

THE FUTURE IS AUTONOMOUS

Autonomous agents—powered by AI—are transforming society one service at a time.

BY DAVID BAUM



We have met the robots, and they don't look anything like us. Despite the android-driven future portrayed in popular science fiction books and films, today's autonomous agents rarely take on a humanoid form. They are much more likely to be embedded in the systems and devices we use every day—or not take a physical form at all. At home, intelligent assistants such as Amazon Alexa and Apple Siri are incarnated in innocuous tabletop devices—or simply as the voice in your phone. The industrialized world is witnessing the advent of robots and autonomous technologies in cars, tractors, factories, planes, power grids, warehouses, and airports, all of which depend on intelligent software systems to streamline repetitive tasks and make autonomous decisions.

Not only are these autonomous agents getting smarter, but the ways in which we interface with them are also becoming more natural—and pervasive. For example, when package delivery firm Hermes needed more bandwidth to field a rising volume of customer service inquiries during a busy holiday period, the UK company created a software bot named Holly to help its call center staff shoulder the load. Today, the AI-powered chatbot helps customers track shipments, change delivery orders, update

account preferences, and handle many other essential tasks—quickly and efficiently.

“Scaling the business for seven or eight weeks of the year to handle roughly double the volume of packages is a significant challenge,” says Chris White, director of customer experience at Hermes. “It’s more efficient for us to deal with a digital channel than it is to deal with a voice channel, and Holly has started to take up the weight of our chat volume. The bot is very good at dealing with basic interactions.”

It’s a sign of the times: Motivated by growing customer transaction volumes and a steady rise in the use of messaging and chat applications, many companies are developing digital assistants to help with routine customer service tasks. By the end of 2019, Forrester predicts, autonomous technologies will eliminate 20 percent of all service desk interactions. Powered by AI systems, intelligent bots such as Holly can streamline customer service and lighten the load in the call center.

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THE AGE OF UBIQUITY

Ubiquitous call centers and help desks are just the beginning. In the commercial world, we are witnessing the advent of intelligent software systems in cars, consumer appliances, and many other domains—animated by a steady stream of data. The most-advanced bots use machine learning technology to analyze that data and learn from experience—to sense their world and assess moment-to-moment conditions.

For example, sensors embedded in road systems send information to cars and road operators about road construction, traffic snarls, and weather alerts

to improve safety, reduce congestion, and improve fuel efficiency—creating a whole new economic value chain. Several automotive manufacturers have released driver assistance systems that can use this data in conjunction with robotic systems that control steering and acceleration, including Mercedes-Benz Drive Pilot, Cadillac Super Cruise, Volvo Pilot Assist, and Tesla Autopilot. They are not fully autonomous—these vehicles all require a human presence in the driver’s seat for the autonomous system to function. However, Panasonic, a company immersed in autonomous and AI technol-

ogies, predicts that by 2030, 15 percent of all new cars sold could be fully autonomous.

We're also seeing a steady rise of autonomous technologies within public transportation, driven by a growing propensity to use ride-pooling and car-sharing. Mercedes has released the URBANETIC concept car, which is designed to carry passengers during the day and deliver goods at night. According to the manufacturer, the vehicle includes a self-learning infrastructure that can continually analyze transportation needs. For instance, it can use the data captured by the vehicle control center to identify a crowd of people gathering in a certain area and then send a vehicle there to meet demand.

THE AUTONOMOUS ENTERPRISE

Chuck Hollis, senior vice president of cloud infrastructure at Oracle, believes that the true potential of machine learning and autonomous computing involves improving day-to-day business decisions such as how to price

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products, recognize fraud, and circumvent customer churn. He coined the term *autonomous enterprise* to describe organizations where many decisions are made with the help of machine learning models. Particularly when these decisions involve analyzing data and identifying patterns, Hollis says, machines are often more accurate and efficient than a human can ever be. “The decisions most of us make at work all day long are based on past experiences,” he states. “It is precisely those types of decisions that will be most amenable to machine learning and to situations where people

make decisions with the help of intelligent machines.”

Hollis believes that artificial intelligence is one of those transformational technologies that, like mobile computing and the internet, have forever changed the course of business. Just as mobile technologies have made us better at connecting and communicating, machine learning is enabling faster, more accurate decisions.

According to De’Onn Griffin, research director at Gartner, CIOs need to prepare for the “killer combo” of people plus technology during the next 10 years. The digital component of most jobs will accelerate, she predicts, put-

ting an emphasis on “digital dexterity” within the workforce—that is, the ability to use technology for better business outcomes.

“I would love to get to the point where, using Holly and other technologies, we could inform consumers and manage their expectations before problems occur—and before they even contact us,” White says. “That’s my ultimate goal—to use Holly with data from our CRM system to get in front of problems, so we can do a more effective job of managing consumer expectations and resolving tricky situations.”

