

Handheld Usability: Design, Prototyping, & Usability Testing for Mobile Phones

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ABSTRACT

This tutorial teaches UI design, prototyping, and usability strategies for mobile phones. Hardware UI, operating environments, and wireless networking will be presented. Information architecture, paper prototyping, and usability testing of phones will be taught with team exercises. SMS/MMS, WAP, FlashLite, SVGt 1.2, and Java will be overviewed.

Categories and Subject Descriptors

H.5.2 [User Interfaces]: User-centered design

General Terms

Design, Human Factors

Keywords

Mobile, Usability, Handheld, Phone, WAP, SMS, MMS, UI

1. INTRODUCTION

Handheld Usability by Scott Weiss, published in 2002 by John Wiley & Sons [1], taught a background of the mobile UI landscape, and continued with design, prototyping, and usability testing for phones and other programmable consumer electronics. Weiss has taught an eponymous tutorial on and off since 2001, and this iteration has been fully revamped to be appropriate to 2007's devices and user interface technologies.

2. LEARNING OBJECTIVES

The goal is to present challenges and strategies for designing user interfaces for handheld devices. A brief introduction to types of handheld devices and operating environments will set the stage for a more in-depth discussion and hands-on learning activities centered on design & information architecture, paper prototyping, and user testing. Exercises will focus on applying the skills and strategies learned to design a user interface for a mobile telephone handset.

- Identify the components of today's mobile phones, contrasted with other computing devices
- Overview of mobile design targets, including SMS/MMS, WAP, FlashLite, SVGt 1.2, and Java
- Discuss .mobi, BREW & UI One, Widsets, and other Mobile 2.0 technologies
- Present a process for designing information architecture for handheld devices
- Detail user interface design characteristics (widgets, features, etc.) for each handheld platform
- Introduce paper prototyping for handheld devices
- Address usability testing of handheld device prototypes and formal testing of hardware

3. TARGETED AUDIENCE

Intermediate. Attendees are expected to have a basic background in desktop software and web site design, prototyping, and usability testing. However, this tutorial provides review of all of these concepts.

In the past, this tutorial has attracted participants with a wide range of experience. Attendees have ranged from desktop usability experts to user interface designers for handset manufacturers and telecommunications carriers. Participants have praised the breadth and depth of the material. We maintain that the target audience is an individual with a good understanding of user interface design and usability testing, but who is interested in learning how to apply those principles to the handheld platform. However, the breadth and depth of this material does apply to practitioners already working in the field of handheld devices. For most attendees there will be some review and mostly new material.

4. PRESENTER

Scott Weiss is the Principal of Usable Products Company, an ease-of-use consultancy focused on mobile device usability and design. Usable Products' clients include Cisco, Google, Intel, LG, Microsoft, Nokia, Samsung, Sprint, Sun Microsystems, Verizon, Virgin Mobile USA, and Vodafone. Scott's work experience includes career positions at Apple, Microsoft, Sybase, and Autodesk. His design work spans contributions to Macintosh System 7.0, Microsoft Windows 95, and Microsoft Schedule+, the predecessor to Microsoft Outlook. He is the author of "Handheld Usability" (Wiley: 2002), the pioneering text on mobile UI design, usability, and prototyping. He has lectured and/or taught at Parsons New School University, Stanford University, Carnegie Mellon, NYU, ACM's SIG-

CHI, DIS, HFES, AMIA, UPA, MEX, and Mobile HCI.

5. JUSTIFICATION FOR MOBILE HCI 2007

This tutorial, taught since 2001, has been fully updated in 2007 to cover current mobile design environments, including Mobile 2.0 targets such as SVGt 1.2 and Widsets. Traditional design environments are included, since many mobile designers will benefit from review of SMS UI design, WAP's present capabilities (and how .mobi sites relate), and new data about penetration of various technologies.

This tutorial was designed specifically for user interface designers, developers, technical writers, and educators with experience designing for desktop software and web sites. The new ground this tutorial covers is how traditional user-centered design practices are applied to design, prototyping, and usability testing of applications for phones. Comprehensive exercises have been woven into the course material so that key concepts are practiced by attendees, and they are given the opportunity to work together on projects that directly interest them.

6. DESCRIPTION

Mobile phone UI design keeps changing, and yet SMS and WAP are still around. New technologies such as SVGt 1.2 and Widsets are around the corner, and today's designers need to know all of the design opportunities at their disposal. This tutorial provides user interface designers and usability specialists with the information resources and training needed to design, prototype, and test usability of applications for mobile phones.

6.1 Background of the Handheld Device Platform

The day begins by providing attendees with a fundamental understanding of handheld device user interface issues covering the following topics:

- Survey of design environments and penetration in Asian, European, and American markets

- Overview of handheld device hardware and software user interface elements
- Discussion of SMS, WAP, Java, IMS, and other technologies that enable users to access data

6.2 Information Architecture in the Handheld Medium

Discussion of how generally used IA processes can be applied to phones. Audience definition, task analysis, and information architecture will be presented. Mobile UI structures will be discussed, along with methods of documenting designs, issues of nomenclature, and navigation structures. For the first class exercise, a brainstorming session will be conducted to identify several user interface applications for phones. Attendees will select which UI they wish to design and prototype, and be assigned to teams, accordingly.

6.3 Online and Paper Prototyping

This section will start with a discussion detailing major considerations of prototyping a handheld application including device differences, a survey of software tools available, and the pros and cons of different strategies. Based on the site architectures developed in the previous section, the exercises in this section are aimed toward the development of a richly detailed prototype. The exercises will build skill and confidence in paper prototyping, and provide the material to be used in the final section of the tutorial.

6.4 User Testing of Handheld Devices

The evaluation of UI designs is presented in this section. A user testing lab setup for handheld devices is discussed, including issues related to developing a participant screener, tasks, data recording, and room/equipment setup. Variations of this structure are explored. Quick usability tests of two of the prototyped user interfaces will be conducted to demonstrate handheld device usability interview strategies. Issues regarding the interaction are noted, and possible solutions are devised.

7. REFERENCES

- [1] Weiss, Scott. *Handheld Usability*. John Wiley & Sons. 2002.