iPhone/iPad Human Interface Design

Conference Paper · November 2010

DOI: 10.1007/978-3-642-16607-5_34 · Source: DBLP

3 authors:

Martin Ebner
Graz University of Technology
451 PUBLICATIONS **3,037** CITATIONS
SEE PROFILE

Christian Stickel
University of Applied Sciences Fulda
19 PUBLICATIONS **162** CITATIONS
SEE PROFILE

Josef Kolbitsch
Universität Mannheim
26 PUBLICATIONS **370** CITATIONS
SEE PROFILE

Originally published in: Human-Computer Interaction in Work & Learning, Life & Leisure, Leitner, G., Hitz, M., Holzinger, A. (ed.), Springer, 2010, S. 489 - 492

iPhone/iPad Human Interface Design

[1] M. EBNER, [2] C. STICKEL, [3] J. KOLBITSCH

CIS / Dept. Social Learning
Graz University of Technology
Steyrergasse 30/I,
A-8010 Graz
[1] martin.ebner@tugraz.at, [2] stickel@tugraz.at, [3]josef.kolbitsch@tugraz.at

Abstract: In this tutorial, we will present the Human Interface Guidelines for both iPhone and iPad and offer hands-on experience in designing user interfaces for these devices. We will also discuss how to integrate the guidelines in higher education and give examples from our lecture on iPhone application development. The goal of the tutorial is to provide the participants with a basic understanding of the iPhone Human Interface Guidelines and enable them to review and design iPhone apps according to the standards.

Keywords: usability, design, human computer interaction, mobile devices.

1. Introduction

Taking a closer look at the market of mobile devices, it can be seen that the largest growth rates can be found among mobile devices with mobile Internet connections. According to the latest AdMob Mobile Metrics report, "*the mobile Internet devices category experienced the strongest growth of the [smartphones, feature phones, mobile Internet devices], increasing to account for 17% of traffic in AdMob's network in February 2010*." [4]. Platforms for mobile phones such as Symbian, Android, and iPhone OS become increasingly popular [7]. With the special capabilities of these platforms on the one hand and the restrictions of mobile environments on the other hand, user design principles and mobile usability testing needs to be reconsidered [1], [2], [3].

New interaction and usage paradigms, for instance, on the iPhone have an impact on the way end users interact with ubiquitous devices according to [6]. Jakob Nielsen coined the current situation appropriately, *"Mobile Web 2009 = Desktop Web 1998"* [5].

2. Motivation

Considering the opportunities on, and distribution of, Apple's iPhone and iPod Touch, Graz University of Technology decided to give a lecture on iPhone development to provide students with a fundamental and comprehensive of mobile device development. The lecturers aimed not only to teach the actual programming skills required, but also to put an emphasis on usability and user interface design principles. This was achieved by a dual approach: human computer interface guidelines were taught, and a cooperation with a secondary level design school was struck. The design school's experience was support students in user interface design.

Students implemented iPhone apps for real-world problems from two domains: business applications and educational applications. The lecturers attempted to find out if it is possible to create useful and valuable apps during a lecture series, and how innovative usability can be brought to the next generation of programmers. Based on the insights from this lecture, this tutorial will provide information on the outcome of the lecture, the teaching process, and the content taught.

3. Description of the topic

iPhone, iPod Touch, and iPad are sophisticated mobile devices using "multi touch" technology, which enables advanced and intuitive user interactions based on gestures [10]. It is frequently said to be more intuitive than other mobile devices which results not only from the large touch screen or the flashy behavior of the elements. A key factor of this appraisal is the flat hierarchy with only one top level menu and one physical button. This single button provides an all time consistent way to the top menu. Since it's a small mobile device the interface aims to be as simple and consistent as possible. The balance between an exciting interface with intuitive interactions and practical functionality can be held account for adding an emotional appeal, which in the end might explain its success on the consumer market.

iPhone OS is the operating system running on these devices. In order to create applications for iPhone OS, developers have to use the iPhone SDK that is freely available at the Apple Developer Connection web-site. The SDK includes several tools for software development, whose most important parts are Xcode and Interface Builder. Interface Builder allows developers to design applications with an extensive library of interface objects. However, in order to create applications with the typical "look and feel" developers need to know about the recommended use of these UI elements. The iPhone Human Interface Guidelines therefore explain which kind of applications can be developed. Broken into four sections, it introduces developers to some of the concepts and paradigm shifts that they'll need to grasp before developing for the iPhone. The HIG help incorporating the key aspects of the iPhone's unique UI into development.

