
The Rise of AI Agents:
Agentic AI in Quality Engineering
planit an NRI company
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わたしはだれでしょう？

- Director-NextGen Solutions, **Planit** *(an NRI Company)*
- Distinguished Speaker by ACM
- FOSS Fan
  - *Project Leadership & Committer - Selenium.dev*
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  - *Committer - Appium.io*
  - *K8s-Selenium*
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AI in Japan!

Japan's AI Demand Will Increase 320x by 2030, Industry Leader Says at NVIDIA AI Day Tokyo

At the event, which highlighted sovereign AI advancements in Japan, Kuniyoshi Suzuki of SoftBank Corp. discussed foundational technologies needed for AI expansion across the nation.

October 1, 2025 by Masataka Osaki

> Japan will see a 320x increase from 2020 in demand for AI computing power by 2030.

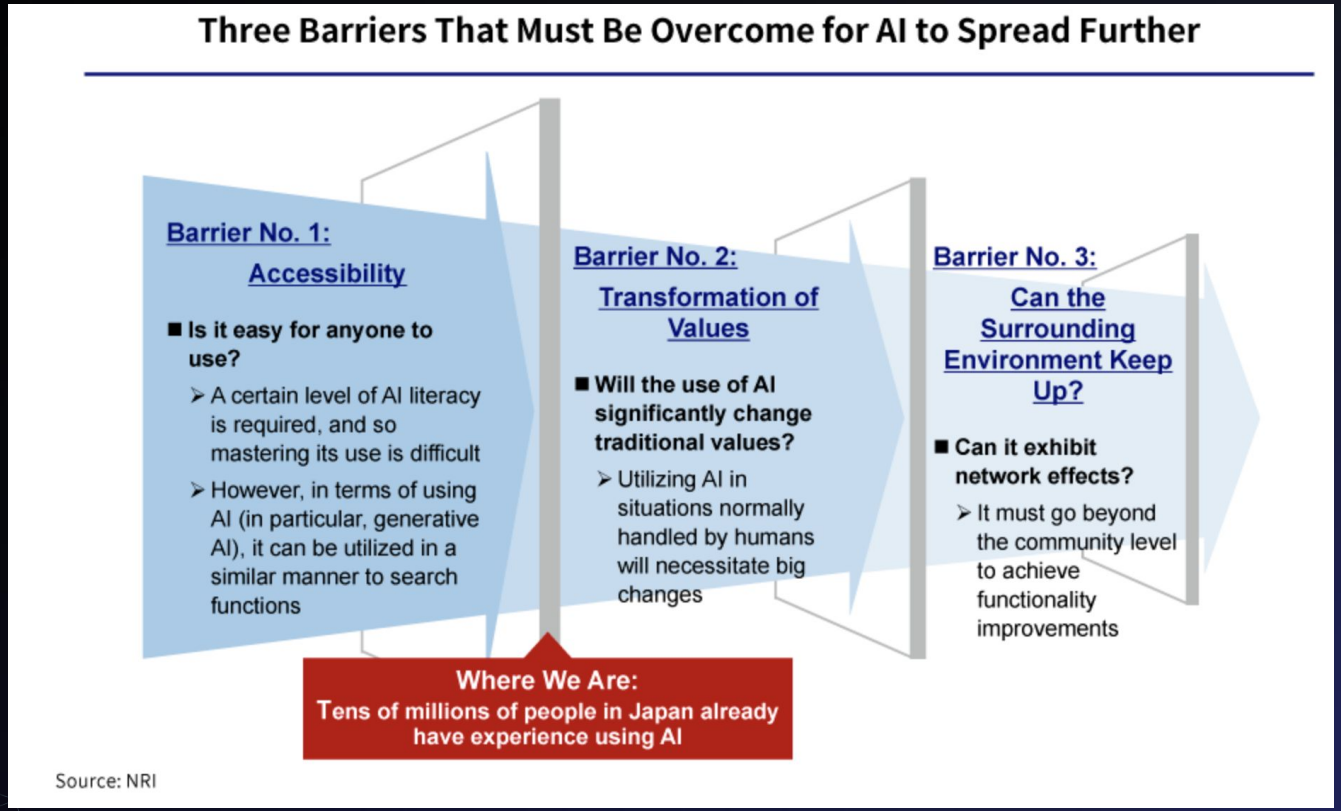
Kuniyoshi Suzuki
Senior Director, Cloud AI Service Division
SoftBank Corp.

