Build

White Paper Series

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BRAIN POWER
A number of recent research studies reveal surprising truths about the many ways in which paper aids cognition.

DOCUMENTED PROOF
Companies find that paper-based communication is superior for everything from marketing to compliance.

GROWING INTEREST
There is more forestland in the U.S. today than in decades past, thanks in no small part to the paper industry.

Today's Office: Not So Paperless After All

WHY PAPER CONTINUES TO THRIVE IN THE DIGITAL AGE

IN COLLABORATION WITH Domtar

The concept of a "paperless office" can be traced back decades, to the Xerox Palo Alto Research Center (PARC), which pioneered a huge number of Internet-era innovations, from the computer mouse to the graphical user interface (not to mention the laser printer!). In 1975, George Pake, the head of PARC, predicted that by 1995 "I will be able to call up documents from my files on [a desktop] screen, or by pressing a button. I can get my mail or any messages. I don't know how much hard copy I'll want in this world."

Much of Pake's vision has come to pass. But as for how much hard copy one might want, Pake's rhetorical question has a surprising answer. It turns out that people not only continue to prefer paper for a large number of both personal and work-related tasks, but our brains may actually be hard-wired to respond more effectively to information that is printed on paper. This has profound implications, from the classroom to the workplace, in terms of how children and adults assimilate, analyze, retain and share information. The advantages of paper are something companies need to build into their communications strategies, be it for marketing purposes, records retention, or a host of other tasks. And it's worth noting that the environmental impact of paper versus electronic communication is rife with misperceptions and outright myths.

The benefits of paper are as numerous as they are tangible. In fact, this report highlights many of them, not only in terms of the information it provides but the way in which it provides it. Grab a pencil and start by taking the quiz on page 7, or open to any page and see at a glance why paper remains so invaluable. Fold it. Pass it to a colleague. It's up to you. You'll soon see that while there are circumstances in which companies are, understandably, using less paper, the advent of a genuinely "paperless" office now seems not only unlikely but ill-advised. When it comes to the many virtues of paper, there is always a new chapter being written.

Paper Makes You Smarter (Seriously)

one MILLION

1 million printers are manufactured each day

Swipe. Tap. Pinch-to-zoom. No doubt about it, there are some dazzling features available when you read articles, e-mail—or maybe even this report—on a tablet or other electronic device.

But recent research underscores some surprising benefits of paper-based communication. It turns out that reading the printed page can help you retain and comprehend more of what you've read compared to electronic alternatives. At the other end of the spectrum, reading a printed page is a proven way to reduce stress!

Why? For one, a printed page is less distracting. There are no hyperlinks to draw your attention away from the subject at hand, nor are you tempted to click away for a quick game of Angry Birds. A study conducted by Winona State University psychologists found that college students who use laptops in class spend nearly one-fourth of a 75-minute class "multitasking" (some of those tasks may have related to the course, but probably not all). The more the students used their laptops, the lower their performance.

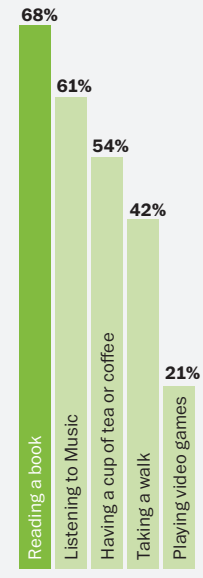
Distraction isn't the only issue. Apparently, people don't apply as much mental effort to reading on a screen as they do to the printed page. San Jose State University researchers found that when people read on screens they tend to skim and browse rather than focus on the text. Websites are designed, in fact, to (depending on your point of view) either cater to this tendency or cause it, by limiting most text to bite-sized chunks and bulleted lists, inevitably sacrificing depth. A study conducted by web usability expert Jakob Nielsen found that a website visitor will read, at the most, 28% of the words on a typical web page; 20% is more typical. "Scanning" is the term that Nielsen uses to describe how the material on a web page is read. Or should we say, "read"?

There was a time when poor screen resolution was commonly cited as a barrier to electronic reading, but Nielsen has studied newer, very high resolution tablets and e-readers and has found that while the experience of reading on such devices is much better than what he calls "the misery of reading from PC monitors," users still read up to 10% slower on tablets versus the printed page, with no increase in comprehension.

