the Android phones which both have a touch screen. Touch screens change the browsing experience completely because your finger becomes the mouse, and hovering options are not available. It becomes extremely important to know how to change a design so the user can easily 'tap' instead of 'click'. Also, many phones such as the iPhone and Android phones have the capability to switch to a landscape viewing, adding completely new dimensions for the design. Every mobile device is different in size and shape making it essential for a design to be able to resize accordingly.

Mobile devices are an increasingly important way to access the Internet. Many businesses are discovering that mobile web is vital to their business and websites designed on a desktop computer do not transfer well to a small screen. Companies are adopting strategies to make mobile companion sites and some are proving to be more successful than others. Businesses should consider choosing a mobile web solution for their content because the mobile audience is growing rapidly, potentially taking over desktop computers.

The purpose of this study is to improve mobile browsing experience and to learn the steps to optimize design for small handheld devices. Mobile web has proven to be a necessity and is a growing market for the Internet today. Discovering how people browse on their mobile device will help provide insight for designing a visibly pleasing page, while also catering to the needs of the user. A detailed analysis on how businesses are able to create a mobile friendly website and a comparison of a desktop version and a mobile version, will help determine the best practices for designing for mobile web.

Chapter 2. Review of Literature

Over 63 million people in United States accessed the Internet through a mobile device in the year 2010. By 2013, it is predicted that there will be over 1.7 billion using the Mobile web worldwide (Chapman). According to Morgan Stanley, by 2020, desktop Internet will be over taken by mobile Internet as "more people will use their mobile devices to access the Internet than their desktop or laptop computers." JiWire's public Wi-FI study has found that 56 percent of connections are from mobile devices such as Android smart phones and the iPhone (Axon). The mobile Internet has proven to be a main player in Internet usage today, but some design factors are holding back successes and effect the future of mobile web design.

It was not until 2000 that the wireless world really started to take off with the launch of Internet on mobile phones and it was not received well by the public. At the time only a few mobile phones had built-in Web browsers which were expensive, and it was nearly impossible to find websites that worked on mobile phones (Camp). According to Graham Camp, "customers didn't like it, content companies didn't like it, and wireless carriers didn't like it. It was a good recipe for a failure, as we all know now." The idea was well known and frequently talked about, but not in the best regard. Many doubts and skepticism held back the development of the mobile web. Most innovative technologies take time to prosper, which is why desktop web design must be addressed before moving into mobile web design.

In 2000, desktop Internet was still in its beginning stages and at this point users were predominantly using dialup Internet. Browsers were primarily text-based with no graphics or any thought of design (Sauter). First impressions count especially in the way the Internet is used today, where people browse quickly and "form opinions about the look of your website in 1/20th of a second" (Bradley). In result of this, the design of a website is an important factor in the success of an organization.

Steven Bradley, a Web Designer and Developer, feels that the best web designs are ones that are simple and "great web designs keep out of your way and don't draw attention to the design itself.

Some of the best designs are those you'll never notice because the design has allowed you to move right into the process of interacting with the site, finding what you want as quickly as possible and moving on to the rest of your life" (Bradley). Although Bradley's statement is describing desktop web design, it has direct correlations to designing for mobile devices but to a greater extent. Mobile devices are meant to be used on the go and when a computer is not available. So Bradley's statement about finding information quickly needs to be emphasized and brought to the next level when designing for a mobile device.

Today, accessing websites via phones and mobile devices are dominating the way users browse the Internet. Because of this, designers have the growing need to become educated in mobile design to accommodate this booming audience. The most important concept that all designs will depend on is functionality.[1] It cannot be stressed enough how important functionality plays into design. The designer must know their product before they can even attempt to start the creative process (Camp).

Steven Snell from *Smashing Magazine* knows how to strategically deal with the unique situations and challenges that play in the mobile layout. Key aspects that will improve functionality are simplicity, white space, lack of images, and prioritized content. Simple options for a scaled-down screens are essential, especially when Internet connections are often slower, stressing the importance of users accessing the most crucial parts (Axon). The simplicity is received as refreshing in the "age of crowded a pages." Cameron Chapman a designer for Noupe website, agrees that "your mobile site, in most cases, should be simpler than your standard site" and that this might mean "redoing your menus, eliminating images, breaking up text over multiple pages, or otherwise re-working your site's layout and functionality." White space also plays into the simplicity aspect. Snell believes it is an important part of any design but to actually implement it into a mobile web design proves to be a challenge as the typical screen size is so much smaller. All web designers have to work with varying screen sizes, but mobile screen sizes are more of challenge then desktop screens. Screen sizes are always changing with the trends, while older sizes are still in use. The most commonly used resolution is 960x640 pixels for the iPhone 4, and they are improving each year with sharper

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[1] *see Appendix A*

resolution and larger screens.

