

**FEATURES**

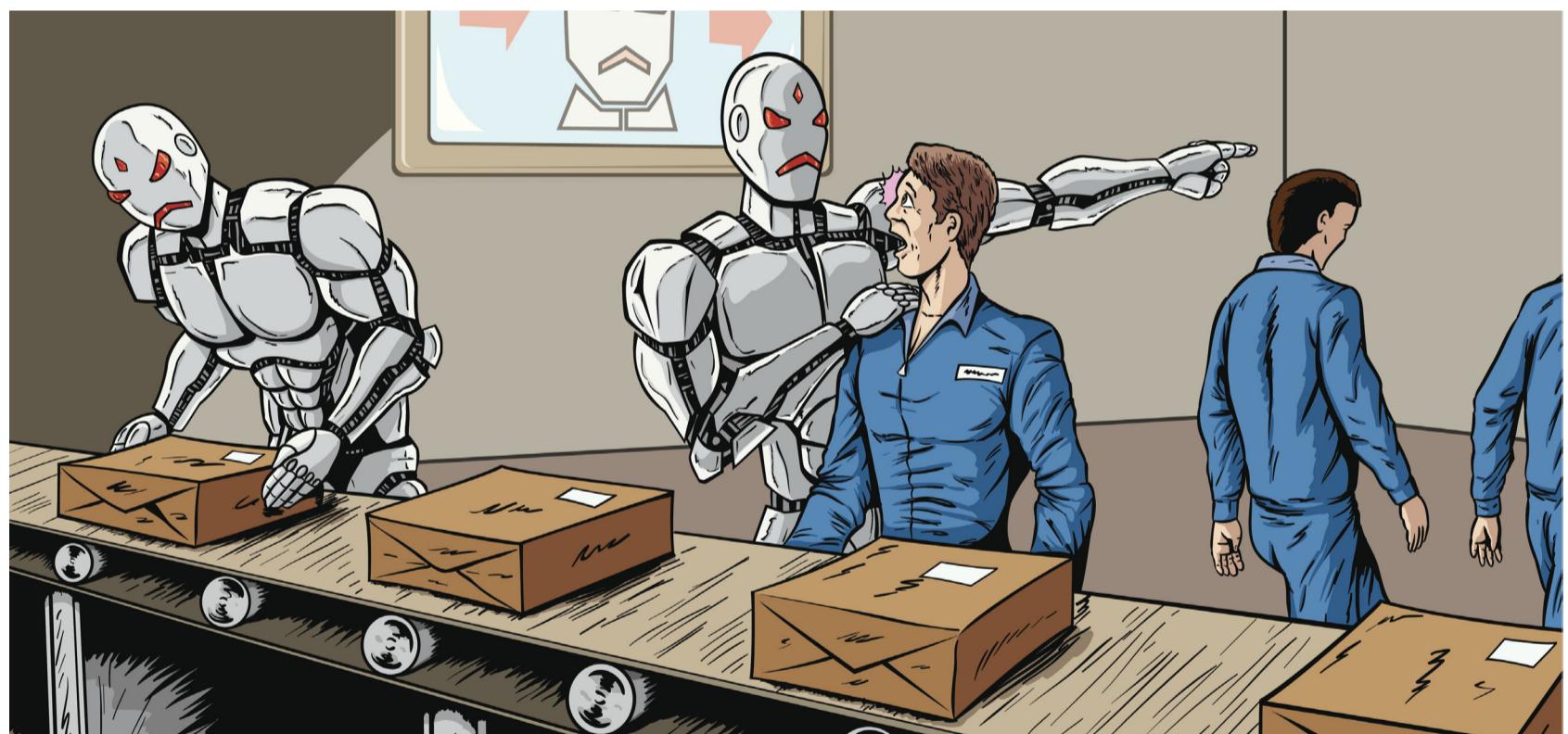
# ARTIFICIAL INTELLIGENCE **CREATES NEW JOB OPPORTUNITIES**

BY BEN DICKSON



**F**or the past several decades (at least), we've heard about the looming threat of technological unemployment—the takeover of human jobs by automation. But these days, it seems especially imminent. Case in point: When earlier this year, Treasury Secretary Steve Mnuchin dismissed the notion of robots putting humans out of jobs, the science and technology community responded with stats and charts that showed just how wrong that assessment was.

Artificial intelligence is finding its way into an ever-increasing number of domains, heralding an unprecedented disruption of the employment landscape. And neural networks and machine learning algorithms, the most prominent constituents of modern AI, are either promising or delivering better performance than human professionals. The AI revolution is coming at a fast pace, and it is as good a time as any to start preparing our educational and economic infrastructure for a future in which humans will become less and less involved in performing certain types of tasks.



