

The Elusive Goal of Simplicity

Information Appliance Visions Are Easy—But Can Reality Ever Match Up?



As discussed previously (see [MPR 10/5/98, p. 19](#)), I believe we are at the brink of the age of information appliances. By focusing on a single application and shedding the baggage and complexity of the PC standard, information appliances could make computing safe for the masses—and they are likely to create huge demand for low-cost but high-performance embedded processors.

It is easy to conjure up visions of the new world. Here are a few possible devices that could be extremely successful.

Internet Slate: The size and shape of a pad of paper, with a high-resolution color display and a wireless high-speed Internet connection. Used primarily for Web browsing and e-mail. Input is via stylus (handwriting or pointing) or voice.

Photo Server: A photography appliance. Any digital camera plugs in and is automatically recognized. With one button press, all the pictures in the camera are copied to the Photo Server's hard drive. A pop-up LCD screen allows pictures to be viewed and slide shows assembled. Pictures can be printed with a simple button press—or sent via the Internet to a printing-service provider. Audio can be recorded as an annotation for each picture.

Navigator: The screen shows a map of the area you are in with a mark to show where you are. On the basis of voice commands, it will locate any address and provide directions. It also offers lists (and reviews) of restaurants, bookstores, and myriad specialty stores in any geographic area.

If just the three appliances described above were affordable and widespread (and worked well!), they could constitute a market for hundreds of millions of devices—and involve far more people than ever before in the digital world. These products could change the way ordinary people read news, get entertainment, send mail, deal with photographs, and find where they're going. And this is, of course, just a short list of possible devices: personal organizers and game consoles are already widespread, electronic books are starting to appear, and digital cameras are moving into the mainstream.

The three devices listed above all exist in some form today, but none has achieved much success. In each case, the technology isn't quite ready to enable a great device. Displays are too small and too expensive, and backlights consume too much power. DRAM and hard-disk capacities aren't quite large enough. Processors aren't quite fast enough. Handwriting and voice recognition aren't reliable enough and take too much computing power. Batteries don't last long enough, are too expensive, and are too much trouble to recharge. Wire-

less communications are slow and erratic. User interfaces are often hard to learn and tedious to use.

Formidable as the list of hurdles may be, most of them will cease to be limiting factors within 10 years. Faster processors, larger memories, and better algorithms will make speech recognition effective for certain applications; low-cost disk drives will become big enough to hold tens of thousands of good-quality pictures; displays will ride down the price curve; in-building, regional, and worldwide wireless communications systems will be widespread; lower supply voltages will extend battery life; and so forth.

Technologists tend to look at the devices I've described and say they're all the same; they are just PC (or thin-client) applications. From the user's perspective, though, each does different things, at different times, in different places. To achieve the simplicity that is so easy to describe but so hard to create, designers must fully optimize the device for a specific application. This narrowness of purpose should enable dramatic improvements in ease of use—though I suspect the reality, when appliances like these are common, will be more complex and troublesome than the vision.

The biggest difficulty designers of such products are likely to struggle with is making tradeoffs between capability and complexity. How are slide shows assembled? Can photos be edited or collaged? An appliance-like user interface will have to limit the richness of the task to achieve ease of use. The enduring role of the PC may be for those users who want more richness, who are willing to accept higher complexity and more difficulty in return for greater power and flexibility. Information appliances may make digital technologies far more approachable, but many are likely to be unsatisfying for power users. The very best products will be easy to use for common functions but will have ways to expand their capabilities—perhaps by connecting to a PC—to meet the needs of more sophisticated users.

As the enabling technologies continue to advance, there will be an explosion in the variety and success of information appliances. Tremendous challenges—and great opportunities—lie ahead in creating new product categories and in building in all the complexity that enables devices to seem simple. But don't count out the PC: it will (we can only hope) be much different from today's PC, but powerful, general-purpose computers also will thrive. In the long run, information appliances may displace some PCs, but for the most part they represent a new market. ■

See www.MDRonline.com/slater/simplicity for more on this subject. I welcome feedback at m Slater@mdr.zd.