

This survey paper aims to provide an extensive collection of Agentic AI knowledge and set its boundaries for easier understanding by a wider audience of researchers, developers, and policy-makers. Key contributions of this survey include:

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- **Section IX** Looks at issues, as concerns
ance with the law.
- **Section X** Describes gaps in knowledge and prospected
Research and Development work alongside the considera-
tion of refreshing Agentic AI ideas.
- **Section XI** recommends the paper's final remarks,
including a conclusion of the findings and a remark that
cross-disciplinary connections are needed to move the
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This comprehensive survey will provide valuable insights into Agentic AI's current state, future potential, and the challenges that must be addressed to ensure its safe and effective deployment.

II. FOUNDATIONAL CONCEPTS AND DEFINITIONS

A. AGENTIC AI AND ITS ROLE IN THE AI ECOSYSTEM

Within the AI field, Agentic AI serves as a different form of intelligence that can take more autonomously functioning agentic behaviors that are not limited to performing specific tasks or following content-generating algorithms. When viewed in an ecosystem context, Agentic AI stands out because of its purpose, flexibility, and behavior, which enables such AIs to operate almost independently. Rather than following strict guidelines like other robotic AIs, Agentic AI systems are promoted to have rationalism in them, which enables each system [9] to reason and adapt to different scenarios and such circumstances in a sufficient way to accomplish goals. Due to its tendencies to enhance its functions to prepare for any obstacles, Agentic AI has been seen as a potential point of anchor for tasks and goals that require high levels of interactions, for example, autonomous devices, collaborative robots, and interactive decision support systems in the areas of finance and health care.

The increasing demand for systems capable of autonomously handling intricate and dynamic processes

learning approaches on the basis of the input data determined by the input environment. Thus, traditional environments with limited data are more suitable and rather more significant.

On the other hand, Agentic AI systems are characterized as possessing the characteristics of rationalism. There is no prescription of what they should do. They work with and adapt to their environment. On the other hand, while traditional AIs may be accurate, they do not have the ability to learn and adapt to their environment. An example may include a fault diagnosis system that is used to predict equipment failures. A traditional AI will not incorporate a fault diagnosis system that takes into account failures due to factors such as weather or schedule or changes in working conditions. On the other hand, Agentic AI can learn and adapt to its environment by processes depending on the data it receives and long-term strategies, such as reinforcement learning models.

As shown in Table 1, Agentic AI systems are designed to be rule-bound and have the ability to learn and adapt to their environment. Based on real-time data, they can be used to optimize for complex, dynamic environments. They can also illustrate Agentic AI's value in addressing the challenges of rule-bound AI falls short in addressing the challenges of dynamic environments.

C. EXPANDED COMPARISON

While classical AI systems are based on supervised-learning models, Agentic AI integrates an additional layer of