

# THE END OF PAPER?

Someday you may be reading your newspaper (and this magazine) on an e-paper device—a thin piece of plastic the size of a legal pad that can be taken to the beach or on the train. That day may be a lot closer than you think.

By *Michael V. Copeland*

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**EVER PICK A FIGHT** with someone who buys ink by the barrel. Mark Twain's advice was apt in its time but sounds downright quaint these days. The ink-stained publishing world is battling against companies like Google and Yahoo that sell ads via any Internet-friendly gadget. And we know how that fight is going: The buy-ink-by-the-barrel types are struggling.

A man with dark hair and glasses, wearing a dark suit jacket over a white shirt, is looking upwards and to the right. He is holding a curved, blue, translucent plastic sheet with both hands. The sheet is curved like a shallow bowl. The background is a plain, light-colored wall.

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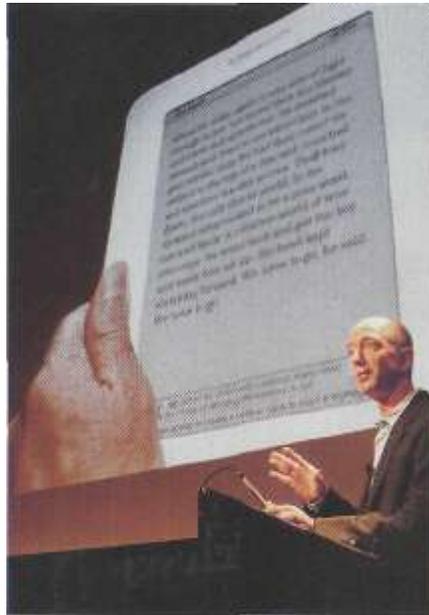
**PAPERLESS BOOKS** AMAZON'S JEFF BEZOS HAS SOLD A HALF-MILLION KINDLES SINCE THE ONLINE RETAILER LAUNCHED IT IN 2007.

Behind all the handwringing is the fact that the Internet has not yet become the moneymaker that the \$300 billion global publishing industry had hoped. Online revenue is growing, but not fast enough to make up for falling print advertising. Even the *New York Times*, a paper that has turned its staff loose online more than most, needed a recent \$250 million cash infusion from Mexican telecom billionaire Carlos Slim to keep chugging along.

So if the Internet can't do it, what can save the *New York Times* or your favorite magazine from withering away? Increasingly, publishers like News Corp., Hearst, and Time Inc. (the owner of Fortune) are looking toward a coming generation of so-called e-readers. These are handheld gadgets akin to Amazon's Kindle or the Sony Reader that use electronic "ink" rendered on a crisp screen to deliver an experience that approximates reading on paper—without the cost of paper, printing, and delivery. Today the Kindle and the Sony Reader are mostly suited to books because their six-inch-diagonal, black-and-white displays simply don't provide a good enough reading experience and advertising environment for magazines and newspapers. But at least a half-dozen companies, including giants like Hewlett-Packard and Fujitsu and startups such as Polymer Vision, FirstPaper, and Plastic Logic, are developing a new crop of readers, some of which will start hitting the market later this year. Designed with the requirements of newspapers and magazines in mind, they will feature larger screens (to make it easier to navigate through stories), wireless updating (something the Kindle has made a requirement), better image resolution, and eventually color and video.

These gadgets could be pulled straight out of the Tom Cruise movie *Minority Report*. Imagine wirelessly downloading an issue of your favorite magazine onto an 8- by 11-inch plastic screen that is light and durable enough to throw into your briefcase, to take to the beach, or to read in your easy chair on a Sunday morning. The resolution of each page is as clear as what you find in today's magazines, and the photographs appear in striking color. Flip the page with a touch of your finger, and an ad for, say, BMW appears. Touch the image of that navy-blue 3 Series, and a video shows the car slicing through the hills of Bavaria.

"It all sounds very sci-fi," says Kenneth Bronfin, who heads up the interactive-media group for Hearst, which publishes newspapers like the San Francisco Chronicle and magazines like Esquire,



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"but the technology, with the exception of video, is readily available." When asked whether Hearst publications will appear on it, Bronfin is coy: "I can't tell you the details." Industry insiders say Hearst is close to launching a wireless e-reader with a large screen tailored to the newspaper and magazine industry. Publishers will be able to brand the Hearst devices themselves and configure its look and feel, as well as how the content is sold to subscribers.

**THE TECHNOLOGY**, for the most part, works. The question is, Will the business model? So far the math looks somewhat promising. Citigroup analyst Mark Mahaney estimates that since Amazon launched the Kindle in 2007, it has sold 500,000 at \$399 a pop (now \$359)—roughly a \$200 million business. The machine sold out during the holiday season. Sales of Amazon's e-books—you can download onto your Kindle the novel Edgar Savtfele for \$9.99, vs. \$15.57 for the hardcover version—are soaring. Amazon won't reveal any figures, but book publishers say sales of e-books, albeit from a small base, quadrupled in 2008. "We knew we couldn't out-book the book," says Steve Kessel, senior VP for worldwide digital media at Amazon. "We needed to do things that books couldn't do. We have 30 [wireless], which allows you to look up a word or go directly from a passage to Wikipedia."

