November 15, 2024

BitOoda AI Research

The Age of Agentic AI: Optimizing Enterprise Value through Autonomous Agents

Abstract

As AI becomes more accessible, a new frontier is rapidly gaining traction: AI agents. These autonomous systems are reshaping what's possible by setting and achieving goals, dynamically adapting to their environment, and collaborating across systems—all without human oversight. While Gartner predicts that by 2028, 33% of enterprise software applications will leverage agentic AI, we anticipate that this figure will be far higher as organizations recognize the immense potential of these systems. Companies that act now to develop robust agentic capabilities will gain a powerful advantage, using these technologies to transform automation, streamline operations, and redefine customer experience at an unprecedented scale.

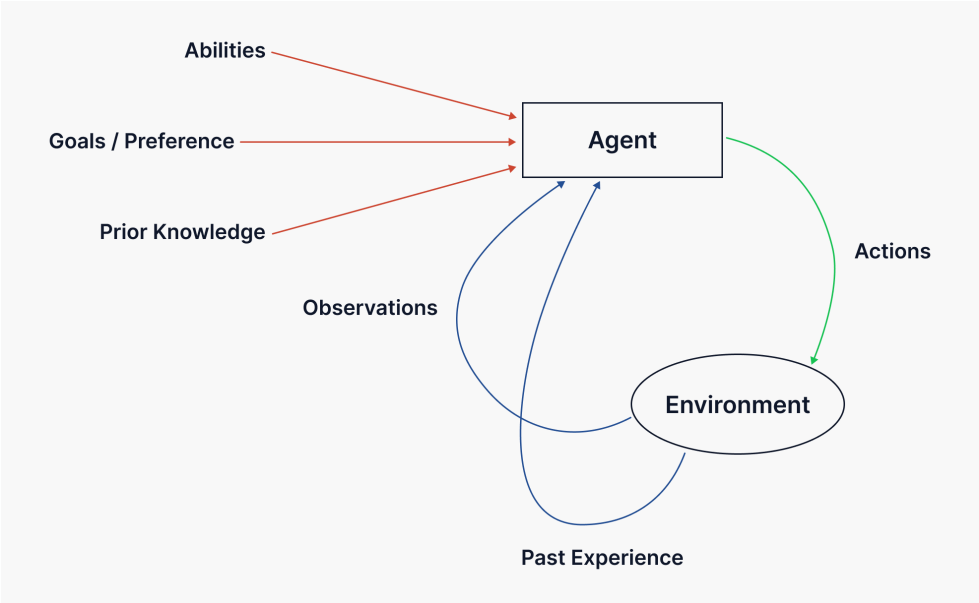

Figure: AI Agent workflow
Source: rightinformation.com

Research

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- What is agentic AI, and how does it go beyond traditional AI in autonomy and goal-setting?
- How do agentic systems function across levels, from basic automation to self-refining agents?
- What unique advantages does agentic AI offer enterprises, including adaptability, collaboration, and scalability for complex tasks?
- BitOoda offers consulting services to develop customized agentic AI solutions, backed by our in-house AI and development talent.

Understanding Agentic AI
Definition and Application

What are AI agents?

Agentic AI refers to autonomous software entities—agents—that perceive their environment, make decisions, and perform actions to achieve specific goals without continuous human guidance. These agents utilize LLMs under the hood, streamline processes, and adapt to new circumstances. Unlike traditional AI models that process tasks in isolation, agentic AI possesses a "chaining" ability, enabling it to respond to a single request with a series of coordinated actions. This allows complex goals to be broken down into smaller, manageable steps, guiding users through every stage of a project.

How Does Agentic AI Differ from Traditional AI Models?

Traditional AI models typically require explicit instructions and human oversight for each task. They process tasks in isolation and lack the ability to autonomously plan multi-step actions. Agentic AI, on the other hand, operates proactively. It can generate comprehensive action plans, adapt to changing situations, and learn from experiences without human intervention. For example, when tasked with creating a website, an agentic AI system would independently set objectives like selecting a content management system, drafting content, designing the layout, and optimizing for search engines, guiding the user from concept to completion.

