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"The World in 2000," a publication of The Economist Group

Reading on paper is so much a part of our lives that it is hard to imagine anything could ever replace inky marks on shredded trees. Since Johannes Gutenberg invented an economical way to make movable metal type in the 15th century, making it possible to produce reading matter quickly, comparatively cheaply and in large quantities, the printed word has proved amazingly resilient. So how could anyone believe that sales of electronic books will equal those of paper books within a decade or so? First, it is worth remembering that paper is only the latest in a long line of reading "technologies" that were made obsolete each time an improved solution emerged. Pictures drawn on rock gave way to clay tablets with cuneiform characters pressed into the clay before it dried. Clay gave way to animal skin scrolls marked with text, and then to papyrus scrolls. By 100ad the codex had arrived, but it was not until the ninth century that the first real paper book was produced. In Europe, paper was rare until after Gutenbergs breakthrough. It took a few more centuries for e-books to emerge. They were first envisioned in 1945 by Vannevar Bush, director of the United States Office of Scientific Research and Development. In his classic essay, "As We May Think", Bush described a gadget he called a "memex" -- "a device in which an individual stores all his books, records, and communications..."

Most of the memex contents are purchased on microfilm ready for insertion. Books of all sorts, pictures, current periodicals, newspapers, are thus obtained and dropped into place... Wholly new forms of encyclopedias will appear, ready-made with a mesh of associative trails running through them..." Although science-fiction writers eagerly adopted Bush's ideas notably on the television show "Star Trek", where portable electronic books featured regularly the real world has remained loyal to paper. Only in the encyclopedia market, which was transformed by cd-roms in the mid-1980s, has the e-book made real progress. Far more encyclopedias, from Microsoft's Encarta to Encyclopedia Britannica, are sold on cd-rom than were ever sold on paper, because they cost a fraction of the price and are easier to search. But attempts to broaden the appeal of e-book technology to "ludic" (or pleasure) readers have been unsuccessful. Since the late 1980s the electronic publishing world has seen several failed e-book ventures. Why? Most of them used devices that were either too bulky to carry around, or forced users to "stock up" their electronic library in inconvenient ways. (One required visits to a "book bank", an atm-like machine that was to be located in bookstores.) Before widespread adoption of the Internet, there was no universal way to download new reading material. But the most fundamental problem was the lack of a display technology that could compete with paper when it came to ludic reading. For paper books, readability depends on many factors: typeface and size, line length and spacing, page and margin size, and the colour of print and paper. But for e-books there are even more factors, including

resolution, flicker, luminance, contrast and glare. Most typefaces were not designed for screens and, thanks to a limited number of pixels, are just fuzzy reproductions of the originals. The result is that reading on-screen is hard on the eyes and takes a lot more effort. People do it only for short documents. The longer the read, the more irritating and distracting are all the faults in display, layout and rendering. Most of these problems are now being solved. The World Wide Web offers an amazingly flexible way to deliver books in bits and as investments in broadband infrastructure increase, it will get even easier to stock an e-library. And dozens of companies including e-book pioneers and established publishing firms such as R.R. Donnelly, Penguin Putnam, Nokia, Barnes & Noble and Microsoft have joined to create an open e-book standard, so that book-lovers will be able to read any title on any e-book. There have also been some incredible technological breakthroughs that will make it much easier to read long texts on a screen. Microsoft has developed a font display technology called ClearType that, by manipulating the red, green and blue sub-pixels that make up the pixels on an LCD screen, improves resolution by up to a factor of three. Coupled with the latest e-book reading software and hardware, this provides an on-screen reading experience that begins to rival paper. But why would anyone prefer an e-book to a p-book, regardless of improved readability? Because e-books have many other advantages. You will get instant delivery from your web bookshop to your e-book, and be able to store hundreds of novels on a device the size of a paperback. E-book technology enables you

to have an entire library in your pocket. Or you can keep it on your pca modern laptop can hold more than 30,000 books. You wont have to wait for out-of-stock books to be ordered, and books will never go out of "print" . Your children will be able to listen to unfamiliar words pronounced for them as they read. You will have unabridged audio synchronised to the text, so you can continue the story in situations where you are unable to readfor example, while driving. In addition, e-books promise to revolutionise the way the world reads. Whereas paper books are stand-alone entities, e-books can include hypertext links to additional content, whether it is in other books, databases or web sites. So e-books will not be restricted to a linear structure that is the same for everyoneevery reader will be free to make use of the links, images and sounds differently. You will also be able to customise e-books by adding your own notes, links and images. In a paper book, content is fixed. with e-book technology it is flexible. Finally, you will be able to get sound and moving images to support the text, creating an entirely new multi-medium. The e-book will also revolutionise the economics of the industry. The cost of publishing books will fall dramatically, the result of savings on materials, labour, manufacturing and distribution. In the process, a lot of trees will also be saved and even the most obscure author will be able to self-publish, which means more choice for readers. The retail price of books will fall. sales will explode. It is hard to imagine today, but one of the greatest contributions of e-books may eventually be in improving literacy and education in less-developed countries. Today people in poor

countries cannot afford to buy books and rarely have access to a library. But in a few years, as the cost of hardware continues to decline, it will be possible to set up "virtual" public libraries which will have access to the same content as the Library of Congress. 100Test  
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