

AI Agents

AI agents are poised to transform how enterprises deploy automation and intelligent systems to increase productivity and streamline operations.

Unlike previous types of AI tools—assistants, chatbots—which operate on a single-task basis, agentic AI systems can autonomously plan, reason and execute complex tasks with minimal human intervention. Agentic AI's unique ability to call on external tools to complete complicated directives, and to collaborate with other agents and technologies, has been widely heralded as an opportunity to fully realize AI's potential for reshaping the business landscape.^{1 2}

Leading businesses have begun to integrate AI agents and systems into everyday real-world operations. These **artificial intelligence**-powered “digital workers” can be particularly effective in streamlining **customer support**, optimizing supply chains, supporting human agents in marketing and sales departments, improving the employee experience and analyzing data from the financial and healthcare industries.

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How do AI agents work?

Agentic AI is based primarily on **large language models** (LLMs). Where traditional LLMs produced outputs based solely on the data used to train them and possessed limited reasoning abilities, AI agents are empowered to call on additional tools and **APIs** to meet more difficult goals. Agentic AI can autonomously obtain current data, optimize **workflows** and create subtasks based on its objectives. With advancements in gen AI and **conversational AI** technology, some agents interact with their human counterparts in natural language. And unlike previous LLMs or chatbots, AI agents store memory from one interaction to the other, improving reasoning power and accuracy over time.

Generally, AI agents are most useful when developed as part of a network. There are five central types of AI agents with varying levels of complexity. They are:

- **Simple reflex agents**, which perform based on a single set of rules. They do not hold memory or query other agents if they're missing information.
- **Model-based reflex agents**, which complete specific tasks based on a single set of rules but retains memory. A model-based reflex agent updates its model as it receives new information.
- **Goal-based agents**. which call on external tools to plan and execute a pre-defined specific goal.
- **Utility-based agents**, which call on external tools to select a series of actions to reach a goal as well as a pre-defined utility for that goal, such as a time requirement.
- **Learning agents**, which possess similar capabilities to other types of agents but have a unique capacity to learn. New inputs are continuously added to their knowledge base autonomously.

AI agent use cases

Agriculture

AI agents can help farmers increase yield while reducing waste. The technology is capable of independently monitoring weather forecasts and soil conditions to optimize planting schedules and soil conditions. By continuously learning from environmental data and other inputs, AI agents help farmers make sustainable and cost-effective decisions to improve productivity. For example Blue River Technology, a subsidiary of John Deere, uses an autonomous, [AI-driven robotics platform](#) to recognize plants and spray them with herbicides and fertilizers. This allows agricultural workers to optimize their resources for both cost savings and broader environmental sustainability.

Banking and financial services

According to the World Economic Forum, agentic AI is poised to define a “[transformative era](#)” for finance. The technology’s ability to act dynamically in fast-paced, data-heavy settings shows great promise for the industry. The technology can be used to improve decision-making, optimize workflows and enhance compliance.

For instance, autonomous AI is used to perform continuous, autonomous risk audits to detect unusual patterns and respond to emerging threats. Using similar logic, it’s well-positioned to assist with compliance monitoring and loan underwriting, both of which involve a high volume of data-intensive repetitive tasks.

On the customer-facing side, AI agents and agentic virtual assistants provide AI-driven financial advisory services: For instance, by automating certain wealth management activities or crafting investment strategies based on market conditions and individual risk tolerance. By using AI solutions for financial management, enterprises [mitigate potential disruptions](#) and leverage data to maximize value as well as increasing operational efficiency.

Content creation

Agentic AI, combined with generative AI, has the capacity to autonomously create articles, blogs, scripts and reports tailored to specific audiences and objectives. AI-powered design agents can additionally produce branded visuals or social media assets with minimal human input. In video and audio production similar tools can edit footage or synthesize voiceovers.

Unlike previous AI tools, which relied on direct and continuous human input, agentic AI allows creators to scale content output rapidly with minimal human oversight, maintaining quality and consistency throughout. For example, the Associated Press uses AI to generate basic news articles on data-driven topics like sports scores or financial reports, increasing the volume of content production and reducing human workloads.

Customer experience

Given sharply rising customer expectations, and high levels of burnout among customer service representatives, AI agents can be particularly useful applied to **customer experience**. With their **ability to improve responses over time** and recall relevant customer data in real-time, agents deliver deeply contextual and hyper-personalized experiences.

Unlike traditional chatbots, which respond to customer inquiries based on predefined scripts, agentic AI can anticipate future events and take proactive action based on customer needs, increasing relevance and customer satisfaction. Equipped with **natural language processing** (NLP), conversational **AI assistants** engage in natural, dynamic conversations with customers, automatically escalating complex issues to human representatives when necessary. Using sentiment analysis, these tools also analyze customer interactions to identify problems before they arise—or even offer and execute solutions such as issuing a support ticket or refund.

