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Living in a Digital World

Technology has created new opportunities to connect and interact. Yet, researchers are increasingly concerned that heavy technology usage is changing people's behavior in less than desirable ways.

It is no secret that humans have an innate urge to connect with one another. In fact, research shows that well-adjusted people spend more time engaged in social interaction and activities. However, in the age of always-on digital technology, the notion of connectedness—and the definition of friendship—is changing radically. Increasingly, the route to human interaction is through a digital device.

Approximately two billion people now tap into the Internet. About five billion people use mobile phones and a growing number of these devices offer sophisticated computing and communications capabilities. There's cell service atop Mt. Everest and in remote South Pacific atolls. Incredibly, the average 13- to 17-year-old in the U.S. sends about 110 text messages per day. In fact, it's become increasingly difficult to go anywhere without getting caught in the tractor beam of digital technology.

Not surprisingly, as people use these devices more frequently—and for more hours each day—researchers are studying the effects with growing interest. Add to this the extreme multitasking that we increasingly engage in, either by choice or necessity, and it is clear that society is venturing into a brave new frontier. "We're seeing people so absorbed in digital media that it's becoming their primary reference point for life," observes Clifford Nass, a communications professor at Stanford University and author of *The Man Who Lied to His Laptop: What Machines Teach Us About Human Relationships*.

What is the impact of digital immersion? How is it changing people's thinking and behavior? And how does it affect the way we view the world and interact with others? It's a complex equation that researchers are only now beginning to understand. "Digital technology brings people together," says Michael Suman, research director at the Center for the Digital Future at the University of Southern California. "It allows people to connect in ways that were never before possible. But it also creates new sets of questions and potential problems."

"For many of us, it is becoming increasingly difficult to control the impulse to check the inbox yet again," notes Yair Amichai-Hamburger.

Net Losses

There's no disputing that digital technology has thoroughly invaded our lives. A 2011 study conducted by telecommunications giant Ericsson found that 35% percent of iPhone and Android users check their email or Facebook account before getting out of bed in the morning. In addition, 40% use their phones in bed before they go to sleep at night. The average American is digitally connected between 2.5 and 3.5 hours a day. Nielsen reports that social networking, online games, and email are the biggest attractions.

Few people have examined the topic more closely than Sherry Turkle, a professor of social studies of science and technology at Massachusetts Institute of Technology and author of *Alone Together: Why We Expect More from Technology and Less from Each Other*. She believes that digital immersion is seductive because it seemingly addresses our human vulnerabilities. "As it turns out, we are very vulnerable,"

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she says. "We are lonely but fearful of intimacy. Constant connectivity offers the illusion of companionship without the demands of friendship. We can't get enough of each other if we can have each other at a distance and in amounts that we can control."

The heavy use of digital technology trains society to have less patience for the particular skills, pace, and sensitivities of face-to-face interaction. "We become used to the volume and velocity of the digital medium," explains Turkle. "We adapt to it and, over time, become more comfortable with its simplifications." The upshot? "People complain that they are too busy communicating to think, too busy communicating to create, and, in a final paradox, too busy communicating to fully connect with the people who matter. We are in continual contact but we are alone together."

The ripples of digital technology also make it easier to hide. Turkle says many people admit they are relieved to leave a voicemail message rather than reach the intended person. Some say that texting lets them avoid the time commitment of phone calls. "We are using technologies to dial down human contact," she says. "People are comforted by being in touch with a lot of people whom they also keep at bay." The result? "We imagine that email and texting will give us more control over our time and emotional exposure" but, eventually, "anything but staccato texts seems too exhausting."

While digital technology can connect families and friends over geographic distances, it is critical to recognize that Facebook pokes and postings aren't equal to actual conversation.

Master or Slave?

The allure of digital technology impacts people in other ways. Suman says the students he teaches have more trouble than ever focusing on lectures and learning. Text messages and emails arrive in gibberish, he says, and students end up asking the same questions over and over. Even when they have switched off their devices they are too often unable to think through concepts and ideas. "They're increasingly challenged to engage in deep and meaningful thought," he says. "Sequential, logical, rational thinking seems to be severely compromised."

A breakdown of social etiquette—if not outright rudeness—is also more pervasive, Nass says. "Today, people think it's okay to text in the middle of dinner, at a meeting, in class, wherever. They text while you're talking to them and then they look up and say, '*What?*' " Humans, he says, aren't good at multitasking. In fact, studies show that multitasking doesn't exist. We simply switch back and forth from one task to another very quickly. The heaviest "multitaskers" show signs of diminished short-term memory. In other words, they're forgetful.

Yair Amichai-Hamburger, director of the Research Center for Internet Psychology at the Sammy Ofer School of Communications, says it is time to consider whether we are served or enslaved by today's technology. "For many of us," he notes, "it is becoming increasingly difficult to control the impulse to check the inbox yet again." Worse, he says, we're constantly surrounded by advertisements urging us to find fulfillment through the acquisition of material goods. The latest acquisition of a shiny new gadget gives us a quick fix but does nothing to feed the soul.

For many, the net effect is an always-on digital lifestyle. In a world where time is often equated to money, society increasingly buys into the notion that being technologically tethered is essential and even unavoidable. What's more, as employers

Society

Gender Bias at Wikipedia?

A substantial gap in the number of male versus female editors at Wikipedia may be creating a gender-oriented disparity in the popular online information source's content, according to research by the University of Minnesota's College of Science and Engineering.

Only 16% of the new editors who joined Wikipedia in 2009 identified themselves as female and those females made only 9% of the edits by the editors who joined that year.