Images can "often do more harm than good." High-speed connections are common for home computing in the recent years, but mobile devices still lag with excessive image use that hinder the users ability to access information fast. Because of this it is "very common to see minimal use of images in mobile Web design." Logos and icons are fine as long as it does not interfere with optimization or loading time. Last of all, "simplicity of these pages and the general lack of many options, the content displayed is highly prioritized." All websites need to be user-focused resulting in the fact that many mobile websites are ad-free, even though advertisements have become widely accepted on the Internet. Many websites have a search bar or a store locator field as the first thing that comes up on a page, knowing that the user is probably trying to search for something specific or trying to find a location while on the go. Functionality, for Chapman, includes limiting scrolling to one direction. He feels that it is really annoying to have to scroll in multiple directions especially on a touchscreen mobile device, as it is easy to accidentally scroll in the wrong way. Another annoyance that should be avoided is pop-ups or links that open new windows. They interrupt the browsing experience so only use them when imperative, and if used, make sure to alert mobile visitors before.

Once designers know all the aspects to keep in mind while designing for mobile devices, then they can expand and start bending the rules. More beautifully designed mobile sites are coming out daily, but there are still some sites that have not made the step to make a mobile form from their standard sites.

Understanding how users interact both physically and visually with a mobile device has helped with the design aspects of browsing, but another factor equally important are the popular browsers used. Opera, a popular web browser, collects data every month in their State of the Mobile Web report with a list of the top ten visited sites on a mobile device in various countries. As of January 2011 in the United States, a few of the top ten are as following: google.com, facebook.com, wikipedia. org, twitter.com, yahoo.com, and accuweather.com. A majority of theses sites are search engines

and social media sites. People like to stay connected with friends and family and the easiest way is through their phone. Search engines are on the top of the commonly accessed sites for obvious reasons: finding answers to everyday questions.

Other important markets working their way to the top ten are shopping pages. According to Adobe's Mobile Shopper Insights for 2011, 73 percent of users shop online for an hour, on average, a week. It is becoming common for shoppers to research a product at the point of decision "transforming the way consumers shop and interact with brands, and retailers that are not investing in this channel may risk getting left behind" (Adobe). One main insight that Adobe focused on is how users are more likely to type in their search directly into the search bar rather than downloading applications. This helps tremendously with how to design a mobile website that accommodates for the preferences of the user. It also helps predict where the future of mobile device usage will lead.

Mobile devices are proving to have a major role in how users access the Internet today. They are predicted to dominate as the primary device used to browse the Internet over desktop computers. Not only are they changing the way users access information, but how websites are designed. Mobile devices are offering more opportunities for businesses to reach their target markets, through new mediums such as mobile web. It is important for businesses to utilize mobile web design to expand markets and improve business success. However, understanding how to conceptualize mobile web design, and how users experience browsing websites from a mobile phone, is key for businesses to successfully utilize the benefits that a mobile device offers.

Chapter 3. Methodology

To determine how to improve mobile browsing usability and to what extent are businesses successfully creating a mobile friendly companion website, this study employed interviews, surveys, and Content Analysis. Deciding how to design in the mobile web field is a very subjective task. Because of this, the research process will not be the same as researching a scientific study. Different methods of research can be used to find solutions for creating a functional mobile web page that is aesthetically pleasing. One method in determining what processes work for mobile web is to ask industry professionals in Elite and Specialized interviews. Asking experts in the web design industry who have seen the transition to mobile web and know the increasing importance of this field of design will bring great insight on how it is done. By analyzing what experts are saying about mobile web, and determining what factors are the most important, will lead to surveying a variety of people for their opinions in mobile web usage for Descriptive Research. The last method is Content Analysis, turning data into predictions, which will aid in determining answers for this subjective topic. Using Content Analysis will bring together all surveys, interviews, and Descriptive Research into a solid, quantitative data that will support a solution for designing functional mobile websites, complementing their desktop counterparts, leading to the increase in business. (Levenson)

Talking to experts in the mobile design business is a valuable way to determine which aspects of design produce a successful website. The professional opinions and experience of industry experts will improve this study and improve the previously collected research. Elite and Specialized interviews differ from questionnaires and standard interviewing techniques. They require asking precise, open-ended questions that are open to refinement as the research and interview plays out. When coming into an interview, extensive knowledge on the topic must be done, so as to be able to talk conversationally and let the conversation flow to get as much information as possible. It should seem more like a conversation than a formal interview. According to Lewis A. Dexter, the creator of the Elite and Specialized interviewing technique, there are six steps to follow which are: Open the interview with a general question, avoid leading questions, avoid "why" questions, avoid "either/or" and "yes/no" questions, accept the interviewee's definition of the situation, and give the interviewee

the sense that their input is important to the study. (Levenson). Talking to professionals, specifically

from Fertile Minds and LEVEL studios, two web design firms that work with smartphone

development is essential for a complete research. The interviews will be conducted based off

conversation, as that is how Dexter defines the method of using Elite and Specialized interviews. The

open general questions that will start the interview will be: What are the first steps in the process of

designing and creating a layout for a small screen size? How do you decide what goes on the mobile

version? What do you suggest to the client are the most important aspects that should be presented

on a mobile friendly site? How has mobile web impacted your business in the last few years with the

increase in mobile device popularity?