4. Tutorial procedure

In this half-day tutorial, participants will be given an introduction to the fundamental human interface design principles for iPhone and iPad apps. This tutorial will help designing and reviewing iPhone and iPad apps, with a focus on the creation of an exceptional user experience. Participants are HCI practitioners, educators as well as PhD students in the field.

The tutorial will have three parts. In the first part, Apple's iPhone Human Interface Guidelines are presented and examples from the lecture on iPhone application development held at Graz University of Technology are given. In the second part, the tutorial participants will practically utilize the guidelines in a sample iPhone application, will evaluate the design of the sample interface, and come up with ideas to improve the app. The outcome of this analysis and improvement process will be discussed in the third part of the tutorial.

4.1 Guidelines

In the first part, an overview of the iPhone/iPad guidelines is given [8], and several essential parts are discussed in depth. Therefore we will share examples from the lecture "Advanced Topics of Media Technologies" in which iPhone application development is taught at Graz University of Technology. The topics in this first part will be: planning an iPhone app, user-centered design, elements of typical iPhone UIs, and design of the actual UI. Since Apple frequently applies user-centered design in software development, participants owning an iPhone, iPod Touch, or iPad are invited to think about the principles in their favorite apps and will be encouraged to demonstrate them to the fellow participants.

4.2 UI Design

The second part is a hands-on tutorial during which participants will be able to design the interface of a new iPhone app. The topic of this app will either be defined by the presenters or can cover a genuine idea raised by the participants. The sketching can be done with pen and paper on pre-printed templates or with an iPhone mockup tool (e.g., [9]). Material for the UI design phase will be provided.

The design phase will introduce the technologies particularly available on the iPhone—from multitouch to accelerometers. During this phase, also the limited resources available on mobile devices will be taken into account where appropriate—the relatively low CPU speed, a limited amount of memory, potentially slow network connections, limited screen size.

4.3 Discussion and Analysis

In the third part, the participants of the tutorial will present and discuss the results from the previous parts and evaluate the apps according to the guidelines.

Furthermore a deeper insight in the teaching process is provided to give participants the possibility to plan a lecture or a workshop on their own. On request, an introduction to the administrative steps for iPhone development courses required by Apple can be given.

5. Conclusion

This tutorial will enable participants to get a detailed introduction on both the theoretical background and the practical aspects of UI design on the iPhone OS platform. With the information provided during this tutorial, participants will be able to teach UI design for iPhone and iPad, will be able to organise and administer a university-level course on this topic and will be capable of producing the required course materials.

References

[1] Kjeldskov, J., Stage, J.: New techniques for usability evaluation of mobile systems. International Journal of Human-Computer Studies, 60(5-6) (2004) 599-620

[2] Zhang, D. S., Adipat, B.: Challenges, methodologies, and issues in the usability testing of mobile applications. International Journal of Human-Computer Interaction, 18(3) (2005) 293-308

[3] Venkatesh, V., Ramesh, V., Massey, A. P.: Understanding usability in mobile commerce - Ramifications for wireless design: 'E' not equal 'M'. Communications of the ACM, 46(12) (2003) 53-56

[4] AdMob (2010) AdMob Mobile Metrics Report, February 2010, http://metrics.admob.com/wp- content/uploads/2010/03/AdMob-Mobile-Metrics-Feb-10.pdf (last visited April 2010)

[5] Nielsen, J.: Mobile Web 2009 = Desktop Web 1998, Alertbox, http://www.useit.com/alertbox/mobile-usability.html. (last access: February, 15,2009)

[6] Weiser, M. (1991) The computer for the twenty-first century, *Scientific American*, 265 (3), p. 94-104

[7] Admob Mobile Metrics, January 2009 (Report can be downloaded from http://metrics.admob.com/)

[8] iPhone Human Interface Guidelines, http://developer.apple.com/iphone/library/documentation/UserExperience/Conceptual/MobileHIG/MobileHIG.pdf

[9] iPhone Mockup tool (http://iphonemockup.lkmc.ch/)

[10] Apple's iPhone 3GS has 99 percent satisfaction rate (http://www.appleinsider.com/articles/09/08/14/apples_iphone_3gs_has_99_percent_satisfaction_rate.html; last visited March 2010)