ARTIFICIAL INTELLIGENCE

Japan AI developers see path to success in localized training data

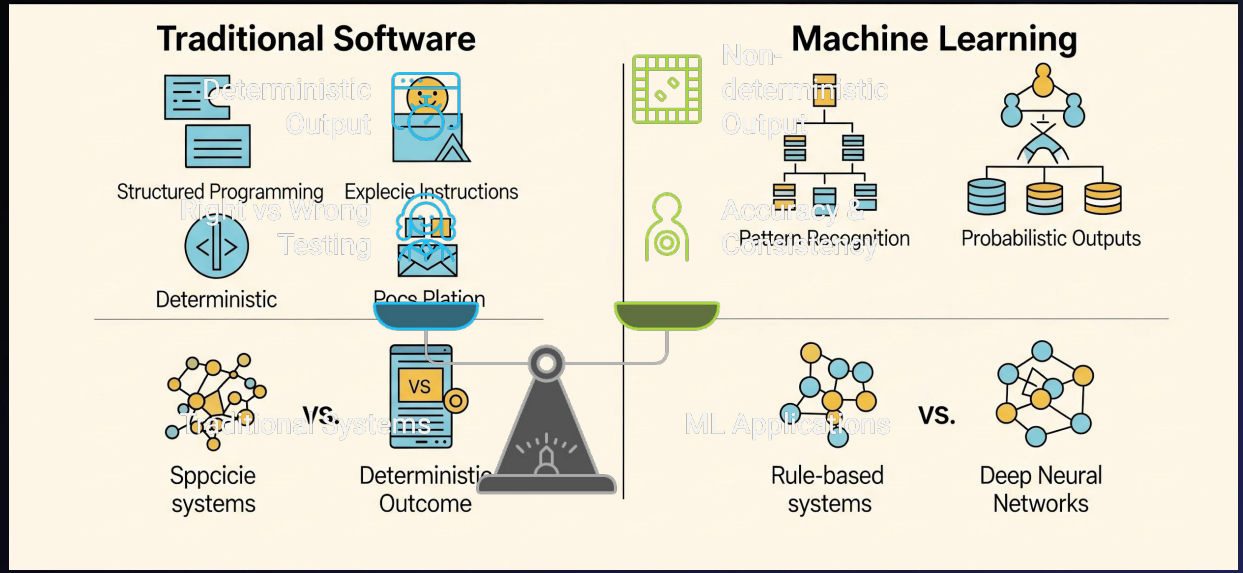
SoftBank developing large language model based on 9,000 hours of conversations

NRI: Barriers to overcome for AI adoption



In the era of AI, it's not about machines replacing humans—it's about humans leveraging AI to unlock new potentials. In test automation, AI isn't just a tool; it's a partner in driving innovation and excellence.

