

A day in the life of a document

Look at your desktop—not the one on the screen. We know that you certainly have a computer, monitor, and keyboard. What covers the rest of the desktop is probably piles of paper—magazines, reports, brochures, binders, postcards, mail, and all the other stuff of the knowledge age. You may work in the world of cyberspace but you live in a world of paper.

The piles look like chaos but they are not. When a group at Apple Computer studied “piling” behavior years ago, they found that even the most eclectic piles usually make sense to the piler. They found that office workers could explain the rationale of their piles. The closest pile generally represented the most urgent business, and within that pile the most important document is usually on top. Piles are living archives. Over time, they get reorganized—sometimes chronologically and sometimes thematically—and in many more cases chronologically and thematically. Clues about certain documents may be embedded in the file by stacking a certain piece of paper at an angle or inserting dividers into the stack. But why do we pile documents instead of filing them? Because piles of paper represent the process of active, ongoing thinking.

This case for paper is made in “The Myth of the Paperless Office” by two social scientists, Abigail Sellen and Richard Harper. Their premise was reported by Malcolm Gladwell. Sellen and Harper observed that in the workplace, people almost never read a document from beginning to end, the way they would read a novel. We can pick up a paper document, flip through it, read snippets here and there, and quickly get a sense of the content. Paper is spatially flexible, meaning that we can spread it out and arrange it in a manner that suits us. Digital documents also have their advantages. They can be more easily searched, shared, stored, accessed remotely, and linked to other relevant material.

Psychologist Alison Kidd argued that knowledge workers use the physical space of the desktop to hold “ideas which they cannot yet categorize or even decide how they might use.” A messy desk is not necessarily a sign of disorganization. It may be a sign of complexity because those who deal with many unresolved ideas simultaneously cannot sort and

file the papers on their desks—they haven’t yet sorted and filed the ideas in their head. Kidd writes that many of the people she talked to use the paper on their desks as contextual cues to “recover a complex set of threads without difficulty and delay” when they come in on Monday morning, or after their work has been interrupted by a phone call. The piles on our desks are, in a sense, the contents of our brains.

Companies want to move the information in paper documents online to save space and money, and to make it easier for everyone in the firm to have access. But when Sellen and Harper looked at the paper folders they discovered that they contained all kinds of material—advertising paraphernalia, printouts of e-mails, presentation notes, and letters—much of which had been annotated with thoughts and amendments. The advantage of digitized documents is that they can be available to anyone, any time; but, even with annotation tools, they are not as useful as paper.

Paper’s usefulness is in the support of in-process creative thinking, and once that thinking is finished, the paper becomes superfluous. The solution for those who want to reduce paper, they say, is not to *use* less paper, but to *keep* less paper. Paper is a good way to organize information but a poor way to archive information. It is hard to search and it takes up space. We all have the best filing system ever invented right on our desks—the personal computer. The PC essentially replaces the filing cabinet and in/out baskets.

Our flat-top desks have not changed much from the age of the Greeks. During Victorian times desks added nooks and crannies to store paper. Over the years new tools were invented to supplement or reduce paper document use, but paper lives on, less a main actor than in a supporting role. Today and in the future, both digital documents and paper documents support knowledge work.

DID YOU HEAR?

- In April 2005, Dow Jones announced that the Wall Street Journal Online (www.wsj.com) was more profitable than its print edition.
- Nokia has sold its one billionth portable phone since it began producing the devices in the 1980s. They have introduced 400 different cell phone models. Nokia holds 30 percent of the global cell phone market of two billion plus subscribers. Other industry giants include Motorola, Samsung, Sony, Ericsson, and Siemens (Nokia).
- Total newspaper classified ads in the U.S. dropped from 146 million in 2000 to 119 million in 2004, but the number of eBay “ads” went from 238 million to 764 million in the same time period (The Cole Papers).
- Reflecting a growing emphasis on measurable media in the broader marketing mix, direct mail spending will show a robust 7.5 percent growth in 2005 (Winterberry Group).
- Organizations believed they were spending an average of 3 percent of their revenues on copying, printing, and fax-related costs. Research and analysis revealed that overall document expenditures (including hardware, supplies, and people costs) in fact average 6 percent of annual revenues (InfoTrends/CAP Ventures).
- 56.9 percent of media exposure took place in the home, but 21.1 percent took place at work, 8.3 percent in the car, and 13.7 percent in other locations (Ball State University).
- Total advertising expenditures for all media in 2004 increased 9.8 percent to \$141.1 billion compared to 2003 (TNS Media Intelligence).
- Consumers favor free shipping above other money-saving options when shopping online; men favor coupons over sale items, while women prefer sale items over coupons (Ebates).
- In the past 12 months, home printing accounted for 48 percent of the 7.7 billion digital prints made, down from 64 percent in the previous 12 months (Photo Marketing Association).