The Kindle might be the salvation of books, but magazines and newspapers have a different business model. They rely on revenue from reader subscriptions and from advertising, and those trends are not encouraging. The industry's contraction is happening at a time when paper prices are high and postal costs are rising. E-readers could dramatically reduce those costs. Buying paper and ink, printing, and delivering a newspaper or magazine can account for more than 50% of the overall cost of producing the periodical. E-readers also turn out to be good for the environment—fewer trees are cut down to make paper.

Can publishers abandon paper and still keep a big chunk of the subscription and advertising money? That won't be easy. No one yet has figured out the perfect business model. Under one scenario publishers would license their content to an e-reader seller, such as Plastic Logic or Amazon, or to a wireless provider like AT&T or Verizon Wireless. These companies would sell and manage the wireless e-readers and offer customers bundles of content the way a cable company does. You could buy subscrip-

tions to individual magazines and newspapers or bundles of content on entertainment, sports, or business—or both. Verizon Wireless is making a big push to open its network to e-readers, says Anthony Lewis, vice president for Verizon Wireless Open Development Business. "I want to see all kinds of e-readers on my network, and you are going to see it happen sooner rather than later," Lewis says. "How the partnerships with device makers and content providers are designed remains to be seen."

What most publishers wouldn't want to see is someone else controlling their content. When News Corp.'s 20th Century Fox wanted to sell its movies on iTunes, Apple demanded the lion's share of the revenues. After a long string of heated negotiations, Fox finally won a share of the proceeds it could live with. Rupert Murdoch is looking hard at e-readers. He has always believed that the role of the media is to get consumers their newspapers and magazines conveniently, on as many platforms as possible. Today that means News Corp. may have to get into the e-reader business, both on the hardware and software side. That raises some thorny issues. When the next generation of e-readers first

hit the market, they will cost as much as \$800. Will a customer be willing to buy a device that could download only the *Wall Street Journal*, the *New York Post*, and other News Corp. properties? Probably not. That means any print publisher that gets into the e-reader distribution game will have to offer an open system in which you can download any magazine or newspaper. A publisher that wants to control distribution will need to sign licenses with competitors that in all likelihood would rather be offering their own e-reader catalogs. Prepare for a battle royal.

**ANOTHER WRINKLE IS THAT** most readers are used to getting their content free on the web. Persuading them to pay for what they now get free will be a tough sell. Precedents do exist. The *Wall Street Journal*, the *Financial Times*, Zगत, and Consumer Reports charge readers an annual subscription fee for most of the content on their websites. Online traffic at the *Wall Street Journal*, which charges \$103 a year, is almost half that of the *New York Times* (about six million unique visitors a month, vs. 14 million, according to Compete, corn). But the *Journal* last year raked in \$100 million in online-subscription revenue, which suggests that if the material is compelling enough, publications could charge for subscriptions on an e-reader.

Some experts believe that readers will pay by the article. "Citibank Finally Posts a Profit" might cost you 10 cents. The technology exists for micropayments. Trouble is, except for iTunes, consumers have shown little inclination to use micropayments when it comes to content. As more and more high-quality articles are protected behind Internet walls, people are likely to subscribe to magazines and newspapers on these devices just as they buy books.

If subscribers do come flocking, advertising will follow, but only if publishers provide Madison Avenue with an environment where their ads look great. Keeping the feel of a magazine or newspaper is what e-reader makers like Plastic Logic hope to give publishers. "Our device is the size of a magazine, so it offers a way to maintain all the layout, the images, and the design—and all the advertising—that are a part of that publication's brand," says Plastic Logic CEO Richard Archuleta.

Some publishers worry that the advertising model won't work. The fear is that they will find themselves in the same predicament they're in today with online, where ad rates are dramatically cheaper than print. Why should an advertiser pay more for an article on an e-reader than on a website? After all, they're both electronic media. Another problem: Print magazines are usually handed on to other readers, and publishers get paid for those extra eyeballs. True, an e-reader subscriber

# MOVE OVER, GUTENBERG!

Forget the printing press. Soon we will be reading our newspapers and magazines in color, on light, flexible pieces of plastic. So far startup **E INK** leads the field. Here's how its technology works.

**START WITH BLACK AND WHITE**  
An electric charge rotates hundreds of black and white particles floating inside microcapsules. When the white particles move to the surface, they reflect light and help form a letter on the screen. Hundreds of thousands of microcapsules, each about half the width of a human hair, are needed to form each letter.

**THEN ADD COLOR**  
To generate, say, the color blue, the electric charge turns the microcapsules white. They then reflect light through the blue sections of a color filter embedded on the screen of the e-reader.

The diagram illustrates the E Ink technology process. At the top, a color filter is shown with sections of blue, red, and green. Below it, a layer of microcapsules is shown, each containing black and white particles. An arrow indicates that an electric charge causes these particles to rotate. The white particles move to the surface of the microcapsules, reflecting light. This process is used to form a letter 'R' on the screen of a color E Ink reader. A label points to 'One blue pixel' on the screen.

isn't likely to hand around an \$800 device at the office, but it is conceivable that he could share a downloaded article with others at home or e-mail it to a few friends.