Another type of research that is essential for gathering information about the trends of mobile

design is Descriptive Research. Questionnaires and surveys complete what cannot be gathered from

interviewing experts. A sample survey of tangibles is a type of survey that takes ideas and opinions

from a sample group of individuals that reflects the views of the population as a whole. (Levenson).

A study will take a group of individuals and allow them browse mobile friendly websites on a mobile

device and compare the experience with browsing on a desktop.

For the study, a group of 26 Graphic Communication students have been tested on browsing

websites on a desktop computer and a mobile device. These students are from a senior level class,

with different levels of experience in browsing on mobile devices. In a controlled lab, they were

told to browse two specified sites, one mobile friendly one not. They were first told to browse the

two websites, *webdesigndepot.com* and *thedieline.com*, on a iMac 27 inch desktop screen and answer

a few questions based on their experience. Then they browsed the same two websites, on either

an iPhone or an Android mobile device and answered a few questions based on their experience.

After experiencing both modes of browsing, the students were able to share their opinions on how

well they felt the desktop version of the website was translated into the mobile version. The survey

questions asked from the desktop version for both websites are as follows:

DESKTOP

1) How many levels of navigation did you find on the main (home) page?

2) Do you find the site easy to navigate?

(Rate on a scale of 1-5. 5 being the easiest)

    1 2 3 4 5

Comments:

3) Do you find it easy to search for content on the website?

(Rate on a scale of 1-5. 5 being the easiest)

    1 2 3 4 5

Comments:

4) Do you find the content (headings, captions, body text) easy to read?

(Rate on a scale of 1-5)

    1 2 3 4 5

Comments:

The survey questions asked from the mobile version for both websites are as follows:

MOBILE (*please stay in portrait mode for questions 1-4*)

 __ iPhone   __ Android

1) How many levels of navigation did you find on the main (home) page?

2) Do you find the site easy to navigate?

(Rate on a scale of 1-5. 5 being the easiest)

    1 2 3 4 5

Comments:

3) Do you find it easy to search for content on the website?

(Rate on a scale of 1-5. 5 being the easiest)

  1 2 3 4 5

Comments:

4) Do you find the content (headings, captions, body text) easy to read?

(Rate on a scale of 1-5)

1   2   3   4   5

Comments:

5) **Switch to landscape mode.** Do the elements scale to fit the screen? Circle one. Yes   No

6) Are there any elements that you saw on the desktop version that you wish were incorporated into the mobile version? (ex. Option to post comments)

Comments:

7) On a scale of 1-5 (5 being the best) how did this site's mobile version compare to the desktop version in relation to design and functionality?

Comments:

Additional Comments:

After all of the research is gathered, a Content Analysis will be completed on the gathered research. Content Analysis is the process of reviewing information and organizing it in a clear way to show the connections and create an understanding of the content. Content Analysis takes opinions, and thoughts, gathered from the research, and presents them in a numerical way. A rating scale was used to show the preferences collected in the surveys making it easy to present information in a numerical way. A majority of the research collected from the Elite and Specialized Interviews is qualitative and not quantitative so Content Analysis is essential in making the data understandable by stripping away unfamiliar technical terms or jargon so anyone can understand. The findings from the study are generalized and described in the results section along with the answers to the interview questions from Fertile Minds and LEVEL Studios. With all the data collected, it will give a further understanding of the process of creating and converting a desktop website to a mobile website.

Chapter 4. Development of Study

This study found answers to questions about designing mobile websites, mobile browsing usability and what aspects of desktop websites transfer well to a mobile version. This section of the study presents the results in two parts: Elite and Specialized Interviews, and a survey. Elite and Specialized Interviews were carried out with industry professionals who have useful information in regards to mobile web development. The survey shows the opinions of mobile users, which are helpful in determining what aspects of mobile web are preferred, and how well desktop versions of a website are transferable to a mobile version.

Interviews

To further understand user preferences when using a mobile device to browse the Internet, an insight in the process and decisions made to create a mobile version of a website is imperative. To receive this viewpoint, this study interviewed Dusty Davis. Davis is a graphic designer and founder of Fertile Minds Media, a web design and development company. Because Fertile Minds Media is a small company, his job requires him to work in all aspects of the web design industry, such as working with clients, designing, coding, and marketing. He is a part of every aspect of their web design, projects, and therefore a perfect candidate to further understand how mobile has made an impact on the user experience.

