

Generation of usable interfaces for mobile devices

J. Alfredo Sánchez, Oleg Starostenko
ICT Group/CENTIA
Universidad de las Américas, Puebla
Cholula, Puebla 72820 México
{alfredo, oldwall}@mail.udlap.mx

Eduardo Aguilar Castillo, Marisol González
ICT Group/CENTIA
Universidad de las Américas, Puebla
Cholula, Puebla 72820 México
eduard_aguilar01@yahoo.com

ABSTRACT

We report on our work aimed at the generation of interfaces for mobile devices that comply with usability guidelines. We conducted a usability study that led to the definition of ten general usability guidelines for mobile devices. We then modified our existing software platform for mobile interface generation so that it enforces the proposed usability guidelines.

Keywords

Mobile devices, usability guidelines, generic interfaces.

INTRODUCTION

We have been working on a software platform for automating the generation of interfaces that are suitable for rendering on mobile devices with display and processing limitations, such as PDAs and mobile phones. Our general approach is based on the notion of *generic interfaces*, which specify interface elements in a way that can be interpreted, transformed (or *transcoded*) and rendered according to differing characteristics of various devices [1].

Our initial results include a prototypical environment that allows designers to specify existing user interfaces using XML and to generate interfaces for mobile devices (in XHTML or WML) with equivalent functionality. In order to test this environment, we used it to successfully produce the mobile device version of our concept of personal spaces for digital libraries. We referred to this environment as Portable Personal Spaces, or PoPS [2]. Further previous work includes graphical interfaces to support the entire conversion process, from edition and specification in XML to validation, previewing and refinement of interfaces. We referred to this environment as EditMOS [3].

From our experience with PoPS and EditMOS, it became clear that the process of generating interfaces for mobile devices contributed in speeding up the process of making existing applications available to mobile users. However, though functional, the resulting interfaces typically exhibited some usability problems that appeared amenable to being addressed during the conversion process.

USABILITY STUDY

Prior to modifying our interface generation platform to cover for usability problems, we decided to conduct a formal usability study involving PoPS and other interfaces for mobile devices generated via EditMOS. We collected data from user observation using the “constructive interaction” method with ten pairs of users of PDAs and cell phones.

USABILITY GUIDELINES FOR MOBILE DEVICES

Ten usability guidelines for mobile devices were derived, some of which confirm others reported in the literature: (1) Provide a “back” option; (2) Provide “exit” alternatives; (3) Allow for “exit” confirmation; (4) Avoid blank lines; (5) Make headers look different from regular text; (6) Use at most two different font faces per web page; (7) Limit links to one line; (8) Provide thumbnails for images; (9) Use contrasting colors; (10) Limit table width.

GENERATING USABLE INTERFACES

We modified our EditMOS environment to make sure the resulting interfaces for mobile devices comply with the guidelines we derived. At present, we have focused on PDAs, so changes have implied mainly the introduction of new XSL directives for the stylesheets that implement each of the guidelines when generating XHTML interfaces from XML specifications. We successfully have applied the modified conversion process to a number of public web pages. When comparing the newly generated interfaces for PDAs with those produced by the previous version of EditMOS, significant usability improvements have been observed.

REFERENCES

1. Abrams, M., Phanouriou, C., Batongbacal, A., Williams, S., and Shuster, J., “UIML: An Appliance-Independent XML User Interface Language”, Proceedings of the World Wide Web Conference, Toronto, May 1999.
2. Castellanos, N., Sánchez, J. A. 2003. *PoPS: Mobile access to digital library resources*. Proceedings of JCDL 2003 (Houston, Tex., May).
3. González, M. 2005. EditMOS: Un ambiente gráfico para generar interfaces para dispositivos móviles. B. Eng. Thesis. Universidad de las Américas, Puebla, México.