

Title: Agentic AI - Wikipedia

URL: https://en.wikipedia.org/wiki/Agentic_AI

Agentic AI is a class of artificial intelligence that focuses on autonomous systems that can make decisions and perform tasks without human intervention. The independent systems automatically respond to conditions, to produce process results. The field is closely linked to agentic automation, also known as agent-based process management systems, when applied to process automation. Applications include software development, customer support, cybersecurity and business intelligence. The core concept of agentic AI is the use of AI agents to perform automated tasks but without human intervention.[1] While robotic process automation (RPA) and AI agents can be programmed to automate specific tasks or support rule-based decisions, the rules are usually fixed.[2] Agentic AI operates independently, making decisions through continuous learning and analysis of external data and complex data sets.[3] Functioning agents can require various AI techniques, such as natural language processing, machine learning (ML), and computer vision, depending on the environment.[1] Particularly, reinforcement learning (RL) is essential in assisting agentic AI in making self-directed choices by supporting agents in learning best actions through the trial-and-error method. Agents using RL continuously to explore their surroundings will be given rewards or punishment for their actions, which refines their decision-making capability over time. All the while deep learning, as opposed to rule-based methods, supports agentic AI through multi-layered neural networks to learn features from extensive and complex sets of data. RL combined with deep learning thus supports the use of AI agents to adjust dynamically, optimize procedures, and engage in complex behaviors with limited control from humans.[citation needed] Some scholars trace the conceptual roots of agentic AI to Alan Turing's mid-20th century work with machine intelligence and Norbert Wiener's work on feedback systems.[4] The term agent-based process management system was used as far back as 1998 to describe the concept of using autonomous agents for business process management.[5] The psychological principle of agency was also discussed in the 2008 work of sociologist Albert Bandura, who studied how humans can shape their environments.[6] This research would shape how humans modeled and developed artificial intelligence agents.[7] Some additional milestones of agentic AI include IBM's Deep Blue, demonstrating how agency could work within a confined domain, advances in machine learning in the 2000s, AI being integrated into robotics, and the rise of generative AI such as OpenAI's GPT models and Salesforce's Agentforce platform.[4][8] In the last decade, significant advances in AI have spurred the development of agentic AI. Breakthroughs in deep learning, reinforcement learning, and neural networks allowed AI systems to learn on their own and make decisions with minimal human guidance.[citation needed] Consilience of agentic AI across autonomous transportation, industrial automation, and tailored healthcare has also supported its viability. Self-driving cars use agentic AI to handle complex road scenarios.[9] In 2025, research firm Forrester named agentic AI a top emerging technology for 2025.[10] Applications using agentic AI include: Agentic automation, sometimes referred to as agentic process automation, refers to applying agentic AI to generate and operate workflows. In one example, large language models can construct and execute automated (agentic) workflows, reducing or eliminating the need for human intervention.[14] While agentic AI is characterized by its decision-making and action-taking capabilities, generative AI is distinguished by its ability to generate original content based on learned patterns.[3] Robotic process automation (RPA) describes how software tools can automate repetitive tasks, with predefined workflows and structured data handling.[2] RPA's static instructions limit its value. Agentic AI is more dynamic, allowing unstructured data to be processed and analyzed, including contextual analysis, and allowing interaction with users.[2]

