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# ALL ABOUT AI [ ARTIFICIAL INTELLIGENCE] YOU GOTTA KNOW !!



## WHAT'S AGENTIC-AI?AND IT'S BASICS!

Agentic AI refers to a type of sophisticated AI that operates autonomously, similar to a human agent, by making decisions and performing tasks to achieve specific objectives.

### Key Characteristics:

- ✓ Independence: It can operate independently without requiring constant supervision.
  - ✓ Purpose-Driven: It is designed to comprehend and work towards specific objectives.
  - ✓ Adaptability: It assimilates information, adjusts to changing circumstances, and enhances its strategies over time.
  - ✓ Decision-making: It can analyze circumstances and make wise selections based on its knowledge.
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# ★ WHAT'S LLM [ LARGE-LANGUAGE-MODEL ]

Large Language Models (LLMs) represent an exciting advancement in artificial intelligence, designed to improve how machines comprehend and utilize human language. These models acquire knowledge from vast amounts of text data, allowing them to respond in a manner that mirrors human fluency and depth. LLMs are capable of much more than merely answering inquiries; they can also translate languages, condense complex information, and perform various other natural language processing functions. They have become crucial tools in the modern digital landscape as they lead the way in AI innovation, creating new possibilities for automation, education, and communication.

## • HOW Large Language Models (LLMs) MODEL WORKS?

Here is how Large-Language-Models (LLMs) works 📌

**1. The Pre-Training Phase:** Large Language Models (LLMs) are developed using extensive and diverse text corpora containing billions of words, such as those found in Wikipedia and GitHub.

✦ Unsupervised Learning: The models learn the intricacies of language by predicting the next word in a sequence, considering syntax, meaning, and context.

✦ Contextual embeddings: Through pre-training, LLMs create complex word representations that capture nuanced meanings and relationships.

## **2. Transformer Architecture:**

✦ Self-Attention Mechanism: The models dynamically prioritize the importance of words in a sequence, enabling a thorough understanding of context.

✦ Parallel Processing: Transformers handle entire sequences of text simultaneously, facilitating efficient training and modeling of long-range dependencies.

✦ Layer Stacking: Utilizing multiple transformer layers enhances language representations from simple links to intricate structures.

### **3. Fine-tuning Phase:**

❖ **Task-Specific Adaptation:** After the pre-training stage, LLMs are fine-tuned through supervised learning on smaller, specialized datasets tailored for specific uses (e.g., translation, summarization).

❖ **Optimization:** The fine-tuning process improves accuracy, relevance, and alignment with the specific domain of the target task.

### **4. Prompting and Conditioning:**

❖ **Input Conditioning:** LLMs are provided with clear prompts (questions, instructions, examples) that guide the generation of their output.

❖ **Few-Shot and Zero-Shot Learning:** These models can generalize with limited examples (few-shot) or draw upon pre-existing knowledge (zero-shot) without further training.

❖ **Context Sensitivity:** The outputs are adjusted according to the prompt, ensuring that the responses are coherent and pertinent.

### **5. Text Generation Process:**

❖ **Token-by-Token Prediction:** LLMs create text sequentially, forecasting one word at a time based on preceding tokens.

❖ **Dynamic Context Updating:** Each new token modifies the internal state of the model, maintaining consistency throughout the generated output.

❖ **Sampling Techniques:** Techniques such as top-k and nucleus sampling manage the creativity and relevance of the generated text.

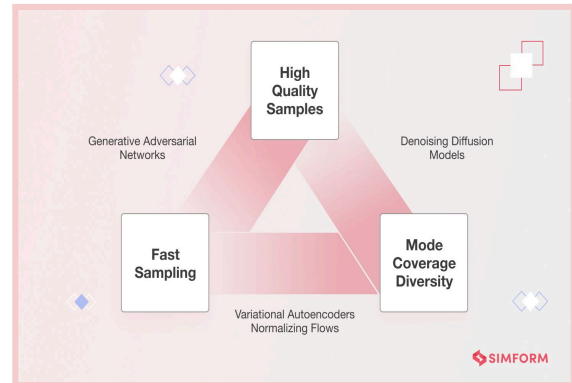
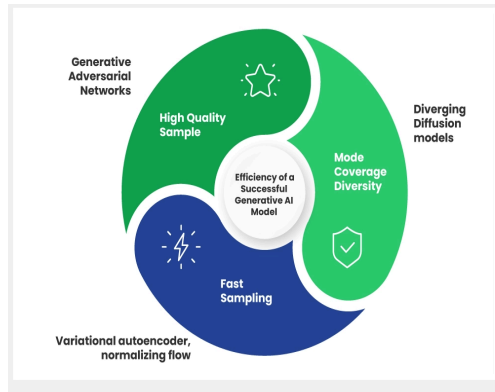
### **6. Integration and Deployment:**

❖ **Inference Efficiency:** LLMs are implemented in real-time applications to produce human-like text on a large scale.

