EDSf REPORT
LEADING RESEARCH FOR THE DOCUMENT COMMUNICATION INDUSTRY
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Predicting the future

Science fiction authors from Jules Verne to George Orwell to Arthur C. Clark have predicted many futures—but none predicted the Internet. In 1863 Jules Verne wrote about Paris in the Twentieth Century. His publisher told him his vision was too dismal and rejected the manuscript. In 1989 his great-grandson Jean Verne found the novel in the publisher's safe, and it was published in 1994.

Verne's Paris-of-the-future was an extrapolation of social trends already evident during Verne's own time—laissez-faire capitalism and rapid technological growth. As he saw it, by 1960 Paris had evolved into a high-tech commercial megalopolis where gasoline-powered cars crowded the streets and polluted the air, while commuters were transported in pneumatic tube-trains suspended from above. Electricity illuminated the city and ubiquitous commercial advertising. Computer-like calculators and fax-like communication devices linked the city, financial markets, and the world. Multinational corporations held the real political power and tactical military weapons were so perfected that the very idea of war was no longer thinkable. But, this was no utopia; most forms of art, literature, and music had disappeared, or been redirected toward utilitarian purposes. Education was standardized for all.

The two major futuristic novels of the 20th century were George Orwell's 1984 and Aldous Huxley's Brave New World. Huxley saw a world in which no one would want to read books; all work was done by robots, and the populace was controlled with pleasure—and truth lost in a sea of irrelevance. Orwell saw a world that would ban all books; information would be controlled in a captive culture with very little "free" information; truth was concealed; and people were controlled with pain.

A non-fiction prediction by Vannevar Bush of MIT appeared in 1945 in an "As We May Think" article in Atlantic Monthly. Bush's piece was written at the end of World War II, which science had played a significant role in winning, and Bush wondered where scientists would turn their attention next. He began by noting that there was a growing mountain of research, but that a single researcher could not hope to keep up with it all.

Vannevar Bush was an educator and visionary, who met with President Roosevelt in 1940 and detailed his plan for mobilizing military research. He proposed an organization that would bring together government, military, business, and scientific leaders to coordinate military research. Bush was made Director of the Office of Scientific Research and Development, responsible for the 6,000 scientists involved in the war effort. Bush proved that technology was key to winning a war, and this created a new respect for scientists. He institutionalized the relationship that was responsible for the architecture of government support for science, and this element helped foster the creation of the Internet.

Bush is the godfather of our wired age. In his article, Bush described a theoretical machine he called a Memex which enhanced human memory by allowing the user to store and retrieve documents by associative linking—known today as hypertext. The Memex was a storage and retrieval device using microfilm. It consisted of a desk with viewing screens, a keyboard, selection buttons and levers, and microfilm storage. Information stored on the microfilm could be retrieved rapidly and projected on a screen.

Scientist Ted Nelson, who coined the term "hypertext" in the 1960s, acknowledges his debt to Bush. Bush died in 1974, years before the Internet or the World Wide Web even existed.

Bush's article also contained descriptions of devices rarely cited. These include the Cyclops Camera: "worn on forehead, it would photograph anything you see and want to record. Film would be developed at once by dry photography;" advances in microfilm; a thinking machine (a mathematical calculator); and a vocoder, "a machine which could type when talked to."

DID YOU HEAR?

