The High Cost of Technology

It's hard to argue against progress, but it has its downside, too

The world is watching to see how the EU will respond to the European financial crisis. America, with an unemployment rate of 9 percent at this writing, up from 4.5 percent in 2006, is struggling to avoid a double dip recession. And, with the United States presidential election months away, there is one thing on everyone's mind: jobs.

Many blame the dire unemployment statistics, at least in part, on structural unemployment, in which the skills offered by the labor market differ from those sought by employers. With the failures of Lehman Brothers, Bear Stearns, Countrywide, and others, financing for construction projects dissipated, signaling the end of the construction boom. Construction workers, real estate brokers, and escrow agents found themselves out of work without transferable skills. The result: education gaps that are often difficult to fill.

In the speech recognition world, education gaps are widespread. Social media sites like LinkedIn specialty groups advertise 20 to 100 open jobs at a given time, not including positions filled by word of mouth. While some positions on a speech recognition team, such as Java and Web service developers, require technology skills that are technical but relatively easy to fill, these roles are not speech-focused.

As companies look to fill speech-focused positions, such as voice user interface designers or audio production specialists, however, the situation is quite different. Many of these jobs require highly educated individuals who possess deep, specialized technical skills or fluency in the native language of the population who will be using the speech technology, making it all but impossible to outsource the positions overseas. Because companies cannot outsource or find qualified workers in the U.S., positions remain unfilled or are filled by a handful of qualified consultants.

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Yet when qualified workers are hired, they seem to enjoy unprecedented job security. Even in 2008 and 2009, when most cutbacks were taking place, "I don't know of a single person who was laid off [in the speech recognition sector]," says Kevin Brown, chief architect of speech solutions at HP. Brown's observation emphasizes a problematic structural imbalance in the global economy caused by innovation outpacing the transfer of knowledge.

Technological unemployment, which also plays a role in the sluggish economic recovery, occurs when technology makes workers more efficient, obviating the need for as many workers. For example, prior to 1965, postal workers hand sorted all mail. As technology, including optical character recognition (OCR), was introduced (the Postal Service boasts that its OCR reads 93 percent of all hand-addressed letters), fewer postal workers were needed. In 2010, the Postal Service reduced its work hours by 75 million, the equivalent of 42,800 full-time employees.

With the shift from snail mail to email, postal workers continue to find themselves victims of technology. With email, delivery is immediate, there is no active handling of the email, and the sender can send a message to multiple recipients. Add to that the introduction of electronic bill pay systems and a mass aversion to junk mail, and it is not surprising that total mail volume decreased by 36.5 billion pieces from 2001 to 2010.

Companies including Pitney Bowes and Stamps.com are rapidly trying to adjust in an effort to survive the anticipated disappearance of the Postal Service. Pitney Bowes has been shifting from a postage equipment rental company to one that helps customers manage email marketing campaigns. Stamps.com, established in 1996, provides its customers with a way to print postage and labels without any specialized equipment. These companies, as well as Facebook, LinkedIn, and Constant Contact, are using technology to displace the United States Postal Service and along with it, thousands of postal workers. This dilemma emphasizes the challenge of having a pool of workers with nontransferable skills.

Another repercussion of the proliferation of personal technology is that the advent of the desktop printer did not save trees. In fact, personal technology solutions make it easier for people to print more paper. Similarly, scanners and email have increased the burden of job creation on business and governmental leaders. "It is a great irony that the advancement of technology, while extremely impactful and positive in many ways, has also caused a sizeable social hazard," says Andrew Springer, managing member of Resolve Capital, which invests in companies promoting sustainable solutions to environmental, health,

economic, and social problems. "Efficient does not always equal sustainable." *[Editor's note: Andrew Springer is related to the author.]*

There will likely always be people or situations that require transmission of messages by traditional mail or personal delivery, such as legal documents that require original signatures. In an effort to combat dwindling demand, the Postal Service is airing a television campaign touting the privacy and security benefits of traditional mail that are all but impossible to guarantee when sending email; a printed letter cannot get hacked or inadvertently delivered to the wrong recipient, at least not as easily as it can with email.

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Fewer people can justify having secretaries or assistants and, with cell phones and services like Google Voice that forward calls to any phone number, answering services are all but a thing of the past.

There will, however, likely always be a market for human interaction. While your doctor may have swapped his answering service for call forwarding, high-end customers expect and are willing to pay for personalized service. Some physicians offer their patients 24/7 availability, and companies like Time Warner Cable are distinguishing themselves from competitors by enabling customers to purchase around-the-clock access to personal representatives. Time Warner's offering may also serve the rollout of its anticipated new services in home security and smart appliance management.

The proliferation of technology has another danger as well. As mainstream markets become obsessed with the latest and greatest (in this case speech), we risk trading the exclusion of one group (people with upper extremity disabilities who use speech as assistive technology) for the exclusion of another (people who have difficulty speaking or who are unable to speak and therefore are poor candidates for using speech).

Do we really need to do everything by voice? Fifteen years ago, even 10 years ago, for people with disabilities, improvements in speech recognition couldn't get here fast enough, and they were virtually the only ones using speech. Now, with NaturallySpeaking for desktop dictation and virtual assistants like Siri and Vlingo, talk about the technology is being heard on all fronts, even prompting some experts in the speech industry to temper the public's expectations of using speech as the only method of communication. Speech recognition has its place, but it should not be overplayed. And it is not the right input device in all situations.

It's a slippery slope. Scanners put postal employees out of work but scanners also enable people who are blind to procure employment. Speech technology eliminates call center jobs but it also puts people with upper extremity disabilities into the workplace. Even if, or when, speech becomes the new normal, there are some people who will never be part of the "normal." Some people cannot speak, whether because the environment makes speaking inappropriate or because of organic causes such as cerebral palsy or traumatic brain injury. In creating technology that renders older processes obsolete, we still need to ensure redundancy in design or else risk bringing products to market that are not fully usable by the greatest number of people.

Brown, for one, does not see this as a problem. "Speech will be used to fill in the gaps," he says, explaining that "speech is just one user interface among many." People will seamlessly move among physical keyboards, touch keyboards, Swype, and speech. Essentially, the mode one uses for input will come down to who, what, where, and how: to whom the communication is being sent; what activities the author is engaging in while drafting the communication; where—in what environment—the author finds herself; and how accurate the author wants to be (i.e., while it may be okay to send a text message with typos to a family member, the same may not be true in professional interactions).

Whether it is OCR at the U.S. Postal Service or an ATM at a multinational bank, there is a disconnect between technology and economics. Although technology has been and will continue to be a key driver of innovation, helping many people function more effectively, industry leaders should also consider the social costs of these tools. ☒

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