What has led to the rise of agent-based systems and the benefits that this approach can offer to organisations

The use of Agent-based systems has been explosive in the past decade, because modern organisations need to utilise them to cope with heterogeneous and rapidly changing data needed for their services coordination and their people management. The API economy, microservices, cloud/edge computing and event-driven architectures make it natural to delegate tasks to autonomous components. At the same time, advances in AI—first reactive and BDI agents (with explicit beliefs, desires and intentions), then multi-agent coordination and, recently, LLM-based tool-using agents—have made agents far more capable (Rao & Georgeff, 1995; Jennings, Sycara & Wooldridge, 1998; Yao et al., 2023).

Benefits to organisations include: (1) Modularity and autonomy—agents encapsulate goals and policies, easing change management; (2) Scalability and robustness—work distributes across many agents with graceful degradation; (3) Better alignment to business structure—agents mirror roles (e.g., pricing, risk, compliance) and negotiate or cooperate; (4) Decision quality and speed—agents reason over local state and shared context, now augmented by LLMs that can plan, use tools/APIs and summarise evidence (Russell & Norvig, 2021; Yao et al., 2023); (5) Integration—agents provide a uniform control layer over legacy systems and data sources.

Main models in use today span reactive/subsumption (fast stimulus–response), deliberative/BDI (symbolic goals and plans), market/game-theoretic multi-agent systems (coordination and incentives), learning-based agents (RL), and LLM-based agents that combine reasoning with tool use and memory (Jennings, Sycara & Wooldridge, 1998; Russell & Norvig, 2021; Yao et al., 2023).

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