Agents can act as support systems for customer service representatives, as well, organizing and retrieving relevant customer data or helping troubleshoot product issues based on customer queries. Given agents' ability to interact with several systems simultaneously and retain customer data over time, they're particularly adept at providing highly personalized and proactive support. Using agentic AI in these settings leads to improved customer satisfaction by increasing accuracy and often leads to cost savings as the need for human interaction is reduced.

Disaster response

In disaster scenarios, AI agents can provide real-time intelligence and decision-making support for first responders. These systems analyze satellite imagery, sensor networks and social media to assess damage and prioritize emergency response efforts. Predictive models and simulations also help localities prepare for future events. Tools like these can enable proactive evacuations and minimize casualties, saving lives and reducing disaster response costs.

Education

AI tutors and learning platforms provide personalized and scalable learning paths for individual students. AI-powered mentoring agents assess a student's level of knowledge, track their progress and adapt content in real-time, ensuring all learners receive appropriately paced instruction. These agents can independently generate exercises and give feedback as well as explain context when students struggle with certain concepts. They're also useful in responding to, and learning from, students' **divergent learning styles**.

In higher education, AI research assistants can help students explore topics by gathering sources or summarizing information.

Additionally, language learning apps and career training platforms increasingly integrate autonomous agents that simulate real-world interactions such as job interviews, or foreign-language conversations. These tailored experiences can lower the barriers to creating engaging simulations and give a greater number of students the opportunity to practice real-world skills.³ Together, these tools have the potential to transform education into a more interactive, continuously evolving experience—resulting in increased student engagement and improved learning outcomes.

Energy management

AI agents can play a critical role in the energy sector by enabling intelligent grid management and predictive maintenance. For example, agents might proactively analyze data from energy equipment to predict maintenance schedules or foresee infrastructural failure. They can also autonomously balance energy supply and demand, adjusting grid operations in real-time.⁴ These task-based agents are capable of lowering an enterprise's carbon footprint and significantly reducing energy costs.

Healthcare

AI solutions have been [of particular interest](#) to the healthcare industry in recent years given their ability to autonomously investigate health data and remove administrative burdens in busy medical institutions. In clinical settings, AI agents given access to large datasets from across departments can significantly impact time spent on administrative tasks such as billing, scheduling and resource allocation—as well as completely automate routine tasks such as prior authorizations and remote patient monitoring.

Given their proactive approach to data analysis, AI agents can also help in diagnostics, manage drug processes and monitor patient vitals in real-time, flagging potential health risks before they escalate. By integrating agentic AI into everyday operations, hospitals and medical centers are able to make more informed decisions, allowing providers more time to focus on high-touch, personal care. These tools also lead to more accurate diagnosis, highly personalized treatment plans and faster research-based innovations.

Human resources

[HR-focused AI agents](#) can reduce administrative burden for human resources departments and significantly improve the employee experience. In the hiring process, these tools can perform a number of time-consuming tasks including resume analysis, candidate ranking and interview scheduling. Once a candidate is hired, personalized onboarding experiences tailored by AI provide new employees with individual training schedules and plans.

For current employees, agentic AI assistants can provide a number of critical resources to the workforce, including personalized training recommendations based on role, experience or career goals. Meanwhile, these autonomous systems also handle administrative requests like responding to employees' FAQs, managing leave requests and ensuring compliance.

For example: IBM's AskHR [fully automates](#) over 80 common HR requests, significantly increasing the time HR leaders can spend championing the employee experience and engaging in more nuanced, creative tasks. And, using AI for talent management, HR leaders gain insights into the factors driving

successful long-term hires [using data analysis](#). Using such agentic AI solutions, HR leaders save time and money through the recruitment and talent management process, as well as standardizing the hiring and promotion process using unbiased, data-driven input.

IT and process automation

Intelligent agents in IT operations autonomously manage infrastructure, detect anomalies, and optimize system performance, reducing downtime and operational risks. Agents can also act as assistants to developers, continuously monitoring a system's health, troubleshooting and deploying fixes autonomously. Agents programmed to increase cybersecurity can detect threats in real-time, taking proactive measures to prevent attacks.

And, increasingly, agents act as developer tools to assist programmers. For example, NASA engineers recently launched [an agent](#) for use in the Jet Propulsion Laboratory. The agent, which interacts with specific robotics system languages, helps robot developers inspect, diagnose and operate robots using natural language prompts.

Marketing

AI agents have a variety of applications in marketing, particularly given the vast amounts of data marketing departments ingest on a daily basis—and how many competing offers customers encounter. Today, some agentic AI tools are transforming the product discovery process as consumers [ask agents for shopping advice](#) rather than searching online themselves.

