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Fidler, Roger F

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The Emergence Of Digital Print Media

By

Roger F Fidler

The Emergence of Digital "Print" Media

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Numerous attempts have been made to create electronic alternatives to the printed newspaper since the mid 1970s. Nearly all have proceeded on the premise that the video-based television, which was originally developed to display moving images, is inherently superior to the much older document, which, in its many forms, provides the underlying technology for print media and written communications.

So far, however, none of the attempts to force print media into the television has succeeded as a commercial enterprise anywhere in the world. I do not mean to imply by this that newspapers are secure in their present form or that they are somehow immune to terminal afflictions, but, to paraphrase Mark Twain, reports of their impending death are greatly exaggerated.

This is not the first time pundits have predicted the death of newspapers. The rapid diffusion of commercial radio in the 1930s and 1940s, and television in the 1950s and 1960s, led many people to believe the end of newspapers was at hand, but in each instance the newspaper business adapted and proved to be much more resilient than expected. While the total number of newspapers in most countries has been declining steadily since its peak in the first two decades of this century, every city and nearly every small town is still served by at least one local newspaper. Even with troubling

declines in readership and stiff competition from other forms of mass media, the newspaper business as a whole continues to be one of the world's most successful and profitable enterprises.

Admittedly, the concept of individually tailored information delivered electronically on demand has great appeal. However, to assume that personal information retrieval services or interactive television news will one day replace newspapers edited and packaged by professional journalists is to confuse their distinctly different roles. This assumption also underestimates the adaptability of newspapers and their importance in contemporary societies. Newspapers and the printed word have become so integral to our institutional structures that it is difficult to imagine how modern governments, businesses and social systems would function without them.

Far from dying in the next century, newspapers actually are well positioned to emerge stronger than ever. Despite the enormous challenges they are now facing, newspapers could even regain their position in society as the predominant form of news and information media. But to do so, they cannot remain as they are. Social, economic and environmental pressures are already forcing newspaper executives to rethink the nature of the business and to consider alternative publishing opportunities.

For newspapers, the process of mediamorphosis began in the late 1960s with the introduction of the first computerized typesetting systems. Since then, newspapers have been

rapidly converting their labor-intensive Industrial Age technologies to digital systems. Today, journalists gather, write and edit stories on word-processing computers linked to high-speed networks, photographers process their photos on digital imaging systems, artists create graphics and advertisements on microcomputers, designers compose complete pages on sophisticated layout systems. In fact, practically everything contained in most newspapers has been converted to a digital form.

While this phase of mediamorphosis has profoundly affected the lives of people who work for newspapers, nearly all of these changes have gone largely unnoticed by readers. Newspapers continue to arrive as they always have on the schedules set by publishers. The printing may be crisper and more colorful, but the ink still rubs off on your fingers. The content may be better written and better packaged, but it remains a day-old slice of time.

All that is about to change, but not in the way most media experts have been predicting.

There can be no doubt that before the end of this decade the microcosmic forces of digital technology will launch an all-out assault against the last bastions of Industrial Age publishing — printing presses and delivery trucks. Sometime within the first decade of the new millennium, the historic barriers will be breached, and pigmented ink printed on pulp paper will finally begin to give way to digital ink displayed on silicon paper. However, contrary to popular wisdom, I do

not believe future digital newspapers will be read on television screens or computer monitors.

If newspapers are to succeed in digital form, they will require underlying technologies quite different from the conventional video-based models. To be competitive with other forms of media, digital print media must combine the interactivity of personal computers and the compelling qualities of television without sacrificing the readability and ease of using paper. As with traditional print media, they must be comfortable and convenient to use while lying in bed, riding on a subway, dining in a restaurant, or sitting on a park bench.

The technologies that could meet these requirements are not, as some believe, far in the future. They are here today.

What is generally being overlooked by those pursuing new forms of media for the information superhighway is the emergence of an electronic display medium with the power to extend, as well as greatly enhance newspapers and other forms of print media – the intelligent flat-panel display.

For decades, flat panels have been regarded as the successors to the bulky cathode ray tubes used for television screens and computer monitors. These thin, light-weight displays are what made laptop computers possible. But the flat panel soon will be much more than merely a display for a portable computer. It will BE the computer.

Just as the solid-state transistor transformed electronics in the 1950s and 1960s, the intelligent flat panel has

the capacity to transform human communications, and with its most forms of mass media. The merging of memory devices, microcomputer processors, and wireless communications with flat-panel displays has already begun to create a new class of intimate computers called "Portable Information Appliances," or "PIAs."

PIAs are not personal computers as IBM defined them in the 1980s. Rather than tools for creating and revising documents, they are primarily tools for viewing and interacting with documents: more like paper than contemporary personal computers. In a very real sense, these flat-panel devices are destined to become the ultimate recyclable information medium.

PIAs will take many forms. Some will be small enough to fit in coat pockets and will serve as organizers, notepads, calendars, travel guides and communicators. Others, with the dimensions of a standard portfolio or magazine, will function as interactive viewers for all sorts of documents from letters and reports to newspapers and books.

Instead of keyboards, most will use electronic pens for interacting with content and will be capable of accurately recognizing handwriting and voice commands. Interchangeable, solid-state memory devices the size and shape of credit cards will replace mechanical disk drives and have a capacity to store complete mixed-media publications. Built-in wireless communications will make it possible to conveniently and easily receive up-to-the-minute information and personal

electronic mail, as well as place orders and make reservations.