"Clearly now, with computers starting to see, hear, and read, automation will experience unknown boosts," says Alex Linden, VP of Machine Learning Research at Gartner. "This still has to bear fruits. A lot of the recent developments will take a few years before material automation is starting to happen. But [in] many non-manufacturing domains... proofreaders, machine translation experts, and [people in other occupations] certainly have to fear for the jobs."

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This is not the entire picture, though. Every industrial revolution is as much about the displacement and adjustment of the workforce as it is about its replacement, and this newest cycle is no exception. But the propagation of artificial intelligence will also provide new opportunities to put human creativity and innovation to effective use.

## INCREASED DEMAND FOR TECH TALENT

“What we do know is that artificial intelligence will be most effective in the short term for jobs which can be broken down into a series of routines, whether that be manual labor or cognitive tasks,” says Joe Lobo, botmaster at artificial intelligence firm Inbenta. “This means humans will be able to concentrate on the more creative and consequently more enjoyable tasks.”

“Technology has never been a net destroyer of jobs,” says Stuart Frankel, CEO of Narrative Science. “Look at almost every technology job that exists in any enterprise today. None of those jobs existed twenty years ago, and most of them probably didn’t even exist ten years ago.”

For the moment, anyway, rather than being a total takeover of human jobs by robots, the problem is that there are a lot of vacant job posts and not enough skilled people to fill them. With the rise of data-driven business, the demand for tech talent is increasing across the board.

For instance, in 2016, cyber-economy researcher Cybersecurity Ventures reported that the cybersecurity unemployment rate was at zero—and that in fact, there’s a shortage of more than one million experts across the world. Similar tech-employment areas, such as software development and data science, aren’t faring any better and are dealing with their own talent gap. The need for more experts in tech jobs will continue to grow as artificial intelligence finds its way into even more domains.



**HELP WANTED**  
Recent years have seen a number of government-led projects as well as initiatives by the private sector to help fulfill the need for tech talent.

“I believe that governments should ensure that coding is valued as highly as English, math, and science, if we are to ensure that we can maximize this boom in opportunities that artificial intelligence will provide us,” Lobo says.

Recent years have seen a number of government-led projects as well as initiatives by the private sector to help fulfill the need for tech talent. Former President Barack Obama’s TechHire project is an example: It includes a \$100 million grant meant to pave the way for more people into tech jobs, including those who don’t have higher-education certifications.

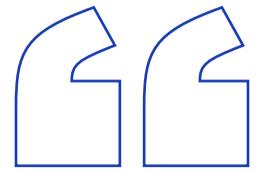
We’re also seeing the development of massive open online courses (MOOCs) from institutions such as Coursera and Big Data University—free online education for technical skills that are in high demand. Coding boot camps, institutions that teach applicants computer programming in a short amount of time, have also risen in popularity. At the same time, companies such as AT&T are helping their employees adapt to the future of employment.

As the pace of artificial intelligence development picks up, skill and expertise requirements will change just as rapidly. Not even software development will stay the same in the future and will shift from coding toward training AI algorithms.

## A REVOLUTION IN HUMAN-COMPUTER INTERACTION

Many of the people who are losing their jobs to AI do not have the skills and knowledge to enter tech jobs, and training them requires considerable time.

Fortunately, in this respect, artificial intelligence can help solve a problem that might be largely its own making. AI is already promising to revolutionize education in many ways, including personalizing and optimizing the learning experience. This means it'll take less time to learn new skills.



Where AI can't soften the learning curve, it'll be able to break down the complexity of tasks and make them simpler.



"Humans will be able to retrain into other industries quicker than ever before, giving them a maximum flexibility to react to the changes in the job market," Lobo says. "Why can't a truck driver be able to move into a career in coding within months?"

Where AI can't soften the learning curve, it'll be able to break down the complexity of tasks and make them simpler, enabling more people to enter jobs that once required years of education and training.

One noteworthy development is Natural Language Processing and Generation (NLP/NLG), the branch of artificial intelligence that has to do with understanding and producing human language scripts. NLP and NLG are redefining the way we interact with computers, removing hurdles and barriers to perform tasks and making us much more efficient at our jobs.

“NLG is an enabling and augmentation technology,” says Narrative Science’s Frankel. “When combined with human skills, NLG can produce results that far exceed what either group could achieve alone. I think Excel is a great analogy to NLG. When Lotus 123 and Excel first came out, there were lots of dire predictions about the future of accountants and financial analysts, but we quickly learned that these tools weren’t going to replace analysts. In fact, the analysts turned into super analysts and businesses started hiring them in droves. The same thing is happening with NLG.”

