

## EMERGING TECHNOLOGIES

### E-Books and the Tablet PC

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Recently introduced computer hardware, the Tablet PC, has sparked renewed interest in electronic texts or e-books, as they are most commonly called. This new hybrid of laptop computer and PDA (personal digital assistant), which features a writing tablet and stylus-based input/navigation, offers compelling advantages for reading and writing texts, including interesting possibilities for working with non-Roman writing systems. The addition of wireless networking, integrated into most models, provides intriguing opportunities for collaborative and classroom use.

#### Texts to Go

Electronic versions of texts have a long history in the digital age. Michael Hart began his [Gutenberg project](#) in 1971, with the goal of creating a widely-available library of texts of all kinds in plain text format. Similar Gutenberg projects have since been introduced in other countries, notably in [Germany](#) and [Australia](#). Electronic text centers, such as those at the [University of Virginia](#) and [Columbia University](#), have created extensive collections of electronic texts accessible over the Internet. There have been long-term projects for making available digitized versions of texts other than English, such as the [ARTFL](#) French literature project or the [Perseus](#) classics collection. In the mid-1990's, the exponential growth of the Internet and the introduction of new formats and devices for reading texts created media buzz about e-books with predictions of the imminent demise of the printed page. Subsequently, however, disappointing sales, the dotcom bust, and the failure of experiments such as Stephen King's serial publication of [The Plant](#) dampened enthusiasm for the promised revolution in publishing.

E-book vendors and apostles, however, continue to tout the supremacy of digital over print texts, emphasizing the ability to search and annotate, the portability (thousands of text on a disk), and the instant access (through downloading). For many consumers these benefits do not outweigh the major drawback of e-books - the user-friendliness and familiarity of print when compared with electronic devices. For most people reading a text on paper is always preferable to reading the same text on a digital display of any kind. The availability of desirable texts has been another problematic issue. What is widely circulated for free on the Internet are works in the public domain, not current bestsellers (although bootleg copies abound). The recent extensions of copyright in the United States and Europe further limit copyright-free texts. Given the experience of the music industry, publishers have not been eager to release their lists in digital format, for fear of Napster or Gnutella like distribution of copyrighted works. Software companies and e-book vendors have in recent years found ways to restrict usage of purchased e-books which satisfy many publishers. As a result, e-book titles of many recent publications are now offered for sale on [amazon.com](#) and [Barnes and Noble](#), both of which have recently experienced significant growth. The on-line vendor [ebooks.com](#) (Australia) has also experienced fast growth in the past year.

#### Formats

The e-books available for sale are usually offered in several different formats. In fact, the proliferation of different -- and mutually incompatible -- e-book formats have been one of the major inhibitors of more widespread acceptance. While e-books can be created in formats such as plain text or HTML, which are non-proprietary, universally accessible, and easy to produce, these formats do not offer much flexibility in terms of display, organization, and searchability. Nor do they provide for the digital rights management (DRM) publishers demand. The formats most used today by commercial e-book providers are [Microsoft Reader](#), [Adobe eBook](#), and [Palm Doc](#). All provide for rights management and restricted access (although

managed in different ways), and allow for sophisticated formatting and display options. New font technologies employed by Microsoft Reader ([ClearType](#)) and Adobe ([CoolType](#)) enhance considerably the screen legibility of text. However, both are proprietary formats incompatible with each other and usable only on specific hardware running Microsoft Windows. This is true as well for other formats such as [Gemstar](#) or [hiebook](#). The document type which is most widely supported across platforms and devices is Palm Doc, which uses a plain text format, thus limiting display options.

Since 1999 there has been an initiative underway to create a common format for e-book readers, the "Open eBook publication specification" ([OEBPS](#)) created by the [Open eBook Forum](#), a membership organization consisting mostly of large companies and publishers. The Open eBook format is based on open standards, namely XML (extensible markup language). An OEBPS converter for a free hypertext reader, [Plucker](#), has been developed. Plucker is an e-book (and offline Web) viewer for handheld devices that supports Windows, Macintosh, and Unix. Production tools for Open eBooks are being developed through [LiberGNU](#), a free software development project for the Open eBook standard. One of the challenges for the Open eBook project is rights management; efforts are being directed toward developing standards that allow the same usage rights for consumers no matter who is the publisher or software vendor. It will of significant interest to language teachers and humanities scholars if tools can be developed to enable interchange between the Open eBook standard and the new XML-based format for the long-running Text Encoding Initiative ([TEI](#)). A large number of language corpora, archival materials, grammars, and literary texts are encoded in TEI, including texts in 33 different languages. Making selective TEI texts available as Open eBooks would provide a potentially rich resource for language learners and researchers.