Portable information appliances will have a vast number of practical uses early in the twenty-first century beyond displaying digital editions of newspapers, magazines and books. They will be used by factory workers as electronic clipboards and manuals, by executives for viewing and distributing memos and reports, by salespersons for presentations and order entry, by attorneys to interact with depositions and documents in court, by repair persons and installers to access up-to-the-minute schematics and animated instructions, by public speakers as prompters and notepads, by stock brokers and commodities traders to process orders, by students and teachers to access current editions of interactive textbooks and course materials, and in nearly every other situation where paper is used today for storing, displaying, capturing and distributing information that requires frequent updating or is of an ephemeral nature.

One of the first examples of this new medium, the pocket-sized Newton, was introduced by Apple Computers, Inc. in the fall of 1993. Several other companies have followed with comparable PIAs, which Apple refers to as personal digital assistants or, more commonly, as PDAs.

Even though Apple sold more than 50,000 units within the first few months of introduction, the Newton and most of its competitors have been widely disparaged by media and technology critics for their high cost, bulkiness and poor handwriting recognition. But such criticisms of new elec-

tronic devices are not uncommon. The first pocket calculators and personal computers suffered similar attacks in the 1970s, yet still went on to become successful products. When the price and weight of pocket-sized PIAs are reduced and they include built-in wireless communication, I have no doubt they will find many useful and profitable niche applications.

Several computer and consumer electronic companies, including Apple, have announced plans to introduce larger, intermediate-sized PIAs in early 1995 based on the popular laptop computer screens. While it may be possible to adapt some printed publications to these devices, the screens still will be too small and coarse for easy reading. Moreover, most manufacturers see these intermediate units merely as extensions of personal computers rather than as a new class of information appliances.

To serve as an alternative to ink and paper for newspapers, still larger displays with greater clarity and contrast will be required. Because the vast majority of documents - letters, reports, journals, magazines, etc. - conform to the American 8 1/2" x 11" or European A4 standards, equivalent dimensions need to be adopted for the next generation of portable information appliances. Most industry experts believe tablet-sized PIAs will emerge well before the end of this decade. Even though most printed newspapers are significantly larger, the tablet size should not pose a serious problem for publishers.

By the end of this decade or early in the next, lightweight, tablet-sized PIAs employing more appropriate flat-

panel technologies should begin to blend the best attributes of paper and video. Advanced flat panels with the clarity and contrast of ink on paper are already being developed at laboratories around the world. With these advanced tablet PIAs, it will be possible to fully transform newspapers into a digital, mixed medium.

Instead of completely discarding 500 years of accumulated printing and publishing knowledge, and 300 years of newspaper experience, digital "print" media developed for tablet PIAs could lead to a new Renaissance in typographic and visual communication. In the next phase of mediamorphosis, newspapers, and most other forms of print media, will be able to merge the written word and still images with full-motion video and sound in engaging and aesthetically pleasing formats. Moreover, unlike the rather sterile presentations of today's on-line computer news services, electronic publications designed for this new document-based digital medium will be able to retain their familiar print characteristics and identities.

Electronic editions in this form could be made more personal and interactive without eliminating the judgments and creativity of professional editors and designers. With the ability to integrate moving images, sound and text, newspapers should be able to provide greater depth and a more interesting and complete perspective on the day's events without overwhelming readers or requiring them to spend more time. These mixed-media newspapers also should be able to offer advertisers a more focused, compelling and trans-

actional environment in which to market their products and services.

As with all new consumer electronic products, such as televisions, VCRs and digital fax machines, the introductory cost of tablet-sized PIAs will be high, probably somewhere between \$1,500 and \$2,500. While that would be too expensive for the general consumer market, the cost is not likely to deter early adopters in business and professional arenas.

When these devices can make viewing and interacting with reports, contracts, sales materials, forms, personal correspondence and other common documents almost as effortless as ink on paper, they are certain to find a large market. For most business and professional people, the ability to more conveniently carry, organize and update the stacks of routine documents that inundate them every day would be sufficient justification for purchasing tablet PIAs.

Publishers should not have to invent or sell PIAs to their customers. PIAs are likely to emerge and diffuse into the general consumer market on their own as they become more useful and affordable. Newspapers may not drive the early market for tablet PIAs, but they are certain to be major providers of packaged news and information right from the beginning. Magazine and book publishers are also likely to find a ready audience for digital editions.

If tablet PIAs follow a diffusion pattern similar to that of other successful consumer electronics products, they could be as common as VCRs and personal computers are today within ten years of introduction. Early in the next decade,

the low-end retail price of these devices could be well under \$500. Of course, more expensive models will also be available just as they are with televisions and computers.

No one expects printing presses and paper to disappear entirely in the next century, but they are certain to be used quite differently and much more sparingly than they are today. The shift from ink and paper to digital media will not be sudden, as some people seem to believe. Initially, electronic editions designed for tablet-sized appliances will complement printed editions. However, for most publishers of newspapers, magazines, and other ephemeral printed products, the superior economics and attributes of digital ink and silicon paper will ultimately make total conversion to this form of publishing irresistible.

If tablet PIAs are the digital alternatives to printing presses and paper, then the information superhighways will be the alternative to delivery trucks and carriers. With so many telecommunication companies competing to build and link high-speed networks to meet the anticipated consumer demand for video and computer services, the cost of delivering mixed-media newspapers to homes and offices in the next decade should be significantly less than it is today for printed newspapers.

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me•di•a•mor•pho•sis *n.* The transformation of a communication medium from one form to another usually brought about by cultural changes or the introduction of new technologies.

(Note: I coined the word "mediamorphosis" in 1990 to serve as the title for my forthcoming book.)