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Preparing for the era of agentic AI: how AI agents, automation, and people are transforming the enterprise. Agentic Automation Discover the place where agents think, robots do, and people lead. Agentic Testing Explore agentic testing for the enterprise Explore the Platform View all products Pricing Support Agentic Automation Agentic Automation Discover the place where agents think, robots do, and people lead. Processes Model and orchestrate agents, robots, and people end-to-end Agentic orchestration Business process management (BPM) Process intelligence Workflows Plan, build, and deploy automated workflows Agentic & robotic workflows Human-in-the-loop Agent evaluation Activities Empower agents and robots with AI, API, and rules-based tools Agentic activities RPA & API Forms & apps Intelligent Document Processing (IDP) Join CEO Daniel Dines to meet the reimagined UiPath Platform? for agentic automation Agentic Testing Agentic Testing Explore agentic testing for the enterprise Topics Unlock comprehensive testing for enterprises Enterprise applications Integrations SAP testing Test automation Products Take your testing to the next level with agentic testing Test Cloud Agent Builder for testers Autopilot? for testers Agentic testing is here. Catch all the buzz from our recent launch at the Agentic AI Summit. 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Contact us Sign in Agentic AI About AI Learn about the future of work, where state-of-the-art AI and automation combine to create powerful autonomous agents able to understand, build, and perform complex business processes. Agentic AI is an emerging technology that is set to transform industries everywhere. It combines new forms of artificial intelligence (AI) like large language models (LLMs), traditional AI such as machine learning, and enterprise automation to create autonomous AI agents that can analyze data, set goals, and take actions with decreasing human supervision. These agents are capable of decision making and dynamic problem-solving, learning, and improving through every interaction. Agentic AI is a probabilistic technology with high adaptability to changing environments and events. It relies on patterns and likelihoods to make decisions and take actions, as opposed to deterministic systems?such as Robotic Process Automation (RPA)?that follow fixed rules and predefined outcomes. Agentic AI now makes it possible to automate many workflows and business processes that deterministic systems have not been capable of addressing on their own. Agentic AI doesn't just enable enterprises to automate specific tasks?it powers intelligent systems capable of understanding context, adapting to new information, and collaborating with humans to solve complex challenges. By enabling machines to act independently in unstructured environments, agentic AI is redefining what automation can achieve. While agentic AI is opening up new areas to automation, RPA remains critical for highly compliant, secure and resilient operations. Therefore, the future of enterprise workflows will be a combination of both probabilistic and deterministic technologies, working together. Agentic AI has enabled a new type of automation?agentic automation?which can optimize complex, unstructured processes that traditional rules-based automation can't address by itself. Agentic automation marks a shift from traditional, rules-based automation to a more dynamic, context-aware approach. While RPA has been instrumental in automating structured, repetitive tasks, agentic automation introduces the capability to handle complex, decision making processes that can adapt in real time. This isn't just an expansion of RPA?s technological footprint; it's a transformative approach that greatly complements existing RPA offerings, enhancing an enterprise?s ability to tackle larger, more complex automations. Agentic automation involves a symbiotic combination of AI agents, RPA robots, and people. People provide the goals for the agents, ensure governance, and step in when human judgment and review is required (human in the loop). Robots maximize the accuracy, productivity, and success of AI agents by collecting the data required for agents to make decisions (for example, logging in, connecting, and understanding information across multiple systems); they also can complete a wide range of other defined actions for agents. It is becoming increasingly clear that an orchestrated

ecosystem of agents, robots, and people, managed on the same platform, offers higher productivity and better security and control. It integrates advanced AI with automation platforms like theUiPath Platform?,enabling enterprises to:

- Benefit from the seamless orchestration of human, robotic, and AI agent activities
- Operate a multi-agent ecosystem with the critical guardrails, governance, and security required by modern enterprises
- Automate dynamic workflows across CRM, ERP, and other systems
- Optimize decision-making using real-time data

This approach provides the capabilities and scalability that businesses need to expand automation?s scope, combining intelligence and action for greater efficiency. By powering next-generation AI agents to perform a wider array of tasks than ever before possible, agentic AI vastly expands what can be automated. Furthermore, it improves the quality of interactions between agents and humans. For enterprises, this delivers a number of important benefits:

- Increased efficiency and productivity Empowered software agents can now take on complex, decision-intensive tasks that were previously beyond the reach of machines. This allows people to focus their energy and expertise on strategic initiatives, creative problem-solving, and building stronger customer relationships?the activities that truly fuel business growth.
- Enhanced customer experiences Agentic AI revolutionizes customer interactions by providing personalized and responsive experiences at scale and speed. Leveraging sophisticated models, AI agents can infer customer intent, predict needs, and offer tailored solutions, all while operating 24/7 to ensure consistent and efficient support.
- Strategic human-AI collaboration Rather than replacing human employees, agentic AI systems can enhance human performance, productivity, and engagement. By seamlessly integrating with existing systems and processes, agentic AI systems can form a powerful partnership with workforces. This gives enterprises more combined capacity and intelligence to tackle complex challenges, automate decision making, and drive efficiency across their organizations.