- Despite their efforts, 42 percent of marketers were dissatisfied with ROI measurements. In 50 percent of companies, marketing and finance don't speak with one voice or share common metrics (Association of National Advertisers).
- A communications industry forecast predicts alternative advertising spending will increase more than 23 percent from 2006 to 2011, while traditional advertising will have a compound annual growth rate of just over one percent (Veronis Suhler Stevenson).
- Interactive marketing spending will more than triple over the next five years, reaching $61 billion by 2012 (Forrester Research).
- As companies have been automating or offshoring their production, manufacturing, or clerical activities, a growing proportion of the labor force is engaged primarily in work that involves negotiations and conversations, knowledge, judgment, and ad hoc collaboration—interactions. By 2015 employment in jobs primarily involving such interactions will account for about 44 percent of total U.S. employment, up from 40 percent today (McKinsey & Co.).
- Environmentally-friendly "Green IT" will be at the forefront of business strategies in 2008. Manufacturing, transportation, and IT equipment causes about two percent of the world's carbon emissions, on a par with the aviation industry (Gartner).
- U.S. laptop sales rose 21 percent in 2007 to 31.6 million, while desktop sales slumped 4 percent to 35 million. By 2011, portable computers will constitute 66 percent of all corporate PCs sold, up from 40 percent in 2006, and 71 percent of all consumer PCs sold, up from 44 percent (IDC).

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Editor-in-chief: FRANK J. ROMANO, EDP

Editors: Toby Cobrin, EDP; Roberta McKee, EDP; Brenda Kai; Sidney F. Huttner, Univ. of Iowa

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EDSF
The Electronic Document Systems Foundation

1845 Precinct Line Road,
Suite 212
Hurst, TX 76054
USA
+1 817-849-1145
info@edsf.org
www.edsf.org

SHORT TAKES: FACTS AND OPINIONS

Israeli scientists have inscribed the entire Hebrew text of the Jewish Bible onto a space less than half the size of a grain of sugar. The nanotechnology experts at the Technion Institute in Haifa say the book was etched on a surface that measures less than 0.01 square inch. They chose the Jewish Bible to highlight how vast quantities of information can be stored on minimum amounts of space. It took about an hour to etch the 300,000 words of the Bible onto a tiny silicon surface. The Technion's microscopic bible was created by blasting tiny particles called gallium ions at an object that then rebounded, causing an etching effect. When a particle beam is directed toward a point on the surface, the gold atoms bounce off and expose the silicon layer underneath just like a hammer and chisel. The technology will be used as a way to store vast amounts of data on biomolecules and DNA. The previous smallest known copy of the Bible measured 1.1 x 1.3 x 0.4 inches, weighed 0.4 ounces, and contained 1,514 pages.

I always carry a nano Bible in my pocket in case I am hit by a nano bullet.

ADMNews/Pitney Bowes Survey on Direct Mail and the Environment of 1,000 Americans across all age groups and in a variety of living environments (urban, suburban, rural) shows that they respond positively to relevant direct mail offers. But these people have a skewed view of the impact that direct mail has on the environment. One stark statistic is that 48 percent of respondents think that advertising mail accounts for more than half of the country's municipal waste. According to the Environmental Protection Agency, that figure is more like 2 percent of all waste—an answer chosen by just 2 percent of respondents.

What we really want is a junk mail filter.

The latest significant advertising forecast is from media agency ZenithOptimedia. Marketers will spend $195 billion on North American advertising next year—4.1 percent more than in 2007—while ad spending worldwide will near $486 billion in 2008 for a 6.7 percent gain. U.S. ad-spending growth this year will reach 2.5 percent, far below the 3.7 percent growth forecast last summer and well under 3.6 percent inflation. But that 6.7 percent growth for 2008 is not so significant when you consider three of advertising's most important catalysts are colliding this year: the U.S. presidential election, the Olympics, and a European soccer championship.

Easy solution to advertising revenue: lets have a U.S. presidential election, the Olympics, and a European soccer championship every year.

The *Cincinnati Post* published its final issues after 126 years of publishing. The front-page headline proclaimed "30," the number traditionally used by journalists and others to signal the end of an article. After the last *Post* was printed, its sister *Kentucky Post* marked the final run for both daily newspapers. The *Posts* had struggled for decades amid a national decline in afternoon newspapers and in multiple daily newspapers in U.S. cities. E.W. Scripps Co., based in Cincinnati, decided in July to close the Post newspapers. The Post newsroom was down to about 50 people at the end, and its daily circulation was less than a tenth of the 270,000-plus it enjoyed in 1960.