### **Tablets: The Future of Mobile Computing?**

E-book enthusiasts are confident that the arrival of Tablet PC's will provide a big [boost](#) to the popularity of e-books. The assumption is that a Tablet PC with its high-resolution screen, handheld convenience, and large display area, will provide an attractive text reading environment. Microsoft released recently a [new version](#) of Microsoft Reader (2.5) to coincide with the launch of the Tablet PC with the assumption that text reading will be a major use of this new type of computer. It is too early to tell whether Tablet PC's will be a consumer success and corner a significant proportion of computer sales. Microsoft is confident that will be the case. In fact, Bill Gates, Microsoft founder and Chairman, has [predicted](#) that within 5 years the Tablet PC will be the most popular PC in the USA.

The Tablet PC, however, is not the first attempt to market a pen-based computer. There have been a string of commercially unsuccessful attempts, going back to the Tandy Model 100 in 1983, through the GRIDPad of 1989, to the Apple Newton in 1993. Microsoft itself has had mixed success with the [PocketPC](#) (originally introduced as WindowsCE in 1997), running a slimmed-down version of Microsoft Windows on a PDA. The most successful commercial product of this kind has been another PDA, the [Palm](#) (with units by Palm, [Handspring](#), and others), first introduced in 1996. The Tablet PC is not a PDA but a full-fledged computer running the current version of Microsoft Windows XP ([Tablet PC Edition](#), which adds additional programs and functionality) with all the capabilities of a laptop computer. Microsoft has created [programs](#) especially for the Tablet PC including Journal, a text entry program, and Sticky Notes. The Tablet PC operating system features "[Digital Ink](#)," a technology that enables written text to be used (either as is or recognized and translated into typed text) across a wide range of applications, effectively integrating it into the operating system. Microsoft is advocating the use of "Ink as Ink" (i.e., not having all written text automatically recognized) but in order to be fully searchable, handwritten text needs to be converted. As one might expect, user reports differ in their assessment of this aspect of the Tablet PC, but many have been favorably impressed with the accuracy and immediacy of handwriting recognition. In contrast to current PocketPCs and Palms, the "[active digitizer](#)" in Tablet PC's requires use of a special stylus and (in most models) is pressure sensitive, allowing for more sophisticated on-screen drawing. With PDA's the digitizer is located in front of the LCD (liquid crystal display), thus

reducing the readability of the display, while the Tablet PC places the digitizer behind the LCD. Also, the active digitizer recognizes only stylus input, so a wrist (or anything else) can be placed on the tablet with no problem. In fact, input is possible just by having the stylus hover within an inch or so of the screen.

In addition to better handwriting recognition, additional features of the Tablet PC distinguish it over its predecessors. By using low voltage processors, battery life is longer, while heat is reduced. Most models take advantage of the current very small, but powerful hard drives to provide large storage capacity (20-40 GB), thin profiles, and relatively light weight (3-4 lbs). Size is reduced also by not including floppy, CD or DVD drives -- they are used externally. All have built in networking, including in most models Wi-Fi (802.11b). The addition of wireless Internet access and ability to use normal email and Web applications is a significant plus for these machines over past pen computers and current palmtops. It should be noted, however, that Windows programs (as opposed to Palm applications) were not designed for pen-based input. Stylus navigation is awkward with many programs. Even Web browsing is a bit clumsy using the stylus, unless one is loading sites through point and click from a bookmarks or favorites list. It seems likely that most users will prefer to use the keyboard with traditional Windows programs and to use the tablet mostly for reading, writing, and drawing.

A number of different [models](#) are currently available from a variety of [manufacturers](#). They range in price from US \$1,500 to US \$3,000, depending on features and configurations. There are two principal types of Tablet PC's currently, "slates" and "convertibles," with a number of variations and hybrids. Slates are designed principally for stylus use but also can be used with an external keyboard (wireless or USB), which is usually included. Convertibles resemble more traditional laptops with built-in keyboards, but the screen can be swiveled and folded down to cover the keyboard for use as a tablet. Current display sizes are 10.4 or 12.1 inches. Whether consumers will rush out to buy these new machines remains to be seen. What seems likely, however, is that full-featured Tablet PC's will spell the demise of dedicated e-book readers such as the [REB 1200](#) (US \$700 with a leather cover) and may effect sales of PocketPC's as well. Lower-priced Palms may be less effected. Speculation is [rampant](#) that Apple (which recently added "[Inkwell](#)" handwriting recognition to its Mac OS X operating system) will counter Microsoft's move with a Tablet model of its own.

### **Applications for Language Learning and Teaching**

In order for handwriting on a Tablet PC to be recognized, there needs to be built-in support for that language and writing system. The current version of the Tablet PC's operating system supports a limited number of languages: English, German, French, Korean, Japanese, and Chinese (both traditional and simplified versions). Spanish, surprisingly, did not make the cut. No doubt, additional language support will be forthcoming with future upgrades to the operating system. [Speech recognition](#) is also a feature of Tablet PC's, with built-in support for English, Japanese and Simplified Chinese. Speech can be combined with pen input and is enabled through a new utility called "[Input Panel](#)." Voice recognition will be of significant interest to language professionals. A product already available for Tablet PC's, [RealSpeak](#) from ScanSoft, adds text-to-speech capabilities in 19 languages. Both voice recognition and text-to-speech, combined with natural writing input, could add a powerful dimension to interactive multimedia or Web-based applications.

