Deloitte University Press

SIGNALS for strategists

The future of knowledge work

TWO important trends are changing the way knowledge work gets done in organizations:

1. The emergence of new ways of reaching and engaging workers

2. The automation of knowledge work by means of artificial intelligence and other technologies

Both trends have critical implications for business and are of particular importance to professional services firms.

New ways of reaching and engaging talent

Online talent marketplaces such as eLance and oDesk help employers identify workers with needed skills and engage them in project work. They allow workers to post their qualifications and employers to post their needs. These marketplaces, also known as talent clouds, facilitate communication and negotiation, handle payment, and allow employers to rate workers' performance. Workers develop an

online reputation through these rating systems, helping to guide employers in their choice of whom to engage. Millions of workers from around the world participate in online talent marketplaces, providing ready access to talent at a range of prices. oDesk reported that hours worked in its network increased 60 percent in 2012 over 2011, to 35 million hours.[1]

Today, talent clouds are commonly used to execute projects in information technology, design, marketing, and market research. But the range of skills available through these platforms is expanding; among the workers offering their services through such marketplaces are also translators, business analysts, and financial modelers. Some online talent marketplaces are supermarkets that represent talent across the professional spectrum. Others focus on a narrow set of specialties. ExpertBids.com, for instance, is a marketplace for legal, accounting, and consulting talent, with tax preparers and human resources consultants recently in high demand.[2]

Some firms are experimenting with creating private talent clouds. IBM is piloting the creation of a network of software developers who can execute discrete software engineering tasks. The initiative, the Liquid Challenge, was introduced in Germany around the time the firm announced a workforce reduction there, drawing negative commentary from the media. Nonetheless, IBM is a big believer in virtual organizations enabled by talent clouds. As IBM CEO Ginni Rometty recently put it, "The social network will be the new production line."[3]

Automating knowledge work

Another major trend is the growing use of technology to automate tasks typically performed by knowledge workers. Organizations are adopting a variety of technologies, collectively labeled artificial intelligence (AI), to automate knowledge work. As these technologies improve, increasingly sophisticated tasks can be automated. One AI technology, machine learning, can discover patterns and correlations in data; it can be used to guide the development of predictive models and analytics. Among the current applications of predictive analytics are:

- **E-discovery:** to accelerate the process of identifying relevant documents, improve completeness, and reduce litigation support costs by up to 90 percent[4]
- **Recruiting:** to discover the attributes of job candidates that predict good performance[5]
- **Venture capital investing:** to speed the investment decision process and, it is hoped, nudge investment returns higher[6]

Another AI technology helping to automate knowledge work is natural language processing. Siri, the automated assistant on iPhones that appears to understand and respond to spoken requests, is perhaps the most widely known example of this technology. IBM's Watson, which combines technologies for natural language processing, hypothesis generation, and evidence-based learning—all AI technologies—may have a greater impact on automating knowledge-intensive tasks ranging from medical diagnosis to responding to call center inquiries. In pilots with call centers, IBM found that it could reduce the amount of time operators spend looking for information to answer inquiries by half.[7]

The US military has long conducted research and development on AI and continues to find new applications for it. The Navy, for instance, is spending over $10 million to acquire and deploy AI technologies to "enhance, automate, and improve business processes, resource utilization, decision making, and interoperability" of some of its key systems, weapons, and activities.[8]

Software robots

Other technologies that automate IT-related services are emerging. Take the common situation in which an organization's business processes are conducted by means of multiple software applications that are not fully integrated. Workers may enter information into one system, for instance, then invoke a second system for the next step in the process, and so on. This "swivel-chair integration" is what startup Blue Prism replaces with automation. It allows business analysts with a few months' training to create software "robots" that can automatically perform tasks that humans swiveling between these systems used to do. Case studies have found that transaction time can be reduced by two-thirds over the time required for manual processing.[9]

Conclusion

New technologies are changing the way organizations acquire talent and get work done. Talent clouds make it possible to engage individuals anywhere in the world. AI and other technologies make it possible to automate knowledge work, saving time, reducing costs, and improving quality. These trends are anticipated to shape the future of knowledge work.

ATOMIZATION: SMALL TASKS AT LARGE SCALE

Atomization means breaking jobs down into microtasks that can be distributed to dozens, hundreds, or even thousands of workers in a process whose logistics and quality are managed by means of a web-based platform such as Amazon's Mechanical Turk, a specialized talent cloud. Companies use atomization when faced with large-scale jobs that can be decomposed into relatively simple tasks, such as tagging images with descriptive keywords. Automation could be used to conduct at least parts of the verification phase of an audit at greater speed and lower cost than conventional methods.

TopCoder, a talent marketplace for software development, algorithm design, and creative design, uses a form of atomization when it breaks down a client's programming challenge into small modules, each of which may require specialized skills possessed by some members of the TopCoder community. Members of the community compete to offer the best solution to a particular module.

Endnotes

1. "oDesk hourly billings jump," Staffing Industry Analysts, January 29, 2013, http://www.staffingindustry.com/Research-Publications/Daily-News/oDesk-Hourly-Billings-Jump-24463.
2. According to a recent email exchange with the founder.
3. Speech at Council on Foreign Relations, March 7, 2013.
4. "Why hire a lawyer? Computers are cheaper," *Wall Street Journal*, June 18, 2012, http://online.wsj.com/article/SB10001424052702303379204577472633591769336.html.
5. Joseph Walker, "Meet the new boss: big data companies trade in hunch-based hiring for computer modeling," *Wall Street Journal*, September 20, 2012, http://online.wsj.com/article/SB10000872396390443890304578006252019616768.html.
6. Jessica Leber, "An algorithm to pick startup winners," *MIT Technology Review*, July 9, 2012, http://www.technologyreview.com/news/428427/an-algorithm-to-pick-startup-winners/
7. James Rogers, "IBM CEO: We're widening Watson's reach," *The Street*, March 8, 2013, http://www.thestreet.com/story/11863743/1/ibm-ceo-were-widening-watsons-reach.html.
8. "A -- Intelligent Technologies for Decision Making," United States Department of the Navy, June 19, 2012, https://www.fbo.gov/notices/31bd689b530bfde26c38eb52753acee5, accessed June 14, 2013.
9. "Robotic automation emerges as a threat to traditional low-cost outsourcing," Blue Prism, http://www.blueprism.com/download_file.php?file=dl_40_1_hfs_1210_robotic_automation_emerges_a_threat.pdf, accessed June 14, 2013.

Contacts

Vikram Mahidhar
+1 617 437 2928
vmahidhar@deloitte.com

Vikram Mahidhar is a director in Deloitte LLP's innovation group. He focuses on identifying emerging business ideas and driving development and commercialization of emerging products and services.

David Schatsky
+1 646 582 5209
dschatsky@deloitte.com

David Schatsky is a senior manager with Deloitte LLP. His focus is analyzing emerging business and technology trends.

 Follow @DU_Press

Sign up for Deloitte University Press updates at DUPress.com.

About Deloitte University Press
Deloitte University Press publishes original articles, reports and periodicals that provide insights for businesses, the public sector and NGOs. Our goal is to draw upon research and experience from throughout our professional services organization, and that of coauthors in academia and business, to advance the conversation on a broad spectrum of topics of interest to executives and government leaders.

Deloitte University Press is an imprint of Deloitte Development LLC.