❖ **Ethical and Safety Considerations:** Employing filtering, moderation, and alignment practices aims to mitigate biases and ensure responsible usage.

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# ● WHAT'S GENERATIVE-AI (GEN-AI)?



✦ Generative AI is a pioneering field within artificial intelligence that creates original content—including text, images, audio, and video—rather than simply examining or classifying pre-existing data. These models, built on sophisticated deep learning frameworks such as transformers and GANs, acquire intricate patterns from extensive datasets and generate highly convincing, human-like outputs. Generative AI is revolutionizing various sectors by streamlining and enhancing creative tasks like writing, design, and music. Nonetheless, this potent technology prompts concerns about authenticity, intellectual property rights, and possible misuse, highlighting the need for responsible development and implementation.

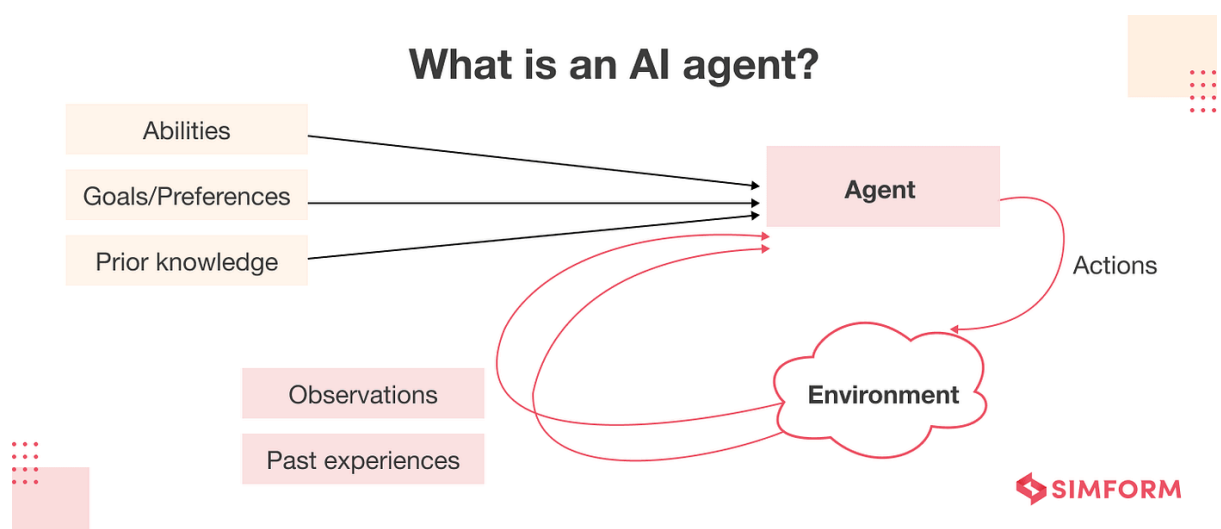
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# ● DIFFERENCE BETWEEN GENERATIVE-AI / AGENTIC-AI

<u>Feature</u>	<u>Generative AI</u>	<u>Agentic AI</u>
<u>Primary Function</u>	<u>Produces new content (text, images, audio, etc.)</u>	<u>Functions independently to accomplish goals</u>
<u>Main Focus</u>	<u>Generating realistic, human-like outputs</u>	<u>Reasoning, strategizing, and making decisions</u>
<u>How it Works</u>	<u>Learns from data patterns and predicts results</u>	<u>Evaluates scenarios, adapts, and takes actions</u>
<u>Examples</u>	<u>ChatGPT (text), DALL-E (artwork)</u>	<u>AI assistants that organize tasks or automate</u>
<u>Typical Use Case</u>	<u>Creative writing, art generation, music composition</u>	<u>Workflow automation, decision-making assistance</u>
<u>Key Difference</u>	<u>Generation of output</u>	<u>Autonomous actions to achieve goals</u>

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# ★ WHAT'S OPENAI'S-AGENTS SDK



The OpenAI Agents SDK is a compact and deployable framework for constructing AI agents and multi-agent systems using Python. It builds upon OpenAI's previous Swarm initiative by offering fundamental components—like agents, handoffs, and guardrails—that streamline the process of developing sophisticated AI workflows. By managing intricate details behind the scenes, the SDK enables researchers and developers to concentrate on creating intelligent, objective-oriented AI systems that can seamlessly integrate into practical applications.