Understanding Agentic AI

Levels of Autonomy

Defining AI agents has been challenging due to their varied capabilities. On this slide, we show a categorization framework to clarify agents' roles in automating knowledge work and how they will evolve with further advancements in agentic systems.

Level 5: Autonomy (AGI)
Hypothetical agents capable of end-to-end knowledge work with no oversight, using creativity and logical reasoning to handle complex, unfamiliar tasks.
Example: Fully autonomous digital knowledge worker, equivalent to an experienced human employee.

Level 4: Self-Refinement
Advanced agents that can improve performance autonomously, update their processes, connect to new data, and self-optimize.
Example: Adaptive invoice-processing agent that adds new vendors with minimal oversight and improves accuracy over time.

Level 3: Plan and Reflect
These agents exhibit constrained autonomy, adjusting plans based on user goals and refining their approach in real time.
Example: AI agent reconciling invoices, capable of adapting to complex rules and data variability.

Level 2: Agentic Assistant
Task-specific agents with the ability to interpret user intent and call tools but limited to single tasks with short-term plans.
Example: Virtual assistant summarizing or drafting emails based on prompts.

Level 1: AI-Augmented Automation
Basic decision-making augmented by LLMs, introducing limited agentic capabilities in static, rule-based workflows.
Example: Sorting customer support emails and forwarding them to the correct teams.

Level 0: Fixed Automation
Fixed rule-based automation (e.g., RPA) lacks agentic behavior, following deterministic rules without adaptation or planning.
Example: Data entry tasks, form-filling, and simple web scraping

How Does an Agentic System Work?
A Simplified View

- It is worthwhile to discuss how these agents operate. As previously mentioned, agents utilize **Language Models (LMs)** under the hood. Calls to the LMs can be made using API calls from off-the-shelf services like **OpenAI or Anthropic APIs**, or from models deployed in-house, but the essence remains the same.

- The tasks we design **rely heavily on prompts**; you need to tell the models exactly what to do. Here, prompts play an important role in determining how the model behaves and interacts with other agents to synchronize and harmonize to achieve common (or perhaps distinct) goals.

- Each agent is an **independent computational program** with its own set of inputs and outputs. The inputs, like in any other **Python program**, can be any relevant data, and the outputs can be used to **deliver your desired action**.

- An important part of dealing with agentic systems is orchestrating how the agents interact with each other. Many toolkits have been developed since the emergence of agentic system development, including **LangChain, LangGraph, AutoGPT**, and **BabyAGI**. These frameworks differ in their approaches and capabilities. Despite these developments there is a clear of standardization as many of these libraries remain experimental in nature. While these frameworks and libraries are topics for a future report, feel free to reach out to us if you have any questions. We at BitOoda specialize in the use of many of these frameworks.

Benefits of Agentic AI in Enterprises

Characteristics of Agents and How They Can be Beneficial

Improved Complex Task Automation

Agentic AI automates complex tasks by breaking them into smaller steps, relieving human teams to focus on strategic work, enhancing operational efficiency, and ensuring consistent, high-quality outcomes.

Flexibility in Changing Situations

Agentic AI's adaptability allows it to adjust in real-time to market shifts or feedback, staying relevant without extensive oversight and enabling quick enterprise responses to new developments.

Enhanced Collaboration

Agentic AI fosters teamwork by coordinating tasks, identifying team strengths, and addressing collaboration challenges, creating a unified platform for knowledge sharing and efficient resource use.

Scalability for Future Growth

The modular design of agentic AI supports easy scalability, allowing enterprises to add features or manage growth without major redesigns, supporting business expansion seamlessly.

Enterprise Applications of Agentic AI

Early Applications in Business

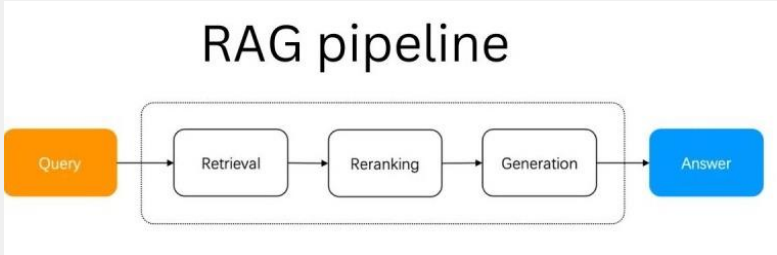
Let's dive into the simplest application of Agentic RAGs. But first, it's essential to understand what RAGs are.