In marketing and e-commerce, AI agents can autonomously perform a number of communications and advertising tasks. This might involve managing campaigns, creating customer personas, personalizing content and optimizing ad performance in real-time. While previous [automation](#) and AI technologies could manage these tasks, they depended on much more oversight and frequent user inputs to effectively perform.

Using predictive analytics, AI agents can analyze customer behavior to identify the best times or messaging strategies for a given campaign automatically, then pass that information off to agents who could schedule the communications themselves. And with proactive analysis, these technologies continuously create robust customer personas based on vast troves of data, providing additional insights for marketing campaigns.

Social media AI chatbots can monitor a brand's mentions, engage with users and generate relevant responses more accurately than their non-agentic forebearers. Additionally, agentic AI providing customers with product recommendations can pull from a number of tools, datasets or previous user behaviors to more accurately identify their needs: For instance, by suggesting vacation bookings tailored to multiple people's travel preferences and external factors such as the weather.

Mental health support

AI agents offer personalized and accessible mental health support. For example, agentic therapy chatbots provide 24/7 assistance through conversations in natural language, helping users manage anxiety or stress with evidence-based techniques like cognitive behavioral therapy.

By blending emotional intelligence with continuous availability, agentic AI expands access to mental health support in a way that is scalable and private. Such conversational agents can reduce the burden on human professionals during employee shortages, expand access in areas where mental health

support is not readily available and help reticent patients reach out for support without a fear of stigma.⁵

Retail

AI agents offer personalized shopping experiences by recommending products, predicting trends, managing inventory and powering autonomous customer service chatbots. Intelligent merchandising agents can optimize pricing and inventory levels in real-time based on customer behavior and demand forecasts, preventing stock-outs or other interruptions.

In e-commerce AI agents curate product selections and promotions tailored to individual customer preferences and purchase histories—or even call on contextual data such as weather, location and current trends to improve results. In some brick-and-mortar stores AI agents are used to scan shelves and manage inventory in real-time.⁶ These technologies boost sales, reduce inventory issues and increase sales through targeted marketing, leading to increased customer satisfaction and higher conversion rates.

Sales

AI agent can be [used across the sales process](#), but have often been deployed to automate tasks and streamline access to customer data. Typically, agentic AI embeds deeply into existing tools like customer relationship management (CRM) software to access customer data like previous interactions and consumer preferences. Agents can assist in the lead-generation and qualification process, scoring potential leads and prioritizing follow-ups with customers most likely to convert.

In the lead nurturing process, AI agents autonomously communicate with potential customers through email, chatbots or voice assistants to provide personalized pitches and answer questions. These agents' ability to store prospective client data and handle multiple leads simultaneously makes them particularly easy to scale. And, given access to historical data, these tools forecast trends and potential sales opportunities, allowing sales teams to make [data-driven decisions](#) and allocate resources most effectively.

Internally, AI agents can be a great asset to sales teams: By transcribing and analyzing sales calls, surfacing relevant lead data prior to a meeting or helping sales agents schedule meetings. By providing real-time feedback to sales departments, AI agents help their human counterparts continuously improve performance.

Supply chain management

One of the central advantages of agentic AI over traditional models is its ability to act dynamically, analyzing data and modifying tasks without human instruction in real-time. This makes the technology particularly well-suited to the [supply chain, inventory management](#) and procurement process. [AI agents can streamline the supplier selection process](#), evaluating potential suppliers based on their cost-effectiveness or sustainability metrics as well as flagging potential risks. The technology also automates processes like contracting and purchase ordering, reducing manual effort and ensuring accuracy in supplier management. Agents' ability to cross-reference these processes against criteria like inventory levels adds an extra level of verification to the procurement process, preventing disruptions.

When data is centralized, agentic AI provides valuable insights, allowing enterprises to make more accurate decisions in both the short- and long-term. Agents can create detailed spend analysis and identify opportunities to cut costs, or forecast demand based on a number of factors including market conditions and global events. The technology can also be a critical compliance management tool, proactively monitoring transactions and internal processes based on an organization's specific regulatory environment.

By integrating agentic AI into the supply chain and logistics process, businesses make more accurate decisions about vendors and streamline the contracting process, reducing errors and bringing down costs.

Transportation and logistics

AI agents can autonomously optimize the transportation and logistics process by managing vehicle fleets, delivery routes and logistics on a large scale. Some delivery companies use autonomous dispatching agents to assign and reroute vehicles based on traffic, weather or the urgency of particular orders. Predictive maintenance systems detect vehicle issues to prevent unnecessary break-downs or wear, while intelligent routing systems reduce fuel consumption and shorten delivery timelines. These tools increase cost savings and help organizations meet their sustainability goals.