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WHO IS ON THE INTERNET?

We are spending more time with the Internet and less time with "traditional" media like TV, radio, magazines, or newspapers. That's what 2,600 Web users said when surveyed by online marketer Burst! Media. Queried about their media consumption habits over the past year, 61 percent of the respondents said they spend more time on the Internet today than they did a year ago, with 32 percent saying they spend "much more time," and 29 percent claiming to spend "somewhat more time" online. Thirty-six percent said they are spending less time today than a year ago watching television; 34 percent spend less time reading magazines; 30 percent devote fewer hours to reading the newspaper; and 27 percent aren't listening to the radio as much as they did.

Teenagers and 18-to-24-year-olds—62.6 percent and 60.9 percent of the survey group, respectively—said they were spending more time today on the Internet than a year ago. Eighteen-to-24-year-olds are more likely than other segments to say they are spending less time today than a year ago listening to radio—33.7 percent—or watching television—40.5 percent.

The Pew Internet Project survey found that the Internet has grown in importance at America's work places to the point where 37 percent of full-time workers, and 18 percent of part-time workers, have Internet access at work. Some 38 million fulltime workers in the nation have Internet access at their jobs and two-thirds of them (67 percent) go

online at least once per day. When they are online, most are doing job-related research and/or using email. Seventy-two percent of full-time workers with Internet access at work say it has improved their ability to do their jobs. Wired workers are most likely to be older and highly educated. Thirty-two percent of full-time workers with Internet access at the office are over 45 years old (compared to 14 percent of all Internet users). Thirty-one percent of wired workers have college degrees and another 20 percent have a graduate degree (compared to 24 percent of all Internet users who have a college degree and 13 percent who have a graduate degree). Forty-one percent of wired workers have been online for three or more years (compared to 31 percent of all Internet users) and only 9 percent got Internet access within the last six months (compared to 16 percent of all users).

Wired workers are also more likely to have Internet access both at home and at work, which is another indication of a more Net-savvy, experienced population. Seventy-three percent of full-time workers with Internet access on the job also go online from home (compared to 36 percent of all Internet users). Wired workers are very task-oriented and they do not spend long periods online during the day. Fifty-eight percent of full-time employees with Internet access at work spend an hour or less online on a typical day. On the productivity side, 47 percent of all Internet users and 72 percent of those with Internet access on the job say the Internet helps them do their jobs.

The internet boom is a boom with the Boomers

Two-thirds of adults ages 50 to 64 use the Internet, and as they age, they will significantly alter the media landscape, according to an eMarketer report. The current generation of senior citizens (65 and older) are considered less likely to be Internet-savvy, with just 28 percent of that group using the Web. These seniors retired before online access became common in the workplace. The report cites nutrition, financial services, health care, pharmaceuticals, and real estate as just a few of the categories that will undergo massive change as baby boomers demand online services that cater to their expectations.

The report estimates that there are 33.2 million 50- to 64-year-olds online—three times more than the number of online users age 65 and older. The oldest of this group will turn 65 in 2006. Unlike today's seniors, boomers, those born between 1946 and 1964, are proficient and dedicated Internet users. Forty-four percent of Internet users ages 50 to 64 have high-speed broadband access, compared with 28 percent of those age 65 and older.