What is RAG?

Retrieval-Augmented Generation (RAG) combines generative AI with real-time data retrieval, creating responses grounded in actual information from a knowledge base.

Why is RAG Needed?

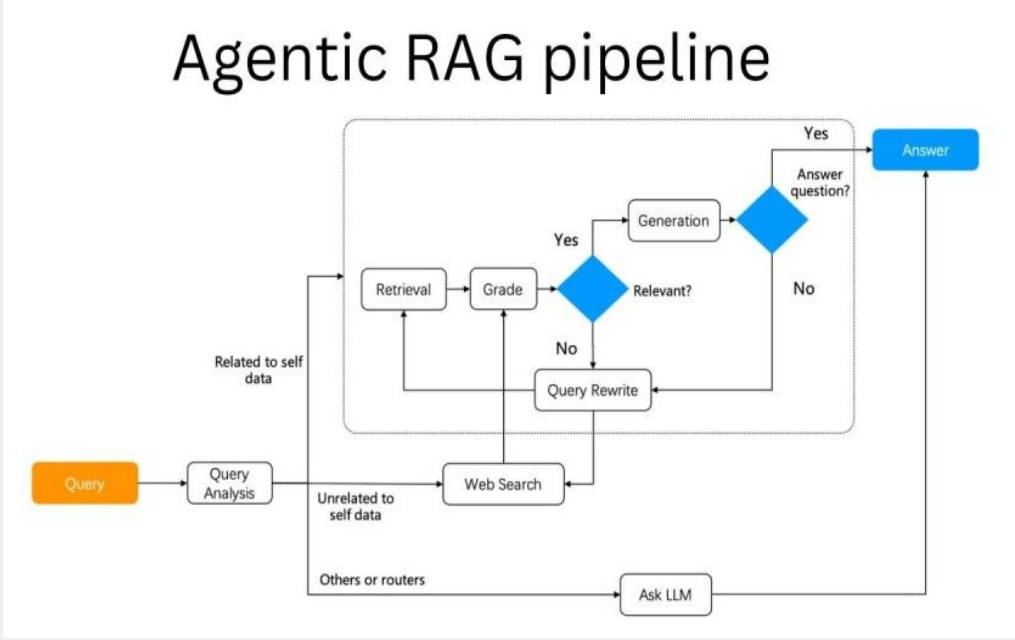
1. **Overcomes Knowledge Cutoff**: RAG keeps responses current by accessing recent data.
2. **Reduces Hallucination**: Real info retrieval lowers the chance of AI making stuff up.
3. **Boosts Enterprise Data Value**: RAG taps into company data, making it actionable and valuable.



Source: www.it-daily.net

What are Agentic RAGs

Agentic RAG represents a significant advancement over traditional Retrieval-Augmented Generation models. While traditional RAG systems follow a linear pipeline—response generation, synthesis, reclassification, and extraction—agentic RAG employs agent-based technologies to provide coordinated responses across multiple documents. This approach not only accesses information but also understands the context and relevance of the data being retrieved, offering more comprehensive and accurate answers.



Source: www.it-daily.net

Enterprise Applications of Agentic AI

More Industry Applications

Cloud software provider ServiceNow is integrating AI agents into its platform to automate IT and customer service management. The AI handles routine ticket requests autonomously, reaching out to human supervisors only when necessary. This shift allows IT professionals to focus on more strategic tasks, enhancing productivity and operational efficiency.

Data analytics company Palantir uses agentic AI internally for legal work, human resources, and facilities management. It also assists clients in developing their own AI agents. The company highlights potential challenges such as the need for governance and the risks of AI-driven cyberattacks but underscores the benefits of a "virtual workforce" that augments human efforts.