When working with a new client, the first step is to analyze the demographic. If the demographic is in 50 plus range, then the budget will not be spent on creating a mobile version of the website. It also depends on what type of site you are dealing with. One of Fertile Minds Media's clients is promoting an event for a marathon, where it becomes imperative for customers to have access to last minute information from their mobile devices. On the full site, all the work and design that has been perfected, goes out the window, and you are left with just a small window containing only vital information. In this instance, customers would use the mobile version to look up locations and maps for the marathon. Davis states that a mobile version is not just a scaled down version of a website, but rather a companion site, that takes advantage of the limited screen real estate, that is redesigned

to cater to customer's mobile needs.

Normally a website is approached with the intention of having a mobile version from the start. It is not often that you go back on an existing design and create a mobile version. As Fertile Minds Media begins building a site, a desktop version and a simple mobile version are made simultaneously. When working on a mobile version, narrowing it down to the absolute most important message is key. The main information is typically displayed as the first thing the user sees, with the navigation at the bottom of the mobile version, rather than the top like the desktop version. There is not a set layout for a mobile version, and it may not mimic the desktop version in terms of layout. When it comes down to what goes on a mobile website, the client ultimately makes the decision. Some clients are really sophisticated and come to web designers just for technical assistance, while others are completely dependent on the web designer to take control of the project and lead the client in the right direction.

With a small firm, such as Fertile Minds Media, there are no formal testing methods or analysis done on a finished mobile website to check user experience. Instinct and knowledge of the workspace from experience, becomes imperative to testing what will work on a mobile device.

Data connections are improving constantly, but load times may cause frustration, especially on mobile devices. To improve loading times on a mobile website you should limit everything and minimize files as much as possible, by getting rid of blank spaces in HTML coding. Flash should be left out completely, but javascript still translates well on a mobile device, as long as it is not a complicated file. Mobile devices have browsers that are fully capable of handling the desktop version of a website, especially some of the Android phones that have a typically larger screen then an iPhone. Some companies go straight to the full site for mobile device if it detects a large screen size.

There is an increase in demand for mobile companion sites that will increase in the next few years. The growing concern around mobile web design proves that it is becoming a requirement as

opposed to an option when it comes to web design. All clients now expect to have a mobile version made to complement the desktop version, and pixel-perfect layouts for mobile versions are made simultaneously with desktop versions. Versions for tablet sizes are also in demand. Data connectivity is improving and hopefully will help loading times for mobile devices.

This study also interviewed Rob Patti, a technology manager at LEVEL Studios. He focuses on the development aspects of building websites and understands the technological side. LEVEL Studios works with clients such as Apple and RIMM, where they have a design team and a marketing team. Patti works directly in the development side of web design and has insight and experience in the process of building a website.

When approached with a project, it is clear what the client will want in terms of mobile. Most clients want a mobile version designed to accompany the desktop version. There are some cases when the client as an existing site and they want to optimize a website for mobile. Clients usually have a plan in mind for what information they would like on the mobile version. A solution is generally recommended to the client, which includes removing aspects that are not necessary from a mobile standpoint. Sidebar content with related articles are elements that are not usually transferred over to the mobile version, but may be kept on smaller versions such as a tablet size.

Due to cost involved very few studies or focus groups have been done to test user experience from a mobile perspective. Mobile web is still relatively new and is constantly growing, making it more difficult to test in the same respect as a desktop. At LEVEL Studios, there is a user experience group, which follows best practice, but typically they just get in the mind set of a mobile user, and relate the experience to how they would browse or use their mobile device. LEVEL also focuses on understanding what the target market for each project or client would prefer.

LEVEL Studios develops mobile versions with different processes. One way is to create a sub-domain, such as m.thedieline.com, that automatically redirects the user according to the screen size

of the device that is accessing the web content. The trend now is to use HTML5, which does not redirect the user to a sub-domain, but rather just has the content resize to fit the size of your screen, no matter the device that is accessing the information. It is best to avoid using device detecting content, but rather use HTML5 which provides seamless transitions from one screen size to the next. Flash is avoided, but javascript works well. Mobile devices support the vast majority of javascript and CSS, but some elements do not transfer well. Resolution has not been an issue, except in exporting images for higher resolution devices.

It is important to take into account other screen sizes, which has proven to be one of the main sources of frustration for Patti, when asked about his browsing experience on a mobile device. It is easy to design on a computer that has a 24" monitor, but size considerations are a problem. The most common issues in mobile browsing are small fonts, inconsistent colors, and overall bad design. It is important to fully optimize a mobile version of a website, and if not, according to Patti, it is better to leave a website as is, because users are already used to zooming in and exploring a full-sized site.

HTML5 is going to push the envelope for mobile web. Creating a separate mobile website, such as using a sub-domain site, will become obsolete and not worth the time and money. Having to support two sources of content, or two sources of code bases is impractical. You will want to build a site that is optimized to support mobile devices. Mobile should be considered with every new project. Even if a client does not specifically ask for a mobile version, the web developer can at least educate their client and propose solutions.