"30" means "the end"—and when circulation starts to approach 30, it really is the end.

Passport cards for Americans who travel to Canada, Mexico, Bermuda, and the Caribbean will be equipped with RFID technology that allows information on the card to be read from a distance—up to 20 feet away—in under two seconds. The card will not have to be physically swiped through a reader, as are current passports. The State Department said privacy protections will be built into the card, and the chip on the card will not contain biographical information. A 2004 law to strengthen border security called for a passport card that frequent border crossers could use that would be smaller and more convenient than the traditional passport. To relieve a backlog at U.S. passport offices, the Bush administration delayed a requirement that Americans present passports when crossing the U.S. border by land or sea until the summer of 2009. The card vendor will also provide protection sleeves for the cards that will prevent them from being read from afar.

Perhaps the sleeves should be made of lead so Superman can't read them either.

EDSF RESEARCH: PACKAGING TRENDS

Packaging trends at the forefront of the industry include the influence of increased government regulations, a growing focus on both sustainable and intelligent packaging, and a rising emphasis on automated workflows. The packaging industry is just beginning to take advantage of a relatively new industry standard—Job Definition Format (JDF)—which is designed to simplify information exchange among different applications and systems in and around the graphic arts industry. JDF builds on and extends beyond pre-existing partial solutions, such as CIP3's Print Production Format (PPF) and Adobe Systems' Portable Job Ticket Format (PJTF).

CIP3 was formed by Heidelberg in 1995 and was used in the pre-setting of ink fountain keys on lithographic offset printing presses. It also enables the integration of commercial and planning applications into the technical workflow. JDF joins the growing number of standards based on XML, ensuring maximum possible portability between different platforms and ready interaction with Internet-based systems. JDF is a comprehensive XML-based file format and proposed industry standard that allows for end-to-end job ticket specifications to be combined with a message description standard and message interchange protocol.

JDF is designed to streamline information exchange among different applications and systems. It also allows individual systems to integrate with one another to allow data to flow seamlessly without re-keying and the opportunity for error that comes with manual intervention. JDF and the automation it provides has the potential to significantly impact the packaging industry. Currently, there are few examples of the standard in use in this field, primarily due to issues of resource investment, general technology acceptance, and other limitations of JDF in regards to packaging needs.

After several months of investigative research, a survey found that far fewer packaging companies than anticipated were even close to JDF process integration. Most industry executives interviewed indicated that there was a lot of research and strategic planning still to be done before investing heavily in capital expenditures relating to JDF hardware and software applications. The research also suggests that the learning curve requirements associated with these new standards and technologies would take significant time and effort before an efficient comfort level could be reached. The following trends in the packaging industry were revealed in this research:

1. New governmental regulations have a significant impact on package design, content, and consumer information.
2. There is a growing focus on sustainability (e.g. environmentally friendly packaging).
3. Intelligent packaging (e.g., RFID) is gaining strength in the industry.
4. Real-time scheduling and workflow automation are providing value-added benefits for package printers.
5. Significant resource investment (including a substantial learning curve) will be required to implement JDF in the packaging industry.

This research and analysis also extends to the impact of JDF on future packaging workflows and provides insight into what can be done with JDF in different workflows for individual companies. It also highlights areas of the JDF standard requiring additional development in order to be more effective for packaging. This information can be used to further promote JDF as a standard that can encompass the entire graphic arts industry by addressing the needs of this substantial sector in a more practical and complete fashion.

A key finding in this research is the trend towards sustainability, bolstered by the general market interest in environmentally friendly solutions, and the call for corporate social responsibility. In 2005, the Sustainable Packaging Forum and the Sustainable Packaging Coalition were formed to focus on packaging that can stand up to the current demands of the market, while maintaining entirely sustainable and renewable manufacturing, distribution, and disposal processes.

