

## Initial post 1

The rise of agent-based systems (ABS) can be attributed to advances in artificial intelligence (AI), distributed computing, and the increasing complexity of organisational processes requiring adaptive, autonomous decision-making. In essence, an agent is a software entity capable of perceiving its environment, making decisions, and acting autonomously to achieve defined objectives (Wooldridge, 2009). The evolution of AI techniques, such as machine learning, natural language processing, and knowledge representation, has enabled agents to become more intelligent and capable of handling dynamic and unpredictable environments.

From a technological perspective, the growth of networked infrastructures and the availability of high-performance computing resources have facilitated the deployment of multi-agent systems (MAS) in real-world applications (Jennings & Bussmann, 2003). Organisations increasingly rely on ABS for simulation, process automation, supply chain optimisation, and customer service, where scalability and adaptability are critical.

The benefits to organisations are significant. Firstly, ABS provide scalability by distributing problem-solving across multiple agents, enabling systems to handle larger and more complex tasks efficiently. Secondly, they offer adaptability, as agents can respond dynamically to changes in the environment without requiring centralised control (Russell & Norvig, 2021). Thirdly, ABS enhance collaboration and interoperability between different components or departments, aligning with the needs of modern, decentralised organisational structures.

In conclusion, the rise of ABS is driven by technological advances, the increasing complexity of organisational operations, and the need for systems capable of autonomous, intelligent decision-making. By leveraging ABS, organisations can achieve higher efficiency, resilience, and responsiveness in competitive markets.

## References

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