Software Paradigms: Traditional vs. Machine Learning



The Testing Reality Check

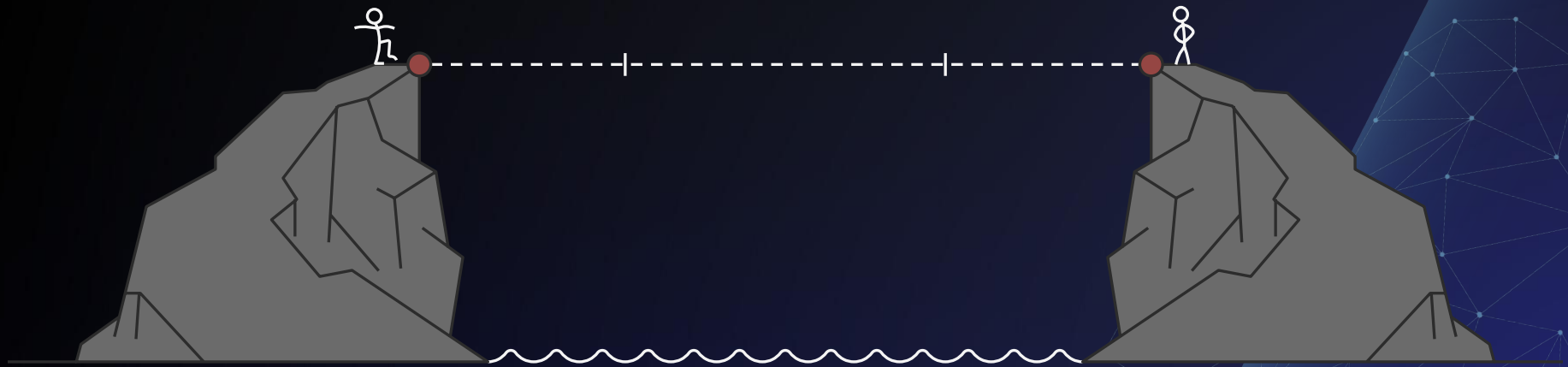
The Current State of Testing in AI

Traditional Automation

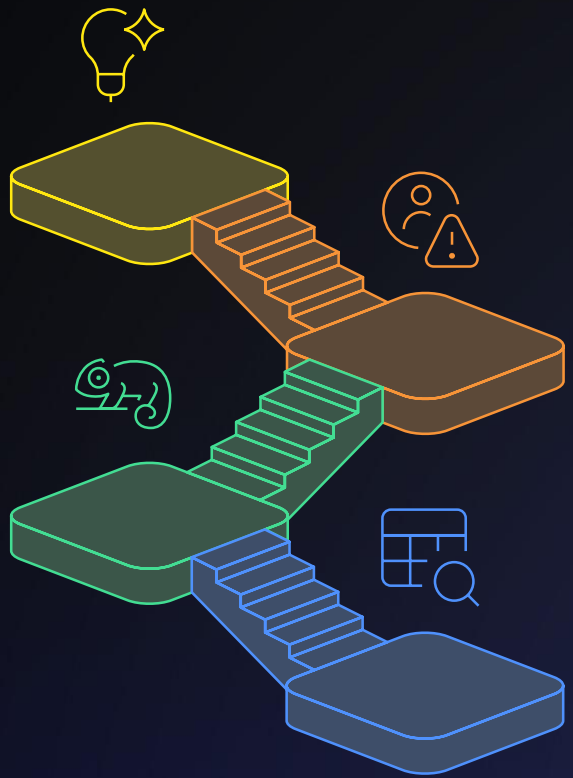
Limited autonomous task performance

AI- Assisted Testing

Independent task execution achieved



The Vision....