Survey

For this study, a survey was given after comparing the desktop version of a website and a mobile version. The survey helped determine how users experience and interact with the content displayed in the two very different ways. This survey was meant to get a better understanding of how websites translate to a mobile device.

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[1] *see Appendix B*

The testers were asked to view two websites on a desktop and then view the same two websites again, but on a mobile device (iPhone or Android). The purpose was to see the content of the website in both versions was perceived by the user. The results of this user experience survey revealed the strengths and weaknesses of both websites and showed how well each website compared directly to its companion site. The first website tested was *webdesignerdepot.com*, which has a very prominent design, and many levels of navigation.[1] The mobile version had a lot of the design stripped out but still had a great look. The second website tested was *thedieline.com* which has a beautiful and simple design, but the mobile version proved to be lacking in optimization.

The first category testers were asked to compare was the levels of navigation and to rank the ease of use on a scale of 1-5 (1=Very hard to use, 2=Somewhat hard to use, 3=Neither hard nor easy to use, 4=Easy to use, 5=Very easy to use). Desktop versions typically have a least three levels of navigation and often there are additional sidebars and related information. *Webdesignerdepot.com* particularity has a design heavy desktop version, but was able to narrow down its navigation to only three levels on the mobile version. On average the navigation for the desktop version, tested as 3.24, meaning that the users felt that the navigation was neither hard nor easy to use.[1] The mobile version tested as 4.44, ranking it as easy to use. *Thedieline.com* had three essential levels of navigation, but on the mobile version only one level of navigation was available for the user. The desktop version tested navigation as 4.36, ranking it as easy to use, while the mobile version was tested as 2.6, low on the ranking scale at somewhat hard to use.

The second category testers were asked to rank was the searchability of content on the website. *Webdesignerdepot.com* has an easy to see search bar right at the top of the page and tested as 4.0 for the desktop version. The mobile version also has a search bar at the top of the page, so it was not surprising when the users tested it as 4.44, easy to use. According to comments on this category, it was clear that the users liked having the search bar in a prominent position in both versions, improving the browsing experience.[2] For *thedieline.com*, the desktop tested as 3.6, neither hard nor easy to use, even though the search bar is located at the bottom of the page. The mobile version

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[1] *see Appendix C*
[2] *see Appendix D*

proved to be much harder to use as it tested as 1.92. The users commented on how hard it was to search because there was no search bar on the main page at all.

The testers were also asked to rank the readability of the content, such as headings, captions, and body text. Having the content presented in a clear and easy to read fashion is very important to retaining a users attention. *Webdesignerdepot.com* tested on average as 4.28, easy to use. The developers of *webdesignerdepot.com* did a nice job at presenting the articles with big headers and having body text with wide margins. The mobile version tested as 4.64, somewhat easy to use. *Thedieline.com* tested as 4.84, on the high end of easy to use, while the mobile version tested as 4.44, also easy to use. The testers commented that the lack of margins made the body text more difficult to read.

The testers were also asked to switch to landscape mode on the mobile device to rank how the website rescaled to fit the different dimensions. Both websites did scale to fit landscape mode, but *thedieline.com* only had the body text rescale. The images stayed the same size and did not reposition. It was expressed in the comments that the testers would have preferred a better layout for the landscape mode, as it is a popular way to view a website on a mobile device.

The most important question at the end of the study was to ask the testers how well the mobile version compared to the desktop version in relation to design and functionality. Overall, the users thought that the mobile version of *webdesignerdepot.com* was great and it was even expressed, in most cases, that the mobile version was even better than the desktop version, which is why it tested as 4.56, easy to use. The users felt that the mobile version incorporated all the important aspects from the desktop version and no aspects were clearly missed that were only on the desktop version. *Thedieline.com* did not fair well as the website's average ranking tested as 2.56, somewhat hard to use. The users were disappointed in the mobile version, which they felt was lacking in design and functionality.

Overall, the interview results provided insight on how to incorporate mobile web to accompany desktop websites. It is important to address the designs of a mobile version of a website early in the web development process. Mobile versions are not just scaled down versions of a website, but rather a companion site to accompany a desktop website. Also, the study on mobile web usability provided insights for improving mobile web design, and revealed which design trends proved to be successful.

Chapter 5. Conclusion

This study set out to determine how to improve the mobile browsing experience and to learn the steps to optimize design for small handheld devices. The result is a clear plan of the process of designing a mobile companion site to work along side its desktop counterpart, and the best practices to allow the greatest browsing experience for users. This conclusion was drawn by analyzing the results from interviews with experts and through a study that compared the browsing experience on a mobile device versus a desktop version.