It turns out that the very physicality of the printed page is a significant factor in both comprehension and long-term retention of information. Scientists theorize that it's in the wiring—of our brains, that is. Cognitively, we interpret individual letters on a printed page as physical objects and we place them in a "landscape." "The implicit feel of where you are in a physical book turns out to be more important than we realized," Abigail Sellen of Microsoft Research Cambridge tells Ferris Jabr in an article for *Scientific American*. "Only when you get an e-book do you start to miss it."

A recent study of 10th graders from Norway's University of Stavanger showed that those reading on paper performing better when tested on the content than those who could only access the information on a screen. Numerous surveys and studies indicate that when people want to thoroughly understand a text, they often choose to read it on paper even when available in electronic form. This appears to not only help them remember information longer, but to truly "know" it—that is, to be able to apply it in other contexts.

The benefits of reading a printed page extend beyond acing the bar exam or remembering who won the 1986 World Series: According to a 2009 study con-



Rsearch reveals that reading a (physical) book is a great way to reduce stress.

ducted by consulting firm Mindlab International, reading a book for as little as six minutes can reduce stress levels by 68 percent! "By losing yourself in a thoroughly engrossing book you can escape from the worries and stresses of the everyday world," notes neuropsychologist David Lewis, who oversaw the research. The benefits are twofold: relaxation, and, at the same time, what Lewis describes as "an active engaging of the imagination as the words on the printed page stimulate your creativity."

As electronic devices improve and proliferate, researching the relative merits of print versus electronic reading will remain a very active field of study. With each new chapter, experts seem to be discovering the reasons why paper-based communication appears poised to live happily ever after.

Meanwhile, at the Office. . .

33 BILLION

Spam e-mail wastes **33 billion kilowatt hours** of electricity each year, the equivalent CO2 emissions of 3 million cars using 2 billion gallons of gasoline.

A decade ago, in their prescient book *The Myth of the Paperless Office*, Abigail Sellen and Richard Harper cited four attributes of paper as a communications tool that no doubt still resonate with anyone wondering whether to ditch the office printer:

- **FLEXIBLE NAVIGATION.** The ability to physically navigate through documents is an important part of reading: It helps readers plan, check facts, and confirm understanding. In their research, Sellen and Harper found that while navigating online can often be frustrating and distracting, navigating a printed document or book is seamlessly integrated with the act of reading.

- **INTERWEAVING.** Sellen and Harper had their test subjects move quickly between reading an article and jotting down notes on it. Those using paper had a much easier time than subjects working online.

- **ANNOTATING WHILE READING.** People like to make notes directly on their reading material, especially when studying a text. While some e-readers allow for note-taking, the process is not nearly as fluid as scribbling in the margins of a printed page. This has advantages when it comes to presentations: By distributing paper versions of your presentation, your audience can follow along and annotate, in addition to having a physical "take-away" that can be discussed and referred to later.

CARE ABOUT CUSTOMERS? PUT IT IN WRITING.

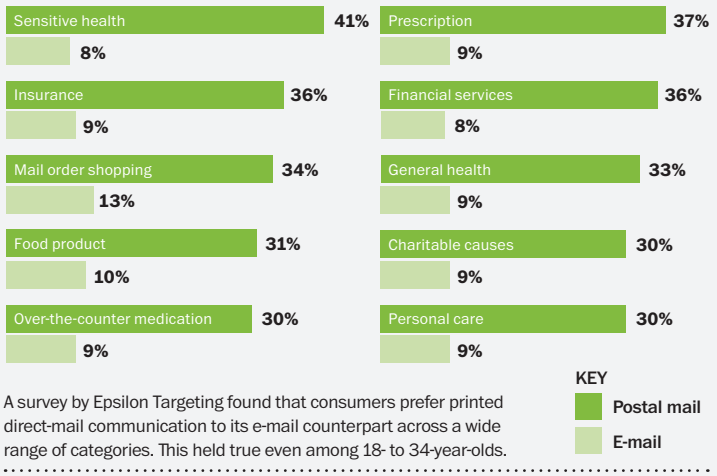
Having information in hand, literally, isn't just a perk for your coworkers. It turns out your prospective customers like it as well. According to marketing firm Epsilon Targeting's 2011 *Consumer Channel Preference Study* of nearly 5,000 North American consumers, 50 percent of U.S. consumers prefer direct mail to e-mail; the preference for direct mail even extends to the 18- to 34-year-old demographic.