Streamlining the insurance claims process The insurance industry is no stranger to paperwork and manual processes, but agentic AI is rewriting the rules. Insurance companies can leverage this technology to automate the entire claims process, from initial filing to final payout. This results in faster processing times, reduced errors, and a vastly improved customer experience. Imagine an agentic-AI-powered agent that can instantly assess the validity of a claim, gather necessary information from various sources, and communicate with the customer in a clear and empathetic manner. Along with accelerating the claims process, this reduces the administrative burden on human adjusters, allowing them to focus on more complex cases and deliver a higher level of personalized service.

Optimizing logistics and supply chain management Every minute counts in the world of logistics and supply chain management. Delays, disruptions, and inefficiencies can ripple through the entire system, costing businesses time and money. Agentic AI is emerging as a powerful tool to tackle these challenges head-on. Agentic-AI-powered software agents can analyze vast amounts of data in real-time, optimizing routes, predicting potential bottlenecks, and even adjusting inventory levels based on demand fluctuations. This dynamic optimization can help ensure that goods and services are delivered efficiently, reducing costs and improving customer satisfaction.

Empowering financial decision making Agentic AI is also making waves in the financial sector, enabling software agents to analyze market trends, assess investment opportunities, and even create personalized financial plans for individual clients. Freed from the burden of detailed, data-heavy analysis and report generation, financial advisors can now focus on building relationships and offering strategic guidance. Beyond investment advice, agentic AI is also transforming how financial institutions manage risk. Agentic-AI-powered agents can analyze vast amounts of data to surface potential risks and vulnerabilities, helping financial institutions proactively manage their exposure and ensure compliance with regulations. This proactive approach minimizes losses while strengthening the overall resilience of the financial system.

Accelerating drug discovery and development The healthcare industry is undergoing a digital transformation, and agentic AI is playing a pivotal role. For example, software agents might recommend treatment plans based on individual patient data, ensuring that care is tailored to each patient's unique needs and medical history. This personalized approach to healthcare holds the promise of improved patient outcomes and a more efficient use of medical resources. Agentic AI is also accelerating drug discovery and development by equipping software agents to rapidly analyze massive datasets, zero in on potential drug targets, and predict their efficacy. Doing so expedites the research process, leading to lower costs and an ability to speed up the availability of life-saving medications.

Transforming customer service and support Delivering exceptional customer experiences is a top priority for businesses across all industries. Agentic AI is stepping in to enhance customer service by enabling software agents to provide personalized, 24/7 support. And this support goes far beyond simple FAQs and automated responses. AI-powered customer service agents can understand oral and written customer queries, resolve complex issues, and even anticipate customer needs, providing a truly personalized experience. Imagine a virtual assistant that not only answers your questions but also proactively offers relevant information and recommendations based on your past interactions. This hyper-personalized service builds brand loyalty by providing customers with a top-notch experience.

Accelerating and optimizing testing Agentic testing leverages AI agents to perform a range of complex and critical testing tasks under human oversight. For

