

Turning Wireless Technology into Enhanced Mobile Experiences

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From smartphones to netbooks and everything in between, mobile devices are rapidly changing the way in which the world communicates. New platforms, operating systems and application frameworks are altering the embedded mobile playing field, driving the need for developers to stay ahead of market trends and end-user expectations. The new game has developers more focused on understanding the different technologies being used, and how each can create enriched mobile experiences that match to shifting end-user demands.

Understanding the End-User

In order to be successful in creating next-generation mobile experiences, evaluating and understanding the differing needs of how the device will be used by the end-user is an important first step in the design and development process. Before getting started on the creation of a device, it needs to be determined who the end-user is, whether it's a general consumer or a business professional; as the demographic may require different embedded device elements. The distinguished aspects in usage model definition (leisure versus business) and usage environment definition (i.e, outdoors) play major factors in deciding which elements or applications need to be incorporated into the design. Since end-users in various global markets often have contrasting demands, and mobile operators around the world have different network specifications, mobile device developers need to learn what is most important to the device audience, to best plan accordingly. Understanding these end-user characteristics is critical for creating a mobile device that delivers an enriched user-experience.

Defining the User-Experience

When designing and developing next-generation mobile devices it's important to engineer products with the flexibility to accomplish more than just routine tasks, and provide the power of 'mobile freedom' in the palm of one's hand. Today's end-users are more sophisticated. Their requirements, as we all know, go beyond voice to now wanting the computing power of their PC in a sleek, compact mobile form factor.

There is a global increase in devices that offer a touchscreen experience with haptics sensitivity feedback, and developers must understand how this cutting-edge technology works. For example, when the end-user interacts with the touchscreen, the device should automatically detect finger proximity from the touchscreen and

recognize its presence, which then signals the integrated circuit controlling the touchscreen to react, intuitively. The controller should read the circuit and apply filters and other mathematics to the signals to determine the correct finger touch status. Finger presence, location, speed, and pressure are then calculated and the information is passed on from the controller to the host system, which is in control of the UI (user interface). The next step is for the host system to recognize the message from the touch controller, which starts to drive the sensation-based physical feedback from the finger. At the same time, the UI will recognize the action and visually respond to the end-user by highlighting the icon and starting the application. When completed properly, this process should take the device less than 30 ms to execute.



Designing to Enrich User-

Experience

Being able to establish a proper balance between a device that is powerful, yet conservative in terms of energy consumption, is one of the most difficult equations facing developers. The challenge is to offer a seamless Internet experience, which requires a strong processor, while also managing the power management of the device. At the same time, it's necessary to define a set of appealing core peripherals for the device. For example, the product concept for Mobile Internet Devices (MID) includes display, multiple cameras, connectors, and other wired and wireless interfaces. These elements need to work together seamlessly in order to create a comprehensive package supporting all of the key use-cases from the core hardware level to the end-user. If the wireless link to the Internet is poor, then the advanced processor in the device will not be able to deliver a quality experience. Creating this harmony among the technologies can be one of the strenuous stages of the development process, and one in which engineers need to pay particularly close attention.

The Importance of New Technologies and Open Source Platforms

Today's devices are functionality-rich with advanced software solutions. For complex devices such as MIDs, an extensive amount of software is required to deliver the best end-user experience. Enter the open source community - where here in lies the opportunity to tap the genius of the global developer community and leverage platforms such as Qt to further enable developers to build innovative

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applications and user interfaces. But 'buyers beware,' the downside is that often times developer community solutions are not specialized; leaving a need for even the most mature components to require customization. However, there are ways to circumvent this challenge; because it's merely an issue that needs to be acknowledged and then acted upon accordingly during the development process. In addition, next to the technology selections there are several aspects that need to be taken into account, such as: visualizations in UI level, industrial design, first time usage and out-of-the-box experiences, device-specific value-adds, and other similar elements. Ultimately, the core technology choices are as important as the look-and-feel of the device itself.

Summary

While end-users typically do not understand the differences in processor microcode architectures or the distinctions in operating systems or open source policies, these details play key roles for mobile developers. It is only by coupling the strongest technical understanding and proper market intelligence on operator requirements and end-user demand, with a passion to create out-of-the-box, user-friendly devices, will it be possible to deliver unique and exciting mobile experiences that elevate communications and end-user expectations.

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