Earlier this year, a survey by Target Marketing found that direct mail delivers the strongest ROI for both customer acquisition and retention. Among the marketers surveyed, 31 percent report that direct mail is the most effective means of landing new customers, nearly double those who cited email (17 percent) or social marketing (13 percent). The results are similar when it comes to customer retention, with 38 percent giving direct mail top honors, followed by email (29 percent) and social media (10 percent).

If paper is a great way to win new business and keep customers coming back, it also appears to be invaluable for enhancing their sense of security. Banks, credit card companies and many other businesses have been promoting the benefits of e-billing and "paperless statements" for many years, yet

to date only 15 percent of consumers have actually "switched off" paper statements, according to financial website Bankrate.com.

One major concern, of course, is cybercrime, including identity theft, hacking of personal information, outright theft of assets, and many related forms of fraud. In 2012, the Internet Crime Complaint Center received almost 300,000 reports of cybercrime, with consumers suffering an aggregate financial loss of almost half a billion dollars, up 8.3 percent from the previous year.



A survey by Epsilon Targeting found that consumers prefer printed direct-mail communication to its e-mail counterpart across a wide range of categories. This held true even among 18- to 34-year-olds.

Consumers view paper as a safe, effective way to transmit, review, and archive financial information. And banks appear to agree, since they are actually using more paper now than in years past. The reasons cover two distinct advantages of paper: its suitability for satisfying new regulatory requirements, and its appeal as an effective way to market new services to customers.

Finally, as we'll explore in the next chapter, going paperless doesn't mean going green. More and more data is now being stored in and transmitted through "the cloud,' which may sound ethereal and weightless, but environmentally it's anything but. Cloud data doesn't exist in thin air but in huge data centers that consume vast amounts of energy. How much? A recent study sponsored by the *New York Times* estimates that worldwide, data centers use about 30 billion watts of electricity, roughly equivalent to the output of 30 nuclear power plants.

Most of this energy—upwards of 90 percent—is wasted as these data centers operate at a level that can meet peak demand 24 hours a day, seven days a week, even though actual peak levels are reached only occasionally. Many data centers also rely on banks of diesel generators in the case of power outages, and the pollution these cause has increasingly been cited for violating clean air regulations.

The bottom line? Paper is good for business, and, as we'll see, it's pretty good for the environment as well.

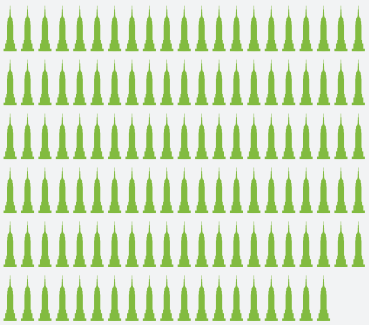
Paper Is (Very) Sustainable

REPLANT, RECYCLE, REPEAT

Forests aren't just beautiful: they also stabilize our climate, enrich the soil, regulate the water cycle, and provide both wildlife habitat and many forms of human recreation. You might be surprised to learn that even as paper production has increased over the past 50 years, so has the number of forests. In fact, the paper industry plants three times more trees than it harvests.

Several third-party organizations, including the Forest Stewardship Council™ (FSC®), now certify such practices. FSC-certified forest management must adhere to ten principles that embody sustainable harvesting practices, environmental protection, and social benefits. These principles are based on 57

exacting criteria that every FSC-certified forest must meet. For every tree harvested, several more are replanted or naturally regenerated in its place. Biological diversity, water resources, and soil are carefully preserved, and the rights of indigenous people are protected. Domtar, one of the largest paper companies in North America, now sources three times as much of its wood from such certified forests as it did just a few years ago, and all of the company's facilities, including its mills and converting centers, are FSC chain-of-custody (CoC) and controlled wood (CW) certified, meaning that customers can be sure that all of the company's products are ethically sourced from non-endangered origins. In 2012, 76 percent of the energy required by Domtar's mills came from renewable sources — and the vast majority of that was self-generated. The company also used more than 150 million pounds of recycled material in the production of its products.



