The Cognitive Computing Revolution

BY PETER SHANNON, CRE

Robots are no longer a fantasy from a science fiction movie. Forms of cognitive computing have become part of every day professional life — and are increasingly visible. "Hubo," the World Economic Forum's first robot delegate, debuted in January 2016. Six of IBM's "Watson" cognitive supercomputers work in the healthcare industry, giving healthcare professionals fast answers to complex medical questions. Beyond these high-profile robots, artificial intelligence has come to more ordinary businesses, too. Companies like Lowe's and Aloft Hotels are testing helpful robot prototypes. Limited-function robots are being used in factories and warehouses. Is your office the next frontier for a robot revolution?

The answer is a resounding "yes." In fact, robots are already at work in the modern office. Many workers are accustomed to having a quiet, unobtrusive virtual assistant that generates appointment reminders, designates email as "junk" or "not junk," or even adjusts the workspace temperature to a Goldilocks-like "just right." The virtual assistant is, in fact, a "cognitive computing" program — a virtual close cousin to the robots that science fiction once predicted would take over our world.

WHAT IS COGNITIVE COMPUTING?

A subset of artificial intelligence, cognitive computing is the technology behind the email filters that learn the user's preferences, the "inspired by your browsing history" displays on Amazon and the song-picking abilities of Pandora, the online music service. In these applications and others, the underlying software automatically learns individual user preferences and responds accordingly as it "gets to know" the consumer. While robots are traditionally physical machines, not just virtual, the technology that allows them to learn and act is the same.

Learning-capable cognitive software, along with other automation technologies, is already shaping both how and where companies choose to operate and how they design environments for productivity. Its disruptive power is shaping new business models and operating strategies, creating both opportunities and challenges for businesses in search of competitive advantage.

For corporate real estate teams, these technologies are inextricably linked to the size and shape of

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future strategies for their workplaces and real estate portfolios.

ON THE BRINK OF TECHNOLOGICAL REVOLUTION

Cognitive computing, robotics and automation feature prominently in most projections of the future workplace. In fact, the automated workplace became a major focus of the 2016 World Economic Forum (WEF) at Davos. As described in *The Fourth Industrial Revolution*, the landmark 2016 book by WEF founder and Executive Chairman Klaus Schwab, "We stand on the brink of a technological revolution that will fundamentally alter the way we live, work and relate to one another. In its scale, scope and complexity, the transformation will be unlike anything humankind has experienced before."[1]

The roots of the Fourth Industrial Revolution lie in the original Industrial Revolution that began with the 1770 invention of steam power and led to the transition from hand production to mechanized production with inventions such as the cotton gin, the steam engine and machine tools. The first Industrial Revolution was a major turning point in human history, on par with the domestication of animals — but its full realization evolved over decades.

The Second Industrial Revolution began around 1870 with large-scale iron and steel production, the invention of electric power and the internal combustion engine, and the enormous expansion of railroads and telegraph lines that accelerated the spread of people and ideas. Then, in the 1970s, the Third Industrial Revolution laid the groundwork for the Fourth by introducing electronics, computing and information technologies that further automated production and enhanced industrialization.

The Third Industrial Revolution introduced key concepts involving artificial intelligence, robotics and automation. The Fourth Industrial Revolution began with the emergence of the internet, connected devices, the Internet of Things (IoT), machine-to-machine communications and machine learning. What makes the Fourth Industrial Revolution distinct from previous eras is both the pace of transformation and the scale of its implications for business strategies and operations.

The migration from the simple digitization of Third Industrial Revolution to the advanced computing now available is forcing companies to reexamine the way they do business. The Fourth Industrial Revolution will be essentially shaped by cognitive computing and other related technologies — including innovative combinations of artificial intelligence, robotics, 3-D printing, nanotechnology, biotechnology, quantum computing, augmented and virtual reality and more. These interrelated advances are poised to transform how and where work is performed.

COMPUTERS THAT CAN LEARN AND THINK

In the 2020s and beyond, the Hubos and Watsons of the world will certainly become more visible in myriad workplaces — but they are only a small part of the picture. As noted above, today's robots are just as likely to be virtual, existing in the form of software programs that learn from their interactions with users and machines as computers become ever more intelligent. Their presence is already shaping workplace and corporate real estate, and is expected to continue to do so in both foreseeable and unpredictable ways.

As Schwab's book points out, the prospect of super-automation inevitably raises the specter of disruption and worker displacement. A 2016 World Economic Forum study predicts a net loss of 5.1 million jobs globally in the next five years as computers displace human workers. Over the next 10 to 20 years, the WEF estimates that 40 to 60 percent of the workforce that is now doing transactional work could be replaced and/or augmented by artificial intelligence, workforce automation and smart cognitive thinking machines.[2]

WHERE'S THE JOB LOSS?

The WEF anticipates the most job losses in office and administrative work, followed by manufacturing and production, with the most job gains to arise in business and financial operations; management; and computer and mathematics fields. Similarly, Gartner Inc. research suggests that software or robots will displace one in three jobs by 2025.[3]

Some estimates are much more conservative — for instance, an Organization for Economic Cooperation and Development (OECD) study found that only 9 percent of workers globally faced a high risk of being replaced by an automaton — but all point to at least some degree of job displacement from automation. OECD's data shows that workers in the Slovak

Republic, Czech Republic, Italy, Germany and Austria are the most vulnerable.[4]

Robots are already an established presence on many manufacturing floors, where the cost of the robot and its maintenance can be far less than the cost of an employee. More than 260,000 robots are working in U.S. factories, according to data from the Robotics Industry Association, with most working in the automotive, semiconductor and electronics industries.[5]

In the white-collar sector, the financial services industry has been among the first to embrace automation. A Citigroup report estimates that more than 1.8 million U.S. and European bank workers could lose their jobs within ten years.[6]

In some banks, for instance, algorithms already tackle tasks such as vetting banking clients, pricing assets and hedging some orders without human intervention. In equities, electronic trading has decimated the number of salespeople, traders and floor brokers, and has ushered in high-speed trading firms and alternative "dark pool" private exchanges.