As boomers (50- to 64-year olds) approach the next phase of their lives, companies will have to adjust to this demographic group, with \$1 trillion in spending power, according to eMarketer. The older the Internet user, the more willing they are to click on sponsored links, eMarketer reported. For those age 19 and younger, there is a 50/50 chance that they will click through on links that seem relevant; 69 percent of 30- to 39-year-olds said they would click through; 80 percent of those ages 50 to 59 say the same. Just over 90 percent of those age 60 and older said they would click on a sponsored link if they thought it was relevant.

Boomers may not fully retire and may work part time, increasing their Internet use.

VANNEVAR BUSH & THE KNOWLEDGE APPLIANCE

Vannevar Bush was the godfather of our wired age. His ideas for automating knowledge sharing were the basis of the digital age, but even more important was his influence on the institution of science in America. He invented the relationship between the government and the scientific establishment. During WWII he changed the way research was carried on in the U.S. which later fostered the environment in which the Internet was created.

Bush worked on machines that would automate human thinking and sort through the growing base of accumulated knowledge. In the 1930s microfilm was popular as a storage method, especially among librarians. Bush created a “rapid selector” desk that could store huge amounts of information on microfilm. The user could select documents which would then be projected on a screen.

In 1937, Bush became president of the Carnegie Institution and influenced the direction of research in the U.S. and advised the government on scientific matters. The U.S. was not prepared for another world war and little was spent on military research. In 1940, Bush met with President Roosevelt and detailed his plan for mobilizing military research. He proposed a National Defense Research Committee (NDRC). The committee would bring together government, military, business, and scientific leaders to coordinate military research. Roosevelt quickly agreed. Bush was made chairman and given a direct line to the White House. In 1941, all research was placed under the Office of Scientific Research and Development (OSRD). Technology was key to winning a war and Bush institutionalized the relationship between government, business, and the scientific community. Bush is responsible for the architecture of government support for science.

In 1945, Bush wrote an article entitled, “Science-The Endless Frontier.” He outlined the importance of continued support for research. He called for a National Research Foundation that could develop and promote a national policy for scientific research and scientific education. It could also support basic research in nonprofit organizations, develop scientific talent in American youth by means of scholarships and fellowships, and, by contract and otherwise, support long-range research on military matters. In 1950, the National Science Foundation (NSF) was created to implement his vision.

In 1945, Bush published an article in the *Atlantic Monthly* called “As We May Think,” about the automation and augmentation of human thought. In the article he described a theoretical machine called a “memex.” The

memex was a storage and retrieval device using microfilm. It would consist of a desk with viewing screens, a keyboard, selection buttons and levers, and microfilm storage. Information stored on the microfilm could be retrieved and projected on a screen. The machine extended the powers of human memory and association. Just as the human mind forms memories through associations,

the user of the memex would be able to make links between documents. Bush called these associative trails. Ted Nelson, who coined the term “hypertext” in the 1960s, acknowledged his debt to Bush. The World Wide Web is really a giant hypertext engine for information. Vannevar Bush died in 1974. Many now look back through his life and see Bush as a visionary who had a glimpse of the future.

Printed information in the financial services industry

Gartner and faculty at the University of Connecticut, in collaboration with The Electronic Document Systems Foundation (EDSF), conducted a study in 2005 to identify the attitudes of business managers and to examine how they relate printing as part of their business processes.

Many organizations treat printed information separately from the business processes it supports. This observation is based on the fact that IT and purchasing departments, not business managers, play the dominant roles in decision making for departmental printing and copying solutions.

Frequently, copier and printer Requests For Proposals (RFPs) or bids treat printing as a component of the hardware infrastructure with a focus on upgrades to existing equipment. The objectives of this process are to help organizations consolidate devices and achieve faster printing speeds, lower operating costs, and increased product reliability. Consequently, equipment and software providers struggle to introduce new thinking and technology that better applies printed information in optimized workflows that support specific business processes.

Some costs can be reduced by managing printing (equipment) as infrastructure: device consolidation and print volume optimization are important goals. However, viewing printing (copy) applications only as

basic infrastructure often misses larger opportunities for cost reduction that organizations can achieve by eliminating or at least minimizing printing volume itself. The phrase “the least expensive page is the one not printed” captures this thinking.