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## ● WHY DO WE USE OPENAI-AGENTS-SDK

❖ The OpenAI Agents SDK is utilized since it significantly streamlines the development of intelligent AI agents and multi-agent systems. It permits developers to effectively construct intricate AI workflows by hiding low-level implementation specifics. The SDK facilitates both autonomous and cooperative agent actions to successfully achieve established objectives. Moreover, it supports smooth interaction with various applications, data sources, and services, enhancing adaptability. Consequently, the OpenAI Agents SDK boosts the scalability, maintainability, and overall efficiency of implementing advanced, goal-oriented AI systems in real-world scenarios.

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## ● WHAT BENEFIT DOES OPENAI-AGENTS SDK OFFERS!!

➤ Following are the advantages of the OpenAI Agents SDK 🙌:

\*Streamlines Development: Offers a concise set of core elements, minimizing the complexity involved in constructing intelligent single and multi-agent workflows.

\*Enhances Autonomy and Collaboration: Allows agents to function independently or work in coordinated teams, boosting flexibility in task execution.

\*Enables Smooth Integration: Effortlessly connects AI agents with external data sources, applications, and services to improve functionality.

\*Supports Scalability: Empowers AI systems to effectively manage rising complexity and workload demands.

**\*Encourages Maintainability:** Fosters modular and well-organized code structures, making system updates and long-term management easier.

**\*Speeds Up Innovation:** Releases developers and researchers from low-level implementation concerns, allowing them to focus on designing advanced AI behaviors.

**\*Facilitates Real-World Implementation:** Aids in the quick development of dependable and adaptable AI systems suitable for deployment in practical settings.

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## **Summary of My Findings**

**Agentic AI** refers to self-sufficient intelligent systems that operate similarly to human agents. These systems are capable of making their own decisions, adjusting to changing environments, and pursuing defined objectives without the need for ongoing human supervision. Through their interactions with the environment, agentic AI systems are able to learn and progressively improve their decision-making and problem-solving abilities.

**Large Language Models (LLMs)** constitute a group of sophisticated AI systems trained on vast amounts of text data to understand and produce human-like language. By employing transformer-based frameworks, LLMs grasp intricate linguistic structures and contextual connections, which enables them to carry out a variety of natural language processing tasks, including translation, summarization, and answering questions. Generally, LLMs go through a two-part training process: first, they are pre-trained on extensive datasets to absorb general language characteristics, followed by fine-tuning focused on specific tasks.



Furthermore, these models demonstrate the ability for few-shot and zero-shot learning, which allows them to adapt to new tasks with minimal further training.

**Generative AI** concentrates on creating original content—including text, visuals, audio, and multimodal outputs—rather than merely analyzing or classifying existing data. Utilizing deep learning models like transformers and generative adversarial networks (GANs), generative AI systems can generate highly realistic and imaginative outputs. This technological capability has profoundly influenced creative fields such as writing, design, and music; however, it also brings forth ethical issues regarding authenticity, originality, and potential abuse.

**The primary difference between generative AI and agentic AI** lies in their core functions. Generative AI is essentially aimed at generating new, human-like content by learning from data distributions, whereas agentic AI focuses on autonomous decision-making, goal-oriented behavior, and adaptive reasoning to tackle complex tasks. Generative AI specializes in pattern recognition and content creation, while agentic AI involves assessing situations, making decisions, and executing actions. For instance, generative AI can write text or create images, while agentic AI can oversee workflows, make decisions, and coordinate autonomous systems.

**The OpenAI Agents SDK** is a Python-based toolkit designed to assist in the development and implementation of intelligent AI agents and multi-agent systems. This SDK offers modular resources for building both autonomous and collaborative agents that can integrate smoothly with external applications and data sources. By simplifying the complexities involved in agent workflows, the OpenAI Agents SDK enables developers and researchers to construct sophisticated AI systems with greater efficiency and effectiveness. It promotes scalability, modular design, and innovation, thus allowing for the swift development and deployment of dependable AI solutions across various domains.