So will print publications be trading yesterday's dollars for dimes? E-reader fans argue that the environment will be so attractive (imagine color video ads in HD) that advertisers will be willing to pay considerably more than they do for online ads, especially if they appear in a publication the reader has paid for. Plus, people tend to be more engaged in an offline reading experience (as they are in magazines). A publisher will be able to prove that to an advertiser by tracking who has looked at an ad and for how long. Even if e-reader ad rates end up being less than those for print, the amount saved in paper and delivery costs might make up much of the difference.

That said, attracting meaningful ad dollars won't happen overnight, says David Smith, CEO of the San Francisco media-buying and digital-advertising company Mediasmith. "Until e-readers get popular enough where they have reached some critical mass, other forms of media are first in line, like mobile," Smith says. "I have no doubt advertising will happen on these devices, but it is not going to be this year or next." To reach that critical mass, e-readers will need to drop dramatically in price. The magic pricetag, according to research by the Reynolds Journalism Institute at the University of Missouri, is in the neighborhood of \$200—but that's a far cry from the \$800 often quoted for the next generation of e-readers. One tactic would be for publishers to subsidize the cost of the readers in the same way that U.S. cellphone companies subsidize the cost of handsets.

The other hurdle e-readers face is gadget fatigue. Some people are already reading newspapers and books on their iPhones. Are they really going to add yet another device to the jumble in their bag? Different gadgets will suffice for different situations, says Steve Haber, president of Sony's digital-reading business. "We heard this when camera-phones came out—people have them 24 hours a day, why would they need a separate camera? Well, you use the camera in your phone when you have to, but when you want to take real pictures, you get out your point-and-shoot. When you want to get the ultimate reading experience, you will get out your e-reader."

**ON A SUNNY WINTER DAY** at Plastic Logic's Mountain View, Calif., headquarters, CEO Archuleta pulls out an 8- by n-inch white plastic sheet about an eighth-inch thick. He touches a button in the upper left corner, and a menu appears listing documents, spreadsheets, newspapers, and magazines. Less than a pound in weight, the Plastic Logic reader, which the company says it will start selling early next year, has the feel of a clipboard. A slim lithium ion battery powers it for several days' worth of reading on a single charge. Like the Kindle, the Plastic Logic reader permits uploading documents from a PC. What Plastic Logic has done, after years of research and some \$200 million in funding from Dow, BASF, and others, is to create transistors

from plastic that can do the work of ones made from, silicon, but without brittle glass substrates. One advantage of plastic transistors is that they're cheap to make. They are "printed," rather than etched in multibillion-dollar chip fabs. They also happen to be tough. Plastic Logic's screen, while not floppy or foldable like a piece of paper, can be stomped on without breaking. But flexible display technology may not be far behind. Besides Plastic Logic, such other players as HP, LG Display, and Polymer Vision are developing their own brews of flexible substrates that will allow you to fold up your screen and slip it into your pocket.

Most e-readers would not exist if it weren't for E Ink, a Cambridge, Mass., startup, which has raised \$150 million from investors like Intel and Hearst. Its technology makes possible the black-and-white text and images in the Plastic Logic reader and just about every other reader on the market, including the Kindle and the Sony Reader. CEO Russell Wilcox and his colleagues originally

developed the technology at MIT. (See graphic, "Move Over, Gutenberg!" for the way it works.) According to Wilcox, a color screen is at least two years away, but the work in E Ink's labs looks promising. It is adding color filters to the capsules. The trouble with filters is that they reduce the resolution of the screen, making the color appear washed out. Beyond color is video, something E Ink has shown to work in the lab, but which is still years away. One problem: Video eats up battery life rapidly.

In the meantime, competing display technologies could get there first. For example, LCD technology—used in today's flat-screen TVs and in PCs—has

a massive manufacturing infrastructure behind it. Once power consumption and readability issues are solved, it could mean a quick dip in prices for these displays. Pixel Qi, a startup in San Bruno, Calif., headed up by Mary Lou Jepsen, former CTO of the nonprofit One Laptop Per Child, expect?to start shipping ten-inch-diagonal color LCD screens for e-readers this summer with video and long battery life. "Once you get to low-power color and video, you can make these devices much more visually compelling, and that is fundamental to the ultimate mass-market appeal," says David Yoffie, a professor at Harvard Business School, and a former board member at E Ink. "Without it, you fail."

E Ink's Wilcox has anything but failure in mind. He believes that e-readers are the best chance to keep the world devouring novels, lengthy nonfiction tomes, and long-form journalism. "We can't have meaningful discussions or try to solve the world's problems using blogs and 140-character Tweets," Wilcox says. "What we need more is calm, prudent thought—more expertise." That is what Wilcox hopes to deliver with E Ink. "We're not only going to save publishing," he says, "we're also going to save civilization." The laugh that you might expect to come next never does. He means it. Q

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