The importance of catering to mobile users has proven to be a high priority for web developers. Developers are no longer just designing a desktop website, but they are now involved in developing different versions to accommodate for the variety of screen sizes. Internet browsing from a mobile device is common, increasing the demand for mobile website compatibility. From this study it was determined that the most common practice of developing a mobile website is to design a companion site at the beginning of the web development process. Mobile design had originally been incorporated as an afterthought to the desktop versions, but with the popularity of smart phones, it has become a vital piece that should be taken into consideration from the beginning. Fertile Minds Media and LEVEL Studios both stressed the importance of this concept of developing all layout designs for all sizes from the beginning. This will increase consistency and ensure the transferability of each aspect across all platforms.

As all forms of a website are being developed simultaneously, it becomes clear which elements should be incorporated to optimize a mobile version. Simplicity is clear, especially on a mobile device when loading times are slow and visibility is not guaranteed in every situation. Mobile users take more time browsing and do not click as freely as on desktop versions, where speed and connectivity are more consistent. Simplicity and basic layouts are key as was proven in the results from the study, especially in relation to the website's navigation.

Two levels of navigation for a mobile device, was the preferred method, according to the testers.

The mobile version of *webdesignerdepot.com* had only two levels and ranked as very easy to use, while *thedieline.com* had one level and ranked as hard to use. The testers commented on how *webdesignerdepot.com* had the perfect number of navigation levels; one at the top, and one at the bottom where it is easy to redirect once scrolling to the bottom of the page. This seems to be the best practice according to the study to improve usability. In addition to navigation, the ability to search content on a web page was also tested in the study. On a mobile device, where it is imperative to get information quick, a search bar should be present. The testers preferred the search bar to be located at the top of the page rather than the bottom, where it is more likely to be missed. Readability proved to be adequate for both websites in both versions. It is concluded that margins should be included around all bodies of text and images to improve appearance.

According to the comments from the study, many testers expressed frustrations with loading times. Experts from the interviews revealed that these issues could be improved easily in the HTML markup. Web developers should keep files organized and not have any extra lines of code that are not being used, which are the most common reasons for slow loading times. Concise coding techniques are key to improving the browsing experience.

All the aspects discussed in this study should improve the mobile web browsing experience. The results provided clear answers to how users experience mobile websites when comparing them to a desktop version. All mobile websites should have minimal levels of navigation, and include search bars to improve users browsing experience. Simplicity is key for mobile layouts. Busy designs distract the users from the content of the website. Businesses incorporating mobile versions for websites should follow these simple tips to ensure mobile website success and improve browsing for their customers.

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Appendix A

Example of a good designed website and its mobile companion site:

DESKTOP   *www.bankofamerica.com*
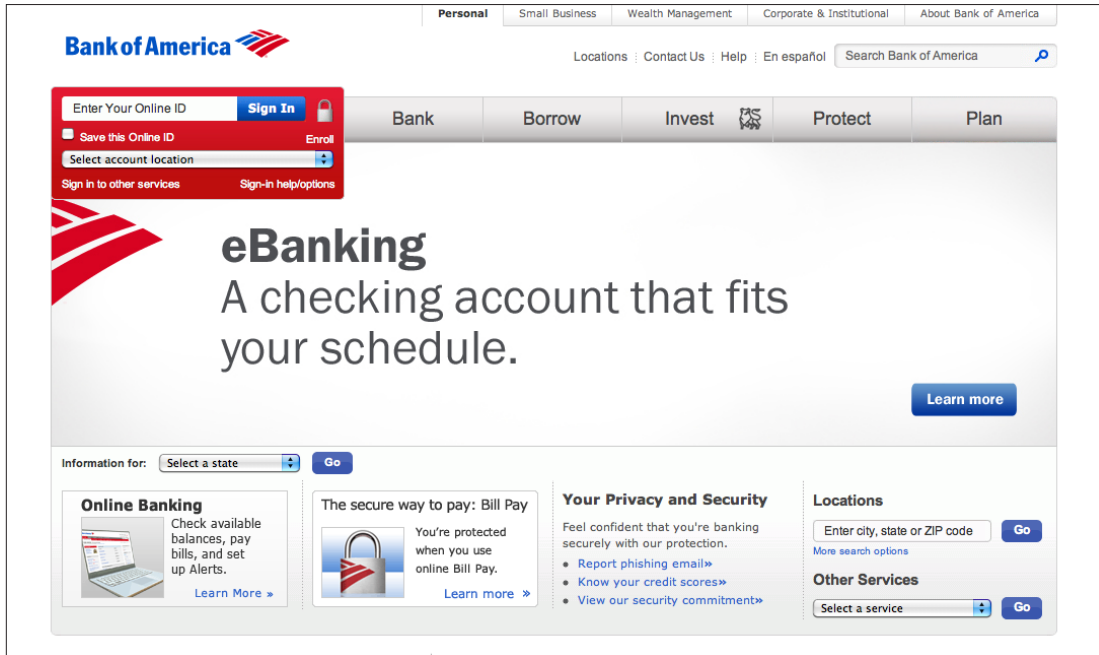
MOBILE
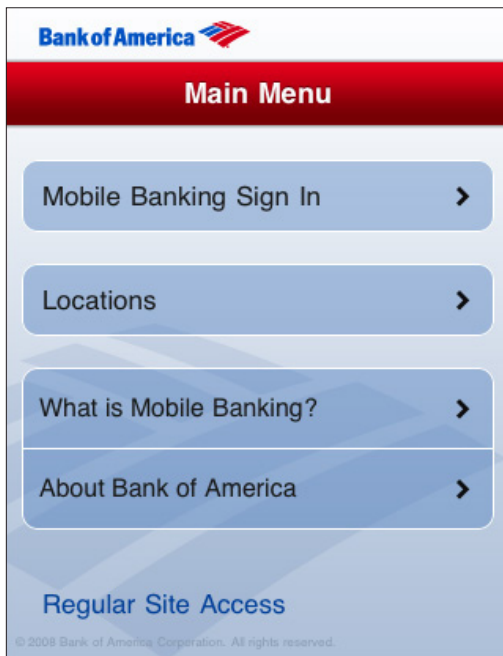
Appendix B