Intuit is leveraging agentic AI to navigate tax code changes that impact its products. Instead of a team of developers researching and implementing new elements, agentic AI spans various functions—from detecting changes to associating them with code and determining necessary modifications—acting as a copilot for developers.

Accenture has partnered with NVIDIA to lead enterprises into the era of AI by launching the Accenture AI Refinery platform. This platform assists companies in initiating their custom agentic AI journeys using NVIDIA's AI stack. Internally, Accenture's marketing function is integrating the AI Refinery platform with autonomous agents to create and run smarter campaigns more efficiently

BitOoda's Agentic AI Development:
Agent Products We Develop & Deploy

- BitOoda builds **custom agentic systems**, applying AI expertise to create tailored platforms for business needs in **AI, crypto, and finance.**
- These tools drive productivity, streamline tasks, and improve decision-making, enabling businesses to operate **more efficiently, gain insights**, and **achieve scalable growth**.
- BitOoda's in-house **AI-powered brainstorming platform** is an agentic system that simulates a **multidisciplinary research team** with virtual roles like **legal advisors, inventors, critics, and team leader**.
- The platform integrates data from various sources, using **RAG** for knowledge base access, **web scraping**, and **internal data** from Excel and documents.

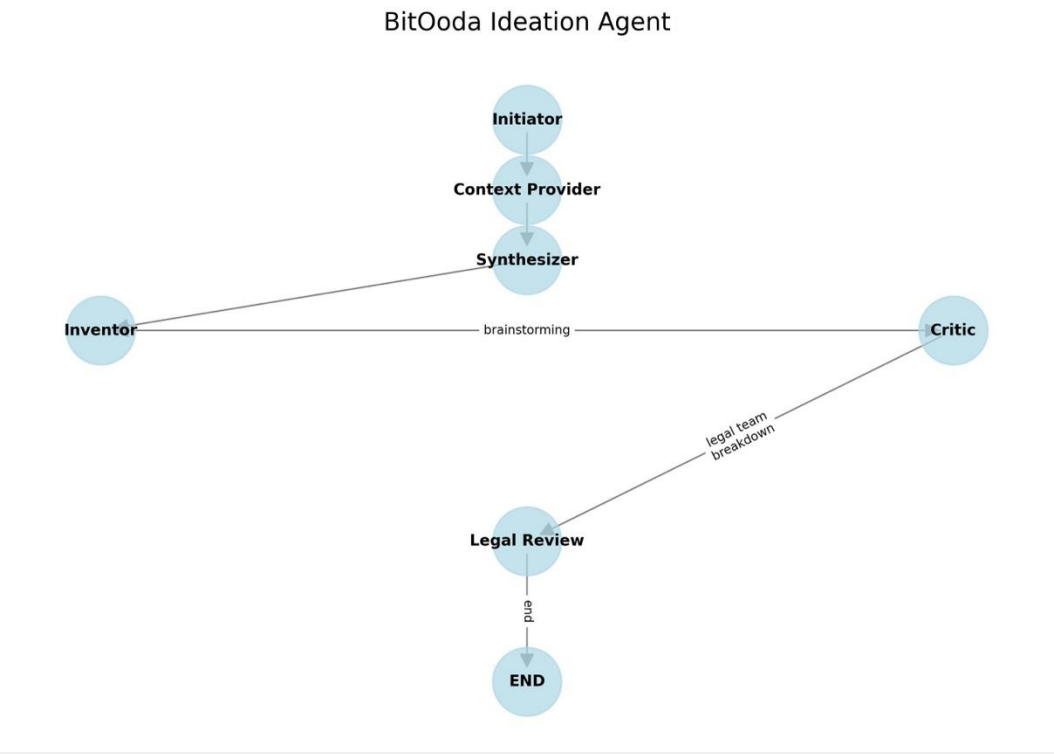


Figure: Direct Acyclic Graph depicting interactions in the BitOoda AI Ideation System

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Niraj Yagnik and Dhyay Bhatt, the primary research analysts of this report, hereby certify that all of the views expressed in this report accurately reflect their personal views, which have not been influenced by considerations of the firm's business or client relationships.

Conflicts of Interest

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