1 Discover New Flow

AI identifies new user flows during testing.

2 Adapt to UI Changes

AI automatically adjusts to UI updates.

3 Identify Risks

AI detects potential risks not initially considered.

4 Suggest Test Cases

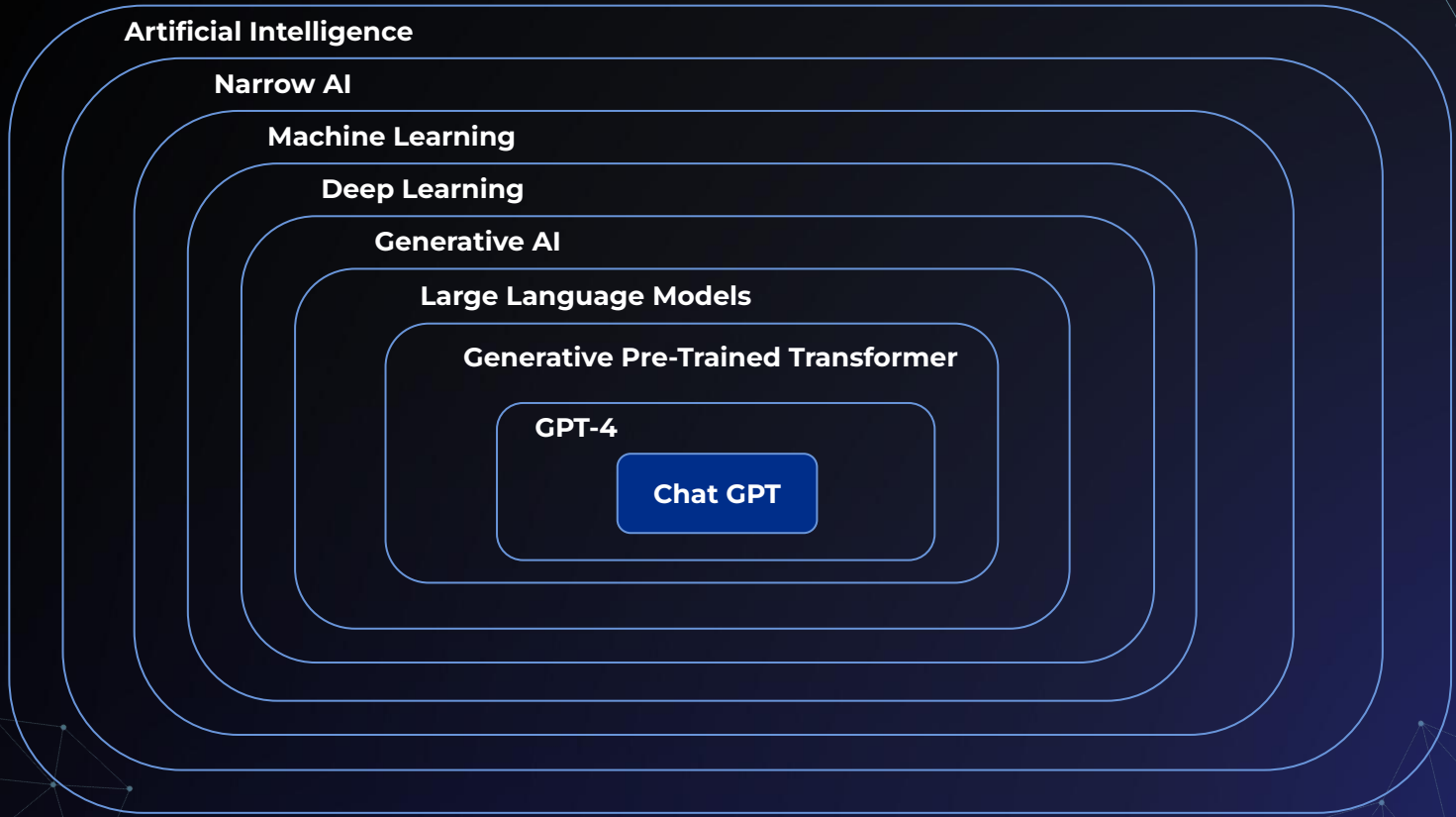
AI proposes new test cases based on production patterns.