124 EMPIRE STATE BUILDINGS

More than **50 million tons of paper was recovered from recycling in 2010**, enough to fill the Empire State Building 124 times.

There are more forests in the U.S. today than 70 years ago; the paper industry plants three times more trees than it harvests. **The paper industry accounts for only 11% of cut trees.**

2020 VISION

Speaking of recycling, did you know that paper is the most recycled product on Earth? According to the U.S. Environmental Protection Agency (EPA), Nearly 50 million tons of paper and paperboard were recovered in 2012—334 pounds for each person living in the U.S. That represents a recycling rate of 65 percent, a number expected to reach 70 percent by 2020, according to the American Forest & Paper Association (AF&PA). Recycling paper offers tremendous environmental and economic benefits, including:

- **Reducing greenhouse gas emissions that can contribute to climate change**
- **Saving landfill space** (Since 1994, far more paper has been recovered in the U.S. than has ended up in landfills.)
- **Reducing energy and water consumption.**

A GROWTH INDUSTRY

It will not come as news to you that paper is made from trees, but the production of the former does not require the destruction of the latter. Far from it. Thanks to reforestation, wooded areas in the U.S. have actually grown in acreage over the past century. About one-third of the U.S.—747 million acres—is covered with trees—more today than we had 70 years ago. And some 4 million trees are planted each day. In fact, according to the AF&PA, net annual growth of the nation's commercial forests exceeds harvests and other losses by a striking 47 percent annually. As we mentioned earlier, forests are a critical component of our environment. So it's worth noting that 91 percent of all trees planted in America during 1999 were planted by forest-product companies and private timberland owners.

And Now, Please Put Pen to Paper. . .

A CHANCE TO MAKE YOUR MARK(S)

When one considers that 2 million computer printers a week are sold around the world, "paperlessness" appears to be a long way off. It's not simply that old habits die hard. Take this quiz to find out what we mean.

1 **Compared with paper, the average person's reading speed when using a tablet or e-reader:**

- ◯ **a.** Increases ~10%
- ◯ **b.** Increases ~5%
- ◯ **c.** Is about the same
- ◯ **d.** Decreases ~5%
- ◯ **e.** Decreases ~10%

2 **You can reduce stress by 68% if you read a physical book for:**

- ◯ **a.** About 3 minutes
- ◯ **b.** About 6 minutes
- ◯ **c.** About 18 minutes
- ◯ **d.** About 30 minutes

3 **The number of business cards printed in the U.S. each day is:**

- ◯ **a.** 4 million
- ◯ **b.** 12 million
- ◯ **c.** 28 million
- ◯ **d.** 41 million

4 **Percentage of consumers who have opted out of paper statements from their banks and other billers is:**

- ◯ **a.** 14%
- ◯ **b.** 26%
- ◯ **c.** 34%
- ◯ **d.** 41%

5 **The U.S. currently has a paper recycling rate of approximately:**

- ◯ **a.** 35%
- ◯ **b.** 45%
- ◯ **c.** 55%
- ◯ **d.** 65%

6 **That rate equals how much per every person in the U.S.?**

- ◯ **a.** 75 pounds
- ◯ **b.** 150 pounds
- ◯ **c.** 225 pounds
- ◯ **d.** 330 pounds

7 **The difference between the number of trees planted each year and those harvested or otherwise lost results in:**

- ◯ **a.** A net loss of 0.5%
- ◯ **b.** Neither a loss nor a gain
- ◯ **c.** A net gain of 20%
- ◯ **d.** A net gain of 45%

Answers: 1-E; 2-B; 3-C; 4- A; 5-D; 6-D; 7-D

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ABOUT DOMTAR

Domtar Corp. designs, manufactures, markets and distributes a wide range of of fiber-based products, including communications papers as well as specialty and packaging papers. For more information, visit us at **domtar.com**

ABOUT BUILD

The Build Network helps leaders of midmarket companies grow their businesses by providing a range of insights via its quarterly "catalog of ideas," research, events, white papers, and other services.

"My aim is to put down on paper what I see and what I feel in the best and simplest way."

–ERNEST HEMINGWAY

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