example, agents can create recurring reports about ongoing test projects. They can design, carry out, and analyze tests of applications. And agents can collaborate with to find and fix weak spots in testing plans and projects. While both agentic AI and generative AI (GenAI) are pivotal technologies, their focuses differ. Each has its unique strengths and applications. GenAI excels at creating new content across various formats, including text, images, music, and even code. It's adept at brainstorming ideas, crafting compelling narratives, and generating innovative solutions. However, generative AI primarily focuses on creation, relying on human input and guidance to determine the context and goals of its output. Agentic AI, on the other hand, is action-oriented, going beyond content creation to empower autonomous systems capable of independent decision making and actions. These systems can analyze situations, formulate strategies, and execute actions to achieve specific goals, all with minimal human intervention. They're designed to operate independently, adapting to changing environments and learning from their experiences. In essence, while GenAI focuses on creating, agentic AI focuses on doing. Generative AI's output is new content, while agentic AI's output is a series of actions or decisions. The two can be used in tandem to create powerful solutions that combine creativity with action. For example, a GenAI model could be used to create marketing copy, while an agentic AI system could autonomously deploy that copy to the optimal channels based on real-time data and campaign objectives. The journey of agentic AI began with early chatbots, rudimentary digital assistants that utilized basic pattern matching and decision trees to simulate conversation. These chatbots were a groundbreaking step in human-machine interaction, but they were limited in their ability to understand nuanced language, contextual cues, and complex queries. Despite their limitations, these early chatbots laid the groundwork for the development of more sophisticated conversational AI technology. They demonstrated the potential for AI to power autonomous, machine-to-customer interactions such as responding to customer requests, providing information on demand, and even carrying on basic conversations. However, chatbots' reliance on pre-defined rules and scripted responses restricted their ability to handle complex scenarios and adapt to unexpected user inputs. They simply didn't have the cognitive capabilities to handle more complex and nuanced interactions. But then, major advances in AI capabilities and enterprise technology began to expand the possibilities, ushering in the emergence of agentic AI. The AI landscape shifted dramatically with the introduction of powerful LLMs like GPT-3 and GPT-4. These models, trained on massive datasets, showcased AI's newfound ability to comprehend and generate human-like text. Conversations became more natural and meaningful, opening up new possibilities for AI applications. Think of LLMs as the brains behind agentic AI. They provide the foundation for natural language understanding, enabling AI agents to interpret complex instructions, engage in meaningful conversations, and even generate creative content. This enhanced language capability allows agentic AI to interact with users in a more natural and intuitive way, opening up new possibilities for collaboration and problem-solving. Moreover, LLMs have enabled agentic AI to reason and make decisions based on the information they process. Analyzing vast amounts of data and identifying patterns allows these AI agents to generate insights, make predictions, and take actions that align with their pre-defined objectives. This ability to think and act autonomously is a key characteristic of agentic AI, differentiating it from traditional automation technologies. Advancements in machine learning algorithms, coupled with ever-increasing computational power, further accelerated this evolution. These systems could now learn from vast amounts of data, refining their abilities and becoming increasingly adaptable to new situations. This shift paved the way for more dynamic automation and AI solutions. For example, reinforcement learning, a type of machine learning where autonomous agents learn by interacting with their environment and receiving feedback, has been instrumental in enabling agentic AI's high-level decision making capabilities. Learning from trial and error enables agentic AI systems to optimize their actions to achieve specific goals, even in complex and dynamic environments. Integrating AI tools with existing enterprise systems has been a game-changer. It's allowed autonomous agents to tap into a wealth of data sources across the organization—from customer relationship management (CRM) and enterprise resource planning (ERP) systems to supply chain management and HR tools. Breaking down data silos and connecting disparate systems gives agentic AI a 360-degree view of your business, enabling it to make smarter, data-driven decisions and automate complex workflows. Advancements in cloud computing have also played a crucial role in fueling the growth of agentic AI. Cloud platforms like Microsoft Azure and Amazon Web Services (AWS) provide the scalable computing power and storage capacity needed to train and deploy complex AI models. Additionally, sophisticated data processing tools enable businesses to extract valuable insights from massive datasets in real-time, fueling the decision making capabilities of agentic AI. Furthermore, the development of AI-powered automation solutions, such as the UiPath Platform, has further accelerated the adoption of agentic AI. These platforms offer a comprehensive suite of tools and services that simplify the design, development, and deployment of AI-powered automations, making it easier for businesses to create and manage intelligent agents that can handle a wide range of complex tasks and processes. As discussed above, the convergence of powerful LLMs, sophisticated machine learning,