Viewing printing as infrastructure also misses the opportunity to improve customer communication, gain a competitive advantage, and drive revenue growth.

Business managers, more than IT or purchasing managers, are best suited to optimize printing within departmental workflows. Business managers better understand the business processes and are responsible for improving their department’s performance; yet, equipment and software providers struggle to provide information about new ways to optimize print that can make them more successful.

This study highlights how managers view printed information as part of their departments’ business processes, and how these managers work (and don’t work) with other departments to implement new technology. For this survey, which focuses on managers from the financial services industry, completed responses were obtained from more than 350 managers for analysis.

“Criticality of Printed Information in the Financial Services Industry” can be found at www.edsf.org.

From the EDSF Gartner and UCONN study “**Criticality of Printed Information in the Financial Services Industry**” discussed above: Only 41 percent of the managers involved with print decision making (N=93) agreed with the statement, “print and copying operations are managed by the same group.” Inside that question, the study found a systematic difference between internal-facing and customer-facing departments: 25 percent of the customer-facing departments indicate that the same group manages the print and copy operations, while a far higher percentage (58 percent) of internal-facing departments indicate this.

Print and copy operations are managed by the same group

	<i>Agree</i>	<i>Disagree</i>	<i>Neutral</i>
Internal-Facing	58%	29%	13%
Mixed	37%	33%	30%
Customer-Facing	25%	58%	17%
Grand Total	41%	35%	24%

Your refrigerator just e-mailed

Manassas, VA and COMTek announced that Manassas is now the first city in the U.S. with full-scale deployment of broadband-over-powerline (BPL) technology for Internet access. COMTek, which owns and operates the Manassas BPL network, is developing nine similar projects with utilities and other partners around the U.S. This technology makes the common electric socket serve as your home's connection to broadband. With a new chip developed by Matsushita Electric Industrial, this technology does away with cables or wireless networks. Products embedded with the chip from their Panasonic division can link to a broadband network by plugging into any electrical outlet.

Plug the special device made by Matsushita into a socket and then plug an appliance into the special device for instant connection. Matsushita will sell refrigerators, TVs, and other products with the chip already installed. This technology uses electric wiring in the home for both electricity and data. Matsushita's system is unique because it delivers high-speed broadband information at up to 170 megabits per second, which is faster than Ethernet.

In Matsushita's home of the future, you will be able to download and watch high-definition movies in any room with an outlet. You can use a mobile phone or laptop to query a network-connected refrigerator as to whether you're low on milk. Or you may turn devices off or on, such as your air-conditioner from outside the home. Even homes with optical fiber connections don't have broadband outlets in every room. But sockets are everywhere.

Personalized upholstery fabric

Some makers of fabric for sofas and chairs now are using digital printers to create patterns incorporating as many as 50 colors. Colors are sprayed onto fabrics just as an inkjet printer spits out documents, and printing can begin without extended preparation. Fabrics printed in traditional ways, by hand, or with rotary machines, rarely use more than 15 or 20 colors. The new technology will lead to more complex, multi-colored patterns and custom options. Digitally printed fabrics are becoming widely available.

Digital printers also make it easier to print small batches of fabrics. High priced traditional printing has kept these fabrics too expensive for retailers until recently and only decorators and a few high-end home-furnishing manufacturers have offered them. Prices remain high, mostly because the new printers cost \$200,000 or more. The new fabrics have more colors and patterns in everything from fabrics to wallpapers to housewares.

Printing many shades through rotary-screen or hand-printing methods is costly because a different screen or stencil has to be produced for each color. The colors are inked onto the fabric through the screens. Digital printers tend to be slower—17 to 20 yards per hour—compared with rotary screen printing which can print about 60 yards a minute. Digital printers can create much larger designs. Screen printing usually prints designs that are up to about 36 inches wide, and hand printing can produce patterns up to about 50 inches in width. There is virtually no limit to the length of a digitally printed design.

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Document life

Vannevar Bush

Wired appliances

Who is on the Internet?