Elsewhere, several innovative start-up companies are now offering software robots for auto-correspondence and other office functions. BodyLogicMD, a franchising company for hormone replacement therapy clinics, uses calligraphy robots produced by technology start-up Bond to send patients appointment reminder notes in a physician's own handwriting. The Grid.io uses an artificial intelligence robot to create customized websites for businesses that are updated with real-time analytics.

Innovators such as Nuance and Pandorabots provide artificial intelligence-driven "virtual agents" that can conduct live text or voice chats with customers to answer questions, suggest services or provide tutorials. Of perhaps greater concern is Automated Insights, a company that uses software to create syndicated earnings stories and sports stories for the *Associated Press* for use in newspapers around the world at an average cost of less than $8 per story.

THE NEXT-GENERATION WORKPLACE AND CORPORATE REAL ESTATE PORTFOLIO

On the corporate real estate front, new ways of working, collaborating and generating revenue will undoubtedly render some facilities and locations obsolete while creating demand for new kinds of workspaces. Companies may need to create specialized work environments for jobs that do not yet exist, in industries that have not yet begun to emerge. Meanwhile the ever-growing role of technology will require companies to make continuous investments in workplace technologies.

ON THE JOB: ROBOT COWORKERS

Although virtual workers may displace many office workers, a more likely scenario is that virtual or physical robots will work side-by-side with humans in complementary roles. Even the most intelligent software agent or robot cannot duplicate every capability of a human being — and that may always be the case. Although software or physical robots can rapidly apply algorithms to vast amounts of data, quickly search for keywords and phrases (a la Google) and accurately perform physical tasks at lightning speed, humans are vastly superior at visual and language recognition and using creativity, intuition, persuasion and imaginative problem solving.

In some industries, cognitive computing has the potential to free human workers for higher-level analysis, business strategies and customer engagement while cognitive software handles high-speed number-crunching, analytics and data searches. These roles will require the human workers to have decidedly higher business skill levels than previously, and organizations will have a different scale and mix of workers than today.

For example, customer contact centers adopted automation a long time ago, and now require fewer employees for basic services that a computer can handle or enable the customer the ability to self-perform the needed service. Today's higher-skilled positions require problem-solving ability and business acumen, along with greater social media and online chat skills.

In the office, as well as on the manufacturing floor, next-generation working will involve exponentially more human-to-machine collaboration, as companies tap data science to drive workplace performance and business value. Advanced cognitive technologies will further evolve and become integrated into the workplace to enable new levels of human and business performance.

BEYOND RENTS AND FLOORPLATES: DISRUPTING LOCATION DECISION-MAKING

In addition to changing how work is performed, computing advances are accelerating the pace of innovation. Today, new business models are rapidly taking shape to exploit automation and artificial intelligence, and the use of new technologies is enabling companies to launch new products and services in ever-shorter timelines. Already, the increased velocity of business requires companies to create real estate portfolios that are as nimble as their business strategies.

Recognizing that technology-driven disruption will impact workforce needs across many industries, many — if not most — organizations will need to rethink their real estate with an eye to future business models and talent requirements. Many companies are finding that their current locations no longer provide access to workers with the right skills and aptitude.

To succeed, a company will need a portfolio of operating locations that support business transformation and agility with greater access to target demographics, unique skill sets and industry innovation. Some forward-looking companies already are using cognitive computing itself to guide their real estate decisions beyond their staffing needs, with highly sophisticated, data-driven corporate real estate management strategies. A contemporary business intelligence platform can analyze thousands of portfolio data points in a few minutes — data that previously would have taken a group of people months or years to assemble.

With today's corporate real estate data and insights platforms, a company can consider site selection factors far beyond rents and floorplates. Using detailed data visualizations, a corporate real estate team can combine factors encompassing everything from the political environment and macroeconomic factors to demographics and quality-of-life factors to make real estate decisions that anticipate where their business might go. These factors can be integrated with portfolio data points, such as rental rates, lease expirations and market trends, to design portfolio strategies around the need for digitally savvy talent with specialized skills and business agility as technological disruption continues.

WORKERS, WORK ENVIRONMENTS — AND THE COGNITIVE COMPUTING IMPACT

Clearly, the cognitive computing revolution means that companies will need a different scale and mix of workers in the future than today, and a different mix of work environments. The change is likely to be felt in different ways by different workplaces in different industries. The reality is that no one can predict exactly what and where the impact of artificial intelligence and cognitive technologies is going to be.

What is evident is that robots, cognitive computing programs and other such technologies will provide new levels of efficiency, enhanced human-to-machine collaboration and new innovative machine-learning capabilities. These abilities will in turn drive business and financial performance. Corporate real estate executives need to consider how their companies will respond to these changes — and how their workplace and portfolio strategies can keep pace with the revolution. ■

ENDNOTES

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