and seamless enterprise integration has enabled the rise of agentic AI?which is the ?brainpower? behind AI agents. Fueled by greatly enhanced analytical, reasoning, learning, and inferential skills, this new breed of software agent can now operate with minimal human intervention to complete complex, dynamic processes that were once considered the exclusive domain of human intelligence. They can set goals and design and optimize processes for completing work. They can autonomously decide to take actions, or direct other agents to start a process. They can learn from their experiences and improve their performance over time. The potential of agentic AI is significant, but it's important to be mindful of the potential risks that come with this transformative technology. As AI systems become more autonomous and impactful, ensuring their responsible and ethical use becomes paramount. Researchers and developers are actively working on developing frameworks and guidelines to ensure that agentic AI operates in a transparent, fair, and accountable manner. Some areas of keen concern: Autonomy and oversight While the autonomy of agentic AI offers numerous benefits, it's important to carefully consider the implications of granting decision making power to machines. Striking the right balance between autonomy and human oversight is crucial to prevent unintended consequences and ensure that AI-driven actions align with ethical and legal standards. Transparency and trust The complex reasoning and decision making processes of agentic AI systems can often be opaque, making it difficult for users and stakeholders to understand how and why certain decisions are made. This lack of transparency can erode trust and raise concerns about the fairness and reliability of AI-driven outcomes. Security and privacy Integrating agentic AI with enterprise systems that contain sensitive data raises valid concerns about security and privacy. As these systems become more interconnected and autonomous, the risk of data breaches and cyberattacks increases. Strong governance Establish clear governance frameworks and compliance measures that define the roles and responsibilities of all stakeholders involved in the development and deployment of agentic AI systems. This includes establishing ethical guidelines for AI use, ensuring compliance with relevant regulations, and creating mechanisms for regular monitoring and auditing. Security and compliance Implement robust security measures, such as encryption, access controls, and regular vulnerability assessments to protect sensitive information and maintain the integrity of agentic AI systems. Additionally, ensure compliance with data protection regulations and establish clear guidelines for data usage to mitigate privacy risks and maintain ethical standards. Testing and validation Rigorous testing and validation are essential to ensure the reliability and safety of agentic AI systems. Conduct comprehensive testing under various scenarios, including both expected and unexpected situations, to identify and address potential flaws or unintended consequences before deploying the system in a real-world environment. Continuous monitoring and improvement Agentic AI systems should be continuously updated to ensure their effectiveness and security. Regular feedback loops, performance metrics, and user feedback can help identify areas for improvement and enable the system to adapt to changing conditions. Continuous learning and improvement are key to maximizing the value and longevity of an agentic AI investment. The massive leaps forward in AI that now allow machines to operate with near-human cognition are creating a seismic technology shift. Today, machines understand us better than ever before. They can learn, predict, intuit, and reason. They can take on undefined tasks, manage complex processes, and make nuanced decisions that only a year or two ago could only be completed by people. Agentic AI, in short, is enabling us to create a new, virtual workforce that can, for the first time in history, complete the work of human knowledge workers. This opens up entirely new possibilities in designing work processes, deciding on the split of work between agents and people, and defining the roles of people and machines in myriad processes across the organization. While advances in agentic AI have already changed some of the ways that people and machines interact and collaborate, they're just a couple of drops in the ocean of this sea-change. There?s a massive?and inevitable?wave of work transformation on the horizon that has only just started to coalesce and gather momentum. The way that the most modern and successful companies will operate in five years?the pervasiveness of automation and AI throughout their workstreams?what their people do, what machines do, and the ways people and machines work together?will bear little resemblance to how they operate now. They?ll operate better, faster, and more efficiently. They?ll be differentiated by their outstanding customer engagement, nimbleness in responding to current and future changes, and their ability to attain new levels of employee productivity and engagement. The possibilities are virtually endless, and the future of agentic AI is filled with promise. As this technology evolves, it can reshape the world of work and the roles of humans and machines in the world. English English Deutsch Français Português Español ???? ??? ???? 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