Desktop and mobile versions of the websites used in study:

Webdesignerdepot.com
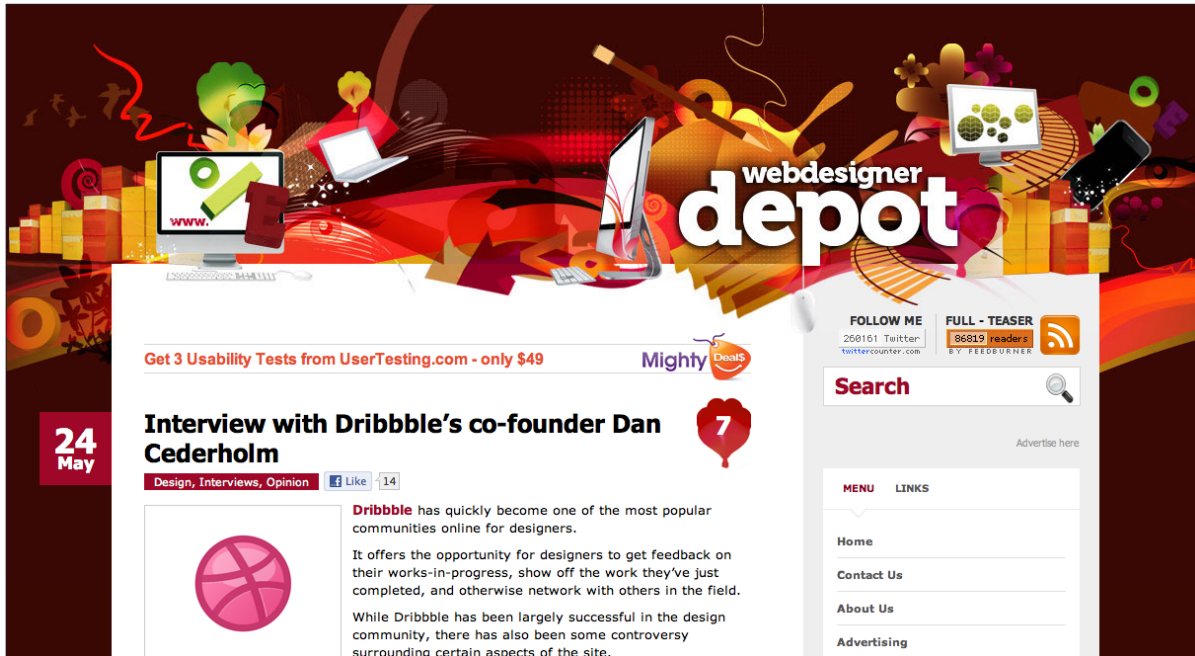
DESKTOP

MOBILE
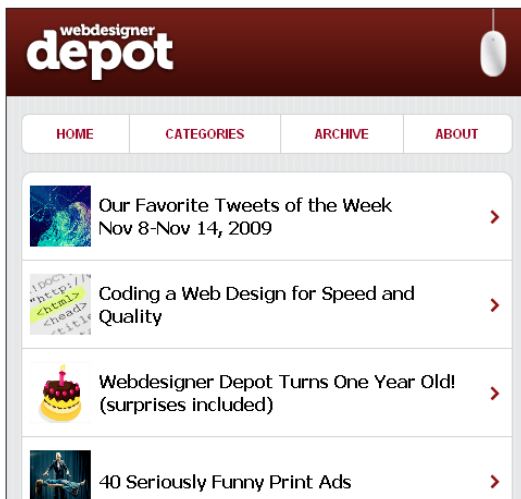
Appendix B *(continued)*
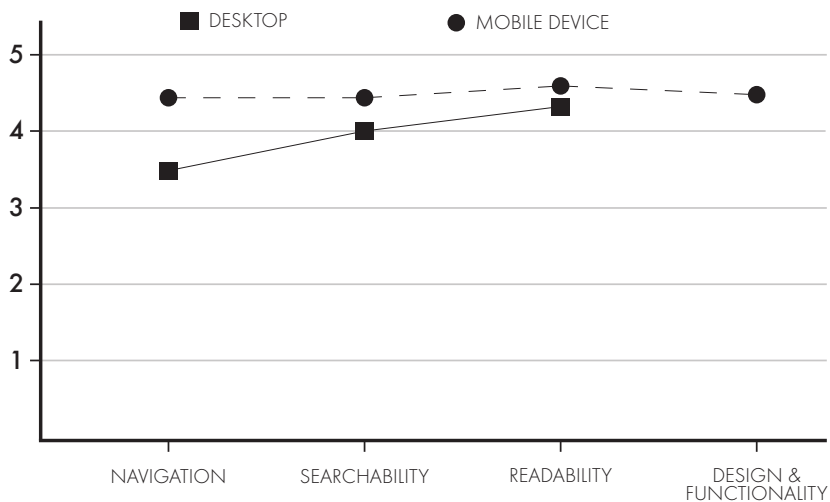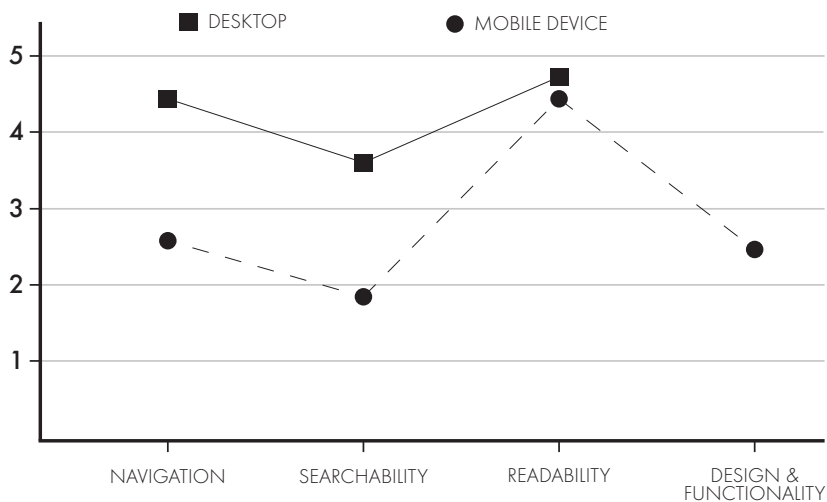
Thedieline.com

DESKTOP

MOBILE

Appendix C

Graphs of study results:

Webdesignerdepot.com

Thedieline.com

Appendix D

Written comments from study:

Webdesignerdepot.com
DESKTOP

1) Do you find the site easy to navigate?

"Too many web banner ads on right sidebar...then the navigation is easy to read"
"Navigation is far away from the top and gets lost"
"Navigation not visible; have to scroll to find navigation"

2) Do you find it easy to search for content on the website?

"Big search box"
"Prominent search bar"

3) Do you find the content (headings, captions, body text) easy to read?

"Nice contrast"
"Too busy!"
"Easy to distinguish between headings, body text but still not easy on the eyes"

MOBILE

1) Do you find the site easy to navigate?

"So much easier to find and see navigation compared to desktop"
"I love the categories at the top and it is easy to see multiple stories at once"

2) Do you find it easy to search for content on the website?

"This site is in good order & also has a search bar"

3) Do you find the content (headings, captions, body text) easy to read?

"Clean and simple"
"Good contrast and clean typeface"

4) How did this site's mobile version compare to the desktop version in relation to design and functionality?

"The mobile website is almost easier to deal with because it's not over crowded with other elements"
"I like the mobile version better"

Appendix D *(continued)*

Thedieline.com
DESKTOP

1) Do you find the site easy to navigate?

"A lot going on but can easily get through"
"It was a little cluttered-my eye didn't know where to land"

2) Do you find it easy to search for content on the website?
"They have a search bar and also have good categories within navigation"
"Directory page is great, no search tool though"

3) Do you find the content (headings, captions, body text) easy to read?

"Lots of contrast, simple font"
"All the fonts are really clean"

MOBILE

1) Do you find the site easy to navigate?

"You just scroll down- nothing to really navigate"
"Navigation at bottom of page; have to scroll through multiple articles before reaching it"

2) Do you find it easy to search for content on the website?

"No search bar!"

3) Do you find the content (headings, captions, body text) easy to read?

"Not as beautiful as the desktop version"
"Readable, but lack of side margins is weird"

4) How did this site's mobile version compare to the desktop version in relation to design and functionality?

"Lots of issues with repeating divs which means I missed out on a lot of content"
"Mobile version is definitely limited"