In general, there appear to be three types of practices/materials or implementation methods for sustainable packaging, which can be used in conjunction with each other. Sustainable packaging can be achieved by:

1. Reducing the amount of materials and streamlining production/assembly.
2. Using recyclable materials.
3. Using biodegradable materials.

In terms of packaging reduction, there is the growing use of outserts, particularly in the pharmaceuticals industry. Outserts are printed promotional items similar to traditional inserts but placed on top of the pill bottle rather than being inserted inside a box. They have the look and feel of inserts without the hassle and waste of additional packaging. Moreover, by using smaller and more compact outserts and eliminating the insertion process, material and operational costs are reduced. This practice combined with the notion that outserts are sent directly to the pharmacy results in a higher profit margin for printers. Though companies may need to battle consumer resistance regarding perceptions of traditional pharmaceutical packaging, there are many potential benefits to using outserts, including savings and positive consumer feedback in relation to corporate social responsibility.

The EDSF Study "Trends and Innovations in Packaging including Links to JDF-compliant Hardware and Software Applications" by Christopher Kular, Professor, MS Print Media, Ryerson University, Toronto, Canada, with students Cecily Lo, Diana Brown, Mary Cheng-I Huang, Darsan Sivanantharajah, Matthew Kasumovic, and Cayleigh Nichols is available at www.edsf.org.

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FAME, ONE BOOK AT A TIME

Digital printing is giving writers who never had a chance with big publishers a chance to be published authors. On-demand printing is letting thousands realize their dreams and ambitions. On-line publisher Lulu.com has produced almost 300,000 paperbacks since it began in 2002, and its volume of new paperbacks increases monthly. Amazon.com entered the market through its CreateSpace division. There are now over 100 online, on-demand printing services.

Authors select the book's size, binding style, and paperback or hardcover finishing. After the manuscript is uploaded, they select a font and page format, and design the book's cover. Think of it as vanity publishing but much less expensive. Online, on-demand publishers produce books only after they are ordered and paid for, which eliminates waste and warehousing. They also sell books for the author and take a cut of sales.

Some authors publish on-demand books to attract a major publisher, but most face the challenge of promoting their own work. New authors use blogs, MySpace.com, and Internet sites to market their books, but few reach a mass market.

Publishers have the ability to promote authors on a national scale and get titles onto bookstore shelves. Publishers use professional editors to fine-tune copy, a step that can improve almost any manuscript. The quality of digital printing has improved greatly and few would be able to distinguish the difference from those printed on traditional offset presses.

A NEW DEFINITION OF TINY: 100,000 DPI

The bulging of microfluidics during pressure-driven flow is potentially a major consideration for polydimethylsiloxane (PDMS)-based devices. Such nano- and piezo-based approaches engender a whole new class of fluid delivery systems. Microchannel cross-sectional areas can change drastically as a function of flow rate and downstream microchannel position. Such geometrical flexibility leads to difficulties in predicting convective/diffusive transport for these systems. MEMS (Micro Electronic Mechanical System) has been an enabling technology for both inkjet printing and biomedical applications. Micro devices and systems for jetting biological objects such as cells, proteins, and DNA have been demonstrated.

IBM and academic researchers in Zurich have collaborated on a method that may allow large-scale production by extending a traditional printing method to the nanometer level. Scientists created a colloidal suspension of gold particles by mixing them with dense detergents. They forced the particles into the recesses of a template by moving a meniscus—a cluster of liquid held together by surface tension—across the PDMS, using a thin glass plate to pull the liquid along. With the PDMS mold loaded, it was a simple matter to "print" the gold by transferring the pattern to a surface to which the particles adhered. The authors could readily print wires as thin as 60nm across, or ordered grids of individual gold clusters. The image produced was printed at a resolution of 60 nanometers or 100,000 dpi.

EDSf
The Electronic
Document Systems
Foundation

1845 Precinct Line Rd
Suite 212
Hurst, TX 76054

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Packaging trends

Fame, one book at a time

100,000 dpi

Short takes