THE FUTURE OF WORK

Although some workers fear a future in which artificial intelligence and machine learning make the current workforce obsolete, history suggests otherwise. According to Byron Reese, futurist, researcher, and author of *The Fourth Age: Smart Robots, Conscious Computers, and the Future of Humanity* (Atria Books, 2018), the half-life of a job in a modern economy is about 50 years. For example, in the US

HOW TO PREPARE FOR THE AUTONOMOUS FUTURE

Autonomous technology is worthless if it doesn’t yield more-productive ways to develop business applications; gain predictive insights; or run smarter, more efficient, and more secure operations. Here are five guidelines to keep your enterprise on the right road.

from 1900 to 1950, half of all jobs vanished, mostly in farming. From 1950 to 2000, another half were lost, many in manufacturing. Most of this disruption was caused by technology—which, Reese maintains, tends to create new jobs as quickly as it elim-

- 1. Learn to use all your data.** The better you are at integrating vast amounts of data, the better your autonomous systems will be at delivering smart, timely outcomes.
- 2. Make recommendations easy to consume.** To speed adoption, recommendations must be delivered at the point of decision—ideally in the context of everyday business processes.
- 3. Emphasize transparency and control.** To reassure workers and minimize risk, AI systems must be transparent and account-

- 4. Connect rather than isolate.** Enterprise decision-making often crosses boundaries by connecting insights from multiple functions. This is the road from narrow AI to “big picture” use cases.
- 5. Leverage existing systems.** Few companies have the luxury of starting these endeavors from scratch, which means that you need flexible and extensible AI technology that can work with what you already have.

inates old ones. “By lowering costs and increasing quality, automation invites higher production, which creates new jobs,” he explains. “Companies continue to need more people, because technology allows them to do more, sell more, and expand faster.”

As Reese points out, replacing animal power with steam power took approximately 20 years. Electrification of industry took only 7 years. Yet neither of these advances substantially impacted the unemployment rate on a prolonged basis—rather, they boosted productivity and ushered in new eras of prosperity. “Technology makes new jobs at the high end and destroys them at the low end,” he continues. “In a thousand different ways, we have made our workplaces vastly more efficient.”

To cite a more modern example, while language translation programs such as Google Translate are quickly eliminating complex translation jobs, these programs are simultaneously creating new business opportunities by removing language barriers and making it easy for people to operate in other countries.

Reese explains the impact: Introducing efficiencies in an industry tends to lower costs or increase quality—both of which invite higher production, which creates jobs. “Our long-term goal

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as a species should be to build machines to do the mundane and repetitive jobs, so that there are more people to do the jobs that only people can do,” he adds. “It will be hard, if not impossible, for computers to be able to do jobs that require creativity or abstract thinking, because we don’t really even understand how humans do these things.”

KEEPING TECH IN CHECK

Although many industry pundits are enthusiastic about the potential of AI and autonomous technologies, some are concerned about the undue influence afforded to companies and agencies with the biggest computers and the most-complete

datasets. For example, virtual reality pioneer Jaron Lanier sounds a cautionary note in his book *Who Owns the Future?* (Simon & Shuster, 2013). In the past, Lanier points out, organizations gained power and influence by controlling the things that society needs, such as oil and transportation routes. Now that power often rests with the organizations that have superior information and the most-massive computer networks—buoyed by the widespread complicity of people who willingly share their personal data.

Despite these warnings, it’s clear that autonomous technology will continue to offer immense benefits to society. And as data

continues to gain value, some of the most important advancements will come in the form of smarter database management systems.

For example, an autonomous database can gradually learn to distinguish normal from abnormal behavior—a capability known as *adaptive response*—and to automatically detect and fix problems. If the database suspects that legitimate account credentials have been hijacked or compromised, it can take action to lock out that user or minimize the impact of a security breach—as well as escalate issues to a human agent to intervene as necessary.

Already, self-securing and self-repairing capabilities help cybersecurity professionals stay ahead of persistent attacks on corporate datasources, and machine learning algorithms streamline diagnostics, capacity planning, operational forecasting, and business analytics. According to Hollis, attaining this type of automated security posture was a guiding force behind the development of Oracle Autonomous Database, a foundational component of the

autonomous enterprise.

Oracle is also infusing artificial intelligence into its enterprise resource planning, supply chain management, customer experience, human capital management, and other SaaS apps. At the platform layer, Oracle is adding autonomous capabilities not only to its Oracle Database instances but also to its analytics applications and management utilities. All of this software is layered on an intelligent cloud infrastructure and informed by Oracle Data Cloud—the world’s largest marketplace of third-party data.

Oracle has also created development tools that enable customers to create their own AI-enabled applications. For example, to create Holly, Hermes used Oracle Digital Assistant, a platform and set of tools for building AI-powered assistants. Hermes integrated its Holly chatbot with Oracle Service Cloud and is establishing an interface to Facebook Messenger. All of Hermes’ data is stored in Oracle Database, which will soon be migrated to Oracle Cloud.

Hollis sees special potential in “augmented analytics,” which involves using AI bots to explain data correlations in simple language—along with an interface that enables users to investigate further. For example, if a revenue report reveals a downward trend, you might ask a bot to show you the three top reasons sales are down this quarter.

“Autonomous technologies play an increasingly crucial role in making business technology more innovative and development teams more productive,” he concludes. “An autonomous cloud platform can transform your IT operation—and your entire business—as the linchpin of a larger digital transformation initiative.” □

David Baum is a freelance writer focused on the intersection of business, technology, and culture.

ACTION ITEM

■ [What is an autonomous database?](#)