Gutenberg and the Digital Revolution: Will Printed Books Disappear?

By Soon-Yong Choi  
The Center for Research in Electronic Commerce, The University of Texas at Austin  
Email: soon@mail.utexas.edu  

Dale O. Stahl  
Department of Economics, The University of Texas at Austin  
Email: stahl@eco.utexas.edu  

and Andrew B. Whinston  
Departments of MSIS, Economics and Computer Science, The University of Texas at Austin  
Email: abw@uts.cc.utexas.edu

Choi, Stahl and Whinston are co-authors of the book "The Economics of Electronic Commerce" (Macmillan Technical Publishing 1997) which discusses the economics of the digital marketplace and policy options in more detail. The authors are affiliated with the Center for Research in Electronic Commerce at the University of Texas at Austin.  
URL: http://cism.bus.utexas.edu

Abstract:

Novels, textbooks and even computer manuals will not be sold or read as CDs. Printed newspapers and magazines are much easier to read and handle than online versions. What, then, is the effect of the digital revolution? We argue that printed books will soon disappear as the mode of information exchange and consumption, not because the digitization offers a better economics of production but because knowledge-based products must come ready to be integrated with smart products and digitized communication. Books, novels and newspapers were products of the Gutenberg Revolution. Likewise, new forms of knowledge dissemination and usage will evolve with the digital revolution, and thus draw the curtain on printed books.

Many information traders, publishers and content owners consider the Internet as a new media market to sell digitized versions of existing contents. Some foresee no end for the old-fashioned publishing business. Publishers point out that even the most savvy technology users seem to prefer books over online manuals. Will printed books persist? What effects will the so-called digital revolution have on the way we produce and exchange knowledge-based products? By discussing the case of printed versus digital books, we would like to answer a few questions regarding the nature and implications of the digital revolution and the coming digital economy.

Printing Technology and the Mode of Information Exchange

In 1450, technologies developed over the previous thousand years were combined to produce a revolutionary new process of printing. Integrating paper invented by Chinese, movable type first experimented by Koreans, and oil-based ink developed by Italian painters, Gutenberg's printing press supplanted laborious hand copying with mass production. A similar revolutionary change is in the works: the digital revolution. Computer-aided desktop publishing and digitization processes have finally replaced paper and printing press with computers and the Internet as the modus operandi for information exchange. However, neither the printing press nor any computer technology by itself causes revolutionary changes. But the process enabled by new technologies will change the way we use information and make printed books obsolete.

Both the printing press and the digitization have similar effects on the economics of information: reducing production costs and making knowledge (and entertainment) more accessible. It is a small step to convert novels and magazines
into digital format. But publishers note that CDs or online books are poor substitutes for printed versions, and will have difficulties being accepted by reading public.

However, what the Gutenberg revolution brought was not simply an improvement in printing process. Lowering costs and increased availability of books had contributed to rising literacy, civic and political participation, and dissemination of news and ideas. Daily newspapers and magazines were made possible by the printing technology and they in turn opened new business opportunities and processes of information exchange and consumption. In short, changes in production technology will ultimately affect the way we consume the end products, whose format will change in order to maximize the benefits of consumption.

We often take it for granted that knowledge is conveyed through printed books, but books as a form of knowledge exchange and consumption were a result of the printing technology. Printed books have not only established writing as the norm but also changed the way stories were told: from epic verses suitable for reciting to novels that were as inviting as couch seats or window sills. Even the novel as a literary genre was an invention of the 19th century. Before printed books were available cheaply, storytelling consisted of plays enacted in public markets or singing and acting by traveling troubadours-more of an oral and performance tradition.

With a new production technology, a new mode of consumption will evolve. Simply replacing printing presses with digital CD stamping machines will not change the way novels are written and read. With the new digital technology, a novel may not be the preferred form of entertainment or reading a story. In that sense, printed books will disappear, but how will those new forms look like?

**Digital Products in the Digital Age**

Today's information usage has shown why computer-assisted consumption is superior. Reference CDs-dictionaries, encyclopedia, directories, databases, clip art and other collections-have proliferated simply because CDs offer better methods of searching, indexing, clipping and cross-referencing, a lesson well learned by Encyclopedia Britannica. The benefits afforded to consumers plainly favor reference CDs over printed books as a form of information usage.

What about non-reference books like novels? Surely, it is not advised to read a novel online, scrolling and squinting. Any material that we normally endeavor to read cover to cover seems to be ill suited for digitization. In fact, more books than CD copies are sold even for subjects in computer, the Internet and electronic commerce. Does this mean that the desktop publishing revolution is not a revolution at all but limited to nifty reference CDs?

As we pointed out earlier, printing and reading a book has been the mode of information consumption within the context of printing technology. The digital age will again change the way stories are told. Instead of reading a novel, it may involve participation in an interactive story or in a holodeck exercise envisioned in sci-fi movies. Storybook-like computer games already give us a glimpse into the future.

Knowledge-based products will come ready to interact with smart products and to process our commands with built-in interfaces and software-an integrated knowledge product, not a printed book. Consider the popular form of information exchange: faxing. Faxes are well suited for many business purposes, and some still consider emailing inferior to faxing just as books are preferred to CD versions. The ease of using a fax machine and the availability may explain its continued popularity. But when you want to input faxed text into a word processor, scanning and OCR will be too cumbersome and inefficient, while a file sent over the Internet has all the advantages of a fax. The superiority of digital medium comes from the way it allows diverse, productive and innovative uses, many of which remain to be invented. The digital process will not only change existing products but also introduce new products and processes. Printed books, by the lack of integration into new ways of doing things, will become scarce.

Will books disappear? Certainly not. If one wants to read a good story lying on a couch, a printed book will still be the best choice even in the 21st century. But if you want to solve software problem, an integrated software manual which will send an applet to diagnose and correct the problem will be better. This need-based application of knowledge is better supported by digital products. The significance of digital revolution is in its ability to enable new processes of consuming information.
In the mid-15th century Italy, a classical text could be produced by a scribe at one florin; it would cost more than three florins utilizing a press. If one needs only a single copy as was the case for wealthy merchants building a private library, it would make sense to use a scribe instead of Mr. Gutenberg's printing service. However, new possibilities (e.g. lower marginal cost for multiple copies, standardized and readable typefaces, lower number of mistakes, etc.) soon launched the publishing industry and commissioning personal copies disappeared. Novels, daily newspapers and magazines, well-suited for the printing technology, proliferated as new forms of information exchange.

In the digital age, integrated knowledge products will again change the publishing industry along with the way we use knowledge. Printed books and newspapers simply cannot be integrated smoothly as digital versions could. With the digital revolution, the vast human knowledge stored in libraries will be at our finger tips, just as good as if we had read it all. This does not mean we can stop reading; only we will be reading a different sort of knowledge-based products.