The findings of Minnesota's GroupLens Research Lab were recently published in a paper, "WP: Clubhouse? An Exploration of Wikipedia's Gender Imbalance," and discussed in a YouTube video, "Research Proves Gender Imbalance on Wikipedia."

"We think people who use Wikipedia as a resource need to be aware our results suggest there are disparities in the quality of its content coverage and those disparities seem to be related to the gender gap," says lead researcher Shyong (Tony) K. Lam. "For example, we found Wikipedia's coverage of movies of particular interest to females tends to be lower in quality than its coverage of movies with large male audiences."

The research gives no indication as to why the gender gap exists. "Our research was entirely quantitative and based on data made publicly available by Wikipedia," Lam adds.

"What surprised us most was this gap hasn't changed in five years. It was 16% five years ago and it's 16% now," says Lam. "This compares with other areas of the Web, especially in other social media like Facebook and Twitter, where the gender gap has not only closed but has become female dominant."

Lam has received acknowledgment from Wikipedia that it received the research results but has gotten "no indication as to whether any action will be taken," he says.

The research will be presented at the 2011 WikiSym conference in Mountain View, CA, in October.

—Paul Hyman

require individuals to check digital devices and respond 24/7, there's no clear separation between home and work. These pressures, Amichai-Hamburger says, put modern society at danger of "swapping standard of living for quality of life."

In fact, studies show that heavy technology use can result in higher levels of loneliness and depression—and the U.S. and other countries are trending upward. Irena Stepanikova, an assistant professor of sociology at the University of South Carolina, examined various digital tools in a 2010 study, "Time on the Internet at Home, Loneliness, and Life Satisfaction." Researchers found that people who spent more time at home browsing the Web and using instant messaging, chat rooms, and newsgroups felt lonelier and less satisfied. Email, on the other hand, neither increased nor decreased mental well-being.

The thing that's easy to overlook, Stepanikova says, is that we frequently use digital tools in isolation as a way to connect with others. While digital technology can connect families and friends over geographic distances, it's critical to recognize that Facebook pokes and postings aren't equal to actual conversation. Too often, "we use the Internet alone, and even if others are present, we do not actively interact with them," she says. Consequently, "the solitude of these activities may counter some of the potential social benefits."

It's no small problem. "The more time people spend at home on the Internet," says Stepanikova, "the less time they spend on social activities, parties, conversation, attending sports and cultural events—and essentially on any activities performed together with family members and with friends."

Switching Off

A growing number of researchers and social scientists believe it is important to take steps to regain control of the technology and our lives. One approach that is gaining popularity is the concept of switching off electronics and taking clearly defined breaks. In 2010, the Sabbath Manifesto project emerged. It promotes the idea of unplugging every seventh day, "deadlines and paperwork be damned" and creating more defined boundaries in order to avoid "destroying the fabric of your life."

Amichai-Hamburger says that being unplugged at least one day a week "gives you a chance to be with those you care about." No less important: It changes the flow of life and provides perspective about what's really important. "It reminds us that we have to lead technology and not be led by it. It gives us space to think."

Turkle also believes that venturing offline can be refreshing. "It can be a reminder of the importance of solitude that refreshes and sustains." Nevertheless, she believes that "unplugging" is not the way of the future and that we've only begun the process of adapting to digital technology and learning how to manage our actions and reactions effectively.

"We must begin to make corrections," says Turkle. "We are not doing justice to the complexity of the problems we face, just as we are not doing justice to each other. We need to learn how to be on a digital diet so that we can make healthy choices about the kind of life we want to lead, the kind of life that will make us productive, and how we can be content and fulfilled individually and in relationships." C

Further Reading

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Milestones

CS Awards

Microsoft Research, ACM SIGPLAN, IEEE, and Women Entrepreneurs in Science & Technology (WEST) recently honored a select set of computer scientists for their innovative research and leadership.

MICROSOFT RESEARCH FACULTY FELLOWS

Microsoft Research recognized eight new faculty members from Austria, Australia, Brazil, and the U.S. as 2011 Faculty Fellows. They are Maria Florina Balcan, Georgia Institute of Technology; Krishnendu Chatterjee, IST Austria; Jure Leskovec, Stanford University; Alistair McEwan, The University of Sydney; Shwetak Patel, University of Washington; Anderson de Rezende Rocha, University of Campinas; Keith Noah Snavely, Cornell University; and Brent Waters, University of Texas.

SIGPLAN SOFTWARE AWARD

ACM SIGPLAN awarded the 2011 SIGPLAN Programming Languages Software Award to Simon Peyton-Jones and Simon Marlow of Microsoft Research, Cambridge, for their authorship of the Glasgow Haskell Compiler, the preeminent lazy functional programming system. Peyton-Jones and Marlow donated their $2,500 prize to Haskell.org.

EMANUEL R. PIORE AWARD

IEEE presented the Emanuel R. Piore Award to Fred B. Schneider, Samuel B. Eckert Professor of Computer Science at Cornell University, for "contributions to trustworthy computing through novel approaches to security, fault tolerance, and formal methods for concurrent and distributed systems."

WEST LEADERS

WEST celebrated its 2011 Leadership Awards at the Microsoft New England Research & Development (NERD) Center, and presented Leadership Awards to Lydia Villa-Komaroff, chief science officer for Cytonome; Jennifer Tour Chayes, distinguished scientist and managing director of Microsoft's NERD Center; Laura Fitton, founder and CEO of OneForty.com; and Joanna Horobin, CEO of Syndax Pharmaceuticals.

—Jack Rosenberger