

Designing Successful Mobile Applications

By James Hobart, President, Classic System Solutions
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As with any emerging technology, we are in a period of discovery with mobile computing. Usability plays a major role in this discovery equation. Best practices still apply, but they need to be mapped to a new paradigm -- the mobile interface.

This year, many large organizations are deploying mobile solutions to their field service workers and attaching mobile solutions to leverage existing ERP implementations. The end users who ultimately strive to be more productive with this new breed of user interface will largely determine the success of these mobile solutions, as the wireless Internet becomes a reality.

Our work on several large-scale enterprise mobile design projects has led to some discoveries in the area of usability, which seem to repeat themselves across several vertical industries. We have a lot more to learn, however the following ideas should help shed some light on the process of creating successful mobile interfaces.

Importance of the Form Factor

We view the form factor of the mobile device as an integral part of the presentation model look and feel of the mobile solution. To date, our research has shown telephone form factors to be overly restrictive in all but the simplest of tasks. Palm and CE devices allow for a larger interface; however, our experience to date in running either Java applications or browser applications has been somewhat disappointing. Specifically, we have found that the limited screen real estate and limited processing power of the current palm devices is very restrictive for performing moderate to complex line of business applications. In addition, we have found stability issues in running the latest release of J2ME (Java 2 Micro Edition) on these devices. Mid-size devices, like the Epoch Psion, allow for direct keyboard entry and better Java support; however, the larger than palm/CE form factor can be a problem in some deployment scenarios.

Separate the User Interface from the Business Logic

Many of the new mobile applications will need to support 'occasionally' connected users. This need presents significant data replication/synchronization issues for enterprise systems. Our experience has found that using a 'best practice' of separating the user interface from the data and logic layers will provide your team with more flexible options for deploying your back-end content with a variety of front-end mobile devices.

By using this approach, your team can implement an XML-based message format to exchange data between the server and various client devices.

Rethink your Interface Design

Transferring your existing client/server or web design into a mobile application can be difficult. Mobile devices support a wide array of screen sizes and resolutions. You will also need to support both horizontal and vertical screen layouts.

The most troublesome usability issues arise when you try to implement complex, multi-step tasks that are so common with enterprise applications. For instance, the task of capturing the details of a sales order on a mobile device can be very cumbersome and time consuming as compared to using a paper-based method or traditional full-sized laptop. Implementing complex tasks such as this require a rethinking of the design and the methods used to collect the sales order data. The use of additional defaults, role-based personalization of the user interface, and extensive use of progressive disclosure techniques to shield non-important data from the user are critical for creating usable, complex mobile applications.

In addition, you need to rethink normal navigation and content display to deliver clear, concise content with minimal navigation menus, so that the limited display area can be devoted almost entirely to the content in front of the user. Of course, you must completely rethink complex desktop interaction techniques, like drag and drop and multi-windows, and address them with visual design patterns more suited for the limitations of a mobile deployment platform.

Perform Usability Testing

Maturity of best practices and known successful design layouts for mobile computing are still in the formative stages. New mobile devices are being introduced at an ever-increasing rate with little effort towards industry-standard display sizes, button placement, and physical form factors. As your team establishes new designs to address your mobile work force, you need to move beyond the situation of having each developer promote a particular opinion on interface design styles and instead validate your decisions with formal usability testing. This process will provide a statistical and factual basis for your design decisions and more adequately ensure that your design will be successful when deployed in the field. Our experience has shown that field workers expect their mobile devices to be both intuitive and reliable and to use their new mobile applications with little or no training.

Implement Mobile Design Standards

Once you have established successful mobile designs and have validated your assumptions with formal usability testing, you need to document and capture these best practices to leverage your design work across all of the teams in your organization. These standards, checklists, and developer resources should be stored in a centralized web-based standards repository that is available to all of your developers, product managers, and others with influence over the user interface of your mobile solutions. A self-managing process needs to be implemented that encourages developers to follow and use the standards, thus, ensuring consistency and high levels of quality across the applications deployed on your mobile devices.

Successfully deploying your mobile applications requires a very close working relationship with your end users and product managers. Mobile solutions are deployed on very personal devices that are used while

performing other tasks such as driving, walking, and meeting with other people. If your design forces the user to focus on the interface and not at the task at hand, lower productivity and poor user acceptance will likely result. Creating a seamless interface with the proper form factor and matched with appropriate user tasks can create a very empowering environment for your end users. This can enable them to gain significant productivity benefits from the emerging wireless web.

About the author:

James Hobart is an internationally recognized user interface design consultant based in California, USA. He specializes in the design and development of large-scale, high-volume client/server and web applications. He is an expert in GUI design for transaction processing systems and strategies for migration to thin-client graphical user interfaces. He can be reached at jimh@classicsys.com

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