Narrative Science integrates NLG into business intelligence (BI) platforms to provide users with Intelligent Narratives, insightful, conversational communications packed with audience-relevant information that provide complete transparency into how analytic decisions are made. The technology, Frankel explains, is helping enable a broader group of people to do their jobs without requiring a specialized set of skills such as data science.

“This means less technical folks or people at any analytical skillset can use these BI tools, instantly get the insights they need, and ultimately, do their jobs better,” he says.

NLP, on the other hand, makes it much easier for people to interface with analytics tools and data sources. You can already see this in platforms such as IBM Watson Analytics, where natural language commands are making it easier to query data sources. This can pave the way for people with mathematical skills to enter data science jobs without having to go through lengthy programming courses.

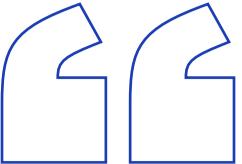
NLP is also helping make sense of large corpuses of unstructured knowledge, including articles, books, and whitepapers, organizing them into data that is queryable and usable by machines. This can make software and services much more efficient at helping human experts.

Alex Linden, the researcher at Gartner, believes this can help create more efficient knowledge graphs—loosely structured data repositories that power AI engines. “AI/NLP can help create a real knowledge industry,” he says. But he adds, “We are still in its absolute infancy.”

## COMPLEMENTING HUMAN EFFORTS

An example is IBM’s recently launched AI-based Watson for Cybersecurity platform. Watson uses machine learning algorithms to sift through tons of structured and unstructured data. It then “learns” about recurring and emerging threats and helps security analysts to perform their jobs. Caleb Barlow, VP of IBM Security, thinks of Watson’s role like that of a paramedic helping a physician. This can make it much easier for analysts with less skill and experience to become more proficient at dealing with security incidents.

Tech is not the only sector where AI can complement human efforts and put more people into jobs. Artificial intelligence algorithms are also showing promise in the fields of healthcare and medicine, which are chronically short of physicians and skilled workers. Neural networks and AI assistants are making it much easier to detect, diagnose, and treat illnesses, cutting down the time required to train doctors, and making healthcare services accessible to many more people.



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### IBM'S WATSON

Watson sifts through tons of structured and unstructured data. It then “learns” about threats and helps security analysts to perform their jobs.

“There is a shortage of doctors, nurses and physician assistants in the U.S., and there is an even more acute need outside the developed world,” Frankel says. “You think about all the things that AI can do—take massive amounts of data, analyze it, communicate the most important points—and it widens the availability of many services that could only be done by people with extensive (and usually expensive) training. You still need people to work hands-on with patients. AI is enabling more people to do so because it is making knowledge more accessible. In this way, I think AI will actually create more jobs.”

Eventually, the development of artificial intelligence will create job opportunities for experts beyond the traditional tech-related domains. Data science author and LinkedIn Learning instructor Doug Rose believes that the industry needs to onboard other skills as well.

“The last half-century has been a boon for quantitative fields. Computer programmers, engineers and data scientists have dominated the job market and created massive companies,” Rose says. “Yet, some of the key challenges with AI are much different from software. Here the greatest challenge will be creating a better human experience.”

As it takes on increasingly complicated tasks, artificial intelligence faces social, ethical, and political challenges. Engineers are dealing with totally new problems, such as creating unbiased AI algorithms.



“Right now [artificial intelligence] is the domain of academics, engineers, and software developers,” Rose says. “Eventually the field will demand a different set of skills. It’ll require people with a strong background in the humanities. The key to a better human experience will come from philosophy, cultural studies, rhetoric, languages and the arts. These specialists will be the guides who help bridge the gap between the software and our essential human needs.”

Rose has elaborated on the topic in an essay, “Who Will Teach Our Machines Right From Wrong?” in which he explains why there needs to be a seat for our anthropologists, communication specialists, philosophers, and cultural experts.

Inbenta is a company that employs linguists to develop the lexicon for its search solutions, ensuring they are robust and can provide high service rates to its customers.

“Linguistic students are generally expected to move into careers within teaching or translating, but we have seen their market start to change, thanks to AI,” Inbenta’s Lobo says. “The next few years will see similar roles that we cannot currently comprehend spring up for people who may be concerned that the skills they have acquired could become antiquated.”

Until the day robots take all the jobs, there’s still plenty for humans to do. If we can embrace change and prepare for it, we’ll have plenty of career choices.

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