The wireless networking built into most Tablet PC's offers powerful collaborative and in-class possibilities. The design of Tablet PC's make it an attractive alternative to laptops or PDA's in the classroom. Students can use their normal handwriting to take notes, which can later be recognized and organized. Digital ink can also be used as is, and in that format be incorporated into documents or shared with other students. A number of [software programs](#) have been introduced specially geared to the Tablet PC, including several that provide support for peer-to-peer interactions. [Colligo](#) supports peer networking of up to 10 users enabling chat, file exchange, and instant messaging. [Groove Workplace](#) is also a decentralized collaborative system (no server needed) and includes a number of interactive applications.

E-books, too, offer enormous potential for new uses of technology in teaching and learning. Once a text is digitized, it can not only be displayed and read, but can be manipulated in multiple ways. One obvious option is the addition of hyperlinks to reference works (on-line dictionaries, encyclopedias) or Web sites. E-book readers could also use wireless networking to interact with other readers or to automatically update content (e.g., in the case of periodicals). Audio conversion or short video annotations could be added as well; support for audio and video formats is included in the current Open eBook specification. Commercial content brokers ([ebrary](#), [netlibrary](#), [Academic Materials](#)) are making a wealth of digital texts available (mostly for libraries), often with links to supplementary materials. This small step could be followed by more powerful interactive applications that could turn static texts into learning tools. Before that can happen, however, a common format and universal rights management must be established and embraced by all major players.

### Resource List

#### E-book Information

- [Open eBook](#) Information on the Open eBook Forum
- [OEBPS](#) Publication specs for Open eBook
- [Ebooks on track to post record year in 2002](#) News report from ebook.com
- [ebook.com](#) Site dedicated to collecting up-to-date e-book info
- [Plucker](#) An offline Web and e-Book viewer for Palm
- [LiberGNU](#) Open source editor and browser e-book project
- [eBook Reader Devices Library](#) Links to a variety of e-book readers
- [OverDrive](#) Company which enables libraries to create e-books and manage rights
- [About eBooks](#) Information and links on different e-book formats
- [Planet eBook](#) News and links concerning e-books
- [LLLS English-German for PPC 1.0](#) Software for PocketPC
- [Instant Revision - German](#) Example of e-book (PDF format) for reviewing German (from ebook.com)
- [MemoWare](#) e-book collection for pdas
- [German Talking Phrasebook](#) Example of e-book (Palm format) for practicing German (from MemoWare)
- [Comparing eBooks](#) Good comparison of different features of e-book formats
- [Aportis](#) AportisDoc Mobile reader for Palm and PocketPC
- [Copyright Law Gets a Second Look](#) Concerning possible revisions of the Digital Millennium Copyright Act

#### Text collections and e-book vendors

- [Numilog](#) Vendor of French e-books
- [eBookMall](#) Bills itself as the world's largest selection of e-books
- [Academic Materials](#) Vendor of e-books in a variety of disciplines
- [Plucker Books](#) e-book collection in plucker format
- [The Online Books Page](#) Provides access to more than 15,000 books (U. of Pennsylvania)
- [Foreign Language Texts](#) From the Upenn Online Books collection
- [Electronic Text Collections in Western European Literature](#) Extensive list from the University of Virginia
- [Alex Catalog of Electronic Texts](#) Classic texts available in variety of e-book formats
- [Electronic Text Center Collections](#) Texts in multiple languages and formats (U. of Virginia)
- [Project Gutenberg](#) Long-running project for digitizing texts (most in English)
- [Electronic Full-text Sources](#) Links to multiple text collections in a variety of languages (U. of Chicago)

- [Text Encoding Initiative](#) Home Page of the TEI project for text encoding
- [Projects using TEI](#) Projects in 33 different languages
- [ARTFL](#) French Literature collection from the University of Chicago
- [Perseus](#) Classical literature and more
- [XML and Digital Rights Management](#) Links to DRM information

#### Tablet PC Information

- [Tablet PC in Education](#) Slide show
- [Tablet PC Comparison](#) Chart comparing features of announced Tablet PC's
- [First Impressions of the Acer C102i](#) User report
- [Victorian Laptop](#) MIT project for using a tablet PC with story telling
- [Should Apple Enter the Tablet PC Market](#)
- [Tablet PCs: The Killer App for Higher Education](#) From Syllabus Magazine
- [Will the Tablet PC be a write-off](#) Article which discusses language support (from InfoWorld)
- [RealSpeak](#) Text-to-speech system for use with multiple languages
- [The Digital Talking Book](#) Information on the XML-based project