# Electronic Books Stuck in Niches

## *Widespread Use Is Likely—But Probably a Decade or More Away*

During the past six months, several electronic books have become available. The emergence of this first crop of devices—tablet computers dedicated to displaying a book—is a landmark event. Ultimately, advances in hardware technology, combined with a large library of content, will make electronic access to books widespread. This will be a long, slow process, however, and dedicated electronic books (e-books) may forever be limited to niches.

The e-books available today are notable for their pioneering role, but they show the hallmarks of first-generation implementations: they have limited content and capability and are slow, heavy, bulky, and expensive. For a few applications, such as portable access to service manuals or large sets of reference documents, e-books are compelling today. But for ordinary use as a replacement for a book, they fall flat. The technology just isn't ready to deliver a great product.

As a reading experience, current e-books are vastly inferior to even the cheapest paper books. The contrast of the display, as well as the book's weight and size, are much worse than for paper books. Content is harder to skim or annotate. The text can be hyperlinked, but for most books this is not very important.

The benefits come primarily from the ability to store multiple books in a single device and to load new content as desired. For some niche users, such as airline mechanics, these benefits are overwhelming. But for most people, the drawbacks far outweigh the benefits.

To become successful in the domain of ordinary books and ordinary readers, e-books must improve dramatically. Today's microprocessors are acceptable; faster processors will provide a marginal benefit, but speed is the least of the e-book's problems. Denser memory chips and tiny yet high-capacity hard drives are important, but they are coming.

The most problematic area is the display. LCD displays continue to improve, but even at their best, they are far from delivering the contrast, brightness, or resolution of a printed sheet of paper. Compared with paper, they are stiff, fragile, bulky, heavy, and expensive.

Xerox PARC and E-Ink, a spinoff of the MIT Media Lab, are working on digital paper: a display that is literally a piece of paper. Some versions require a "printer" to write on them; others have built-in electronics and can change themselves, just like an LCD display. The potential of this technology offers a tantalizing glimpse of a world in which digital devices could have a radically different feel.

Digital texts can be accessed from any computer with a Web browser. Digital book content will be widely used, but most of it will be viewed on or printed from PCs or other Internet-access devices; dedicated e-books will play a minor role until they are vastly improved.

Do we need dedicated e-books at all? E-books dispense with the complexity of notebook computer software, are less expensive, boot quickly, and are easier to hold and to use. They are very limited, however, not supporting even Web browsing. Focusing on a narrow capability is important for information appliances, but in this case, the capability should be "reading," not "reading books," and much of what people will want to read will come from the Web. A refined Internet Slate is perhaps the mature form of the e-book.

As for content, more and more books are being made available in digital form. In addition to current books sold by e-book vendors at prices similar to those of paperback books, Project Gutenberg has put online more than 1,500 texts that are in the public domain (such as the Bible) or whose copyrights have expired (including most classics).

Unfortunately, the economic model isn't there for most books to be put online today. Decades ago, Ted Nelson described the Xanadu system of hyperlinked information, foreseeing many aspects of the Web. Integral to the Xanadu vision was a micropayment system that paid each author a small sum every time his or her content was accessed. The Web has yet to implement such a system, however; there are no good mechanisms to protect authors' rights. As a result, the Web is a great way to give away information but not a place to sell commercially valuable books in digital form.

Electronic forms will replace periodicals and short-lived books sooner than they will replace traditional books. Cutting down tens of thousands of trees to print the Sunday paper or a new set of phone books just isn't acceptable given the current state of technology and of the world.

No matter how successful electronic media become, printed books won't disappear. There is something in the aesthetics of a book that will endure, and it will remain a paragon of portability, ease of use, and reliability for a long time. The permanence of a book gives it an entirely different character than electronic content, which is ephemeral. I cherish the books I have kept from my childhood to share with my children or that have other significance as historical artifacts; it is hard to imagine any electronic book holding that kind of value.   Ⓜ