Let’s talk AI...

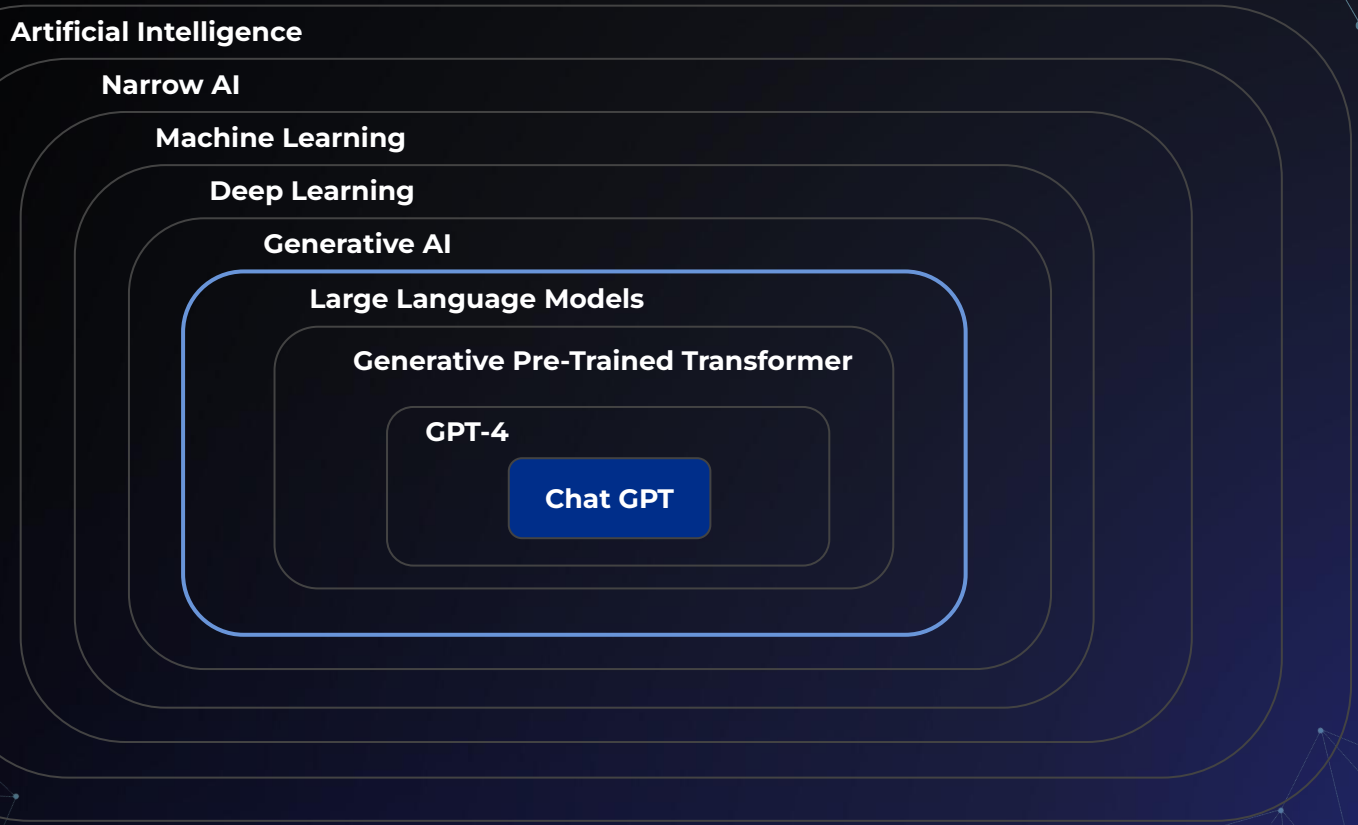
Artificial Intelligence

A piece of technology that can perform tasks that mimic human intelligence, such as those requiring reasoning, problem-solving, decision-making, or language understanding.

Taxonomy of Artificial Intelligence

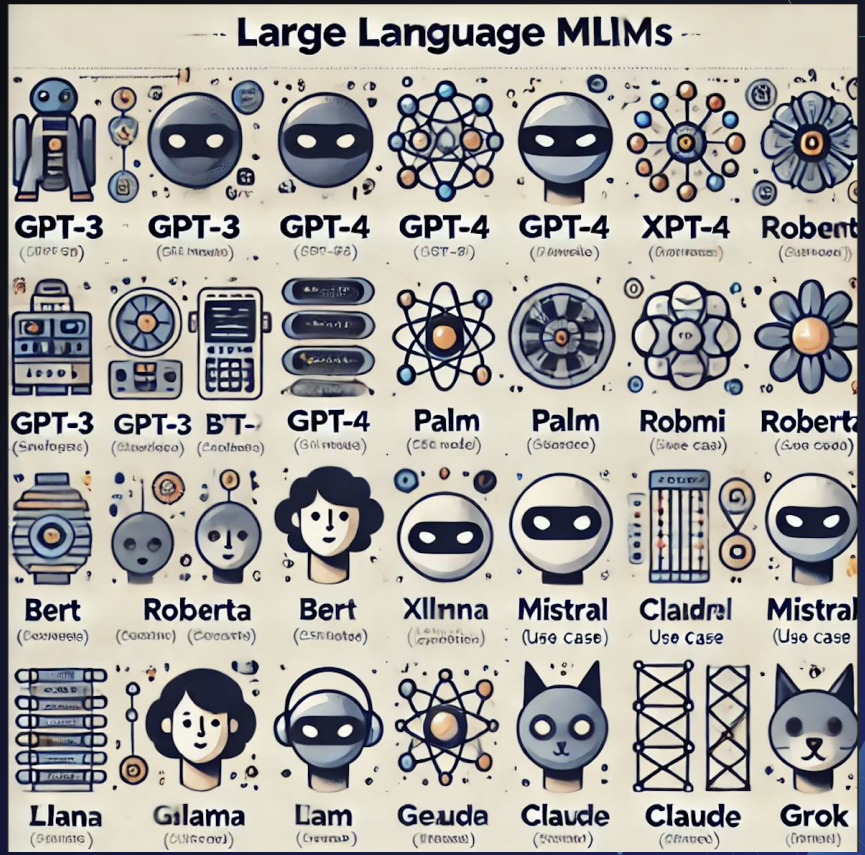


LLM's



Large Language Models

- ★ GPT-3 - OpenAI
- ★ GPT-4 - OpenAI
- ★ BERT - Google
- ★ T5 - Google
- ★ PaLM - Google
- ★ RoBERTa - Facebook AI
- ★ XLNet - Google/CMU
- ★ LLaMA - Meta AI (Facebook)
- ★ Gemini - Google
- ★ Mistral - Mistral AI
- ★ Claude - Anthropic
- ★ Grok - xAI (Elon Musk)



AI Agents

"AI Agents are the shift from asking 'Can you do this task?' to saying 'You handle this domain.'"

"They're specialized AI systems that can act independently within their area of expertise - but each works alone."

Agentic AI

"Agentic AI is the shift from asking 'What should I do?' to declaring 'Here's what I want to achieve.'"

"It's AI that doesn't just respond - it takes initiative, learns from experience, and persistently works toward your goals."

AI Agents Vs Agentic AI

Agentic AI is like the **concept of an autonomous vehicle**

An AI agent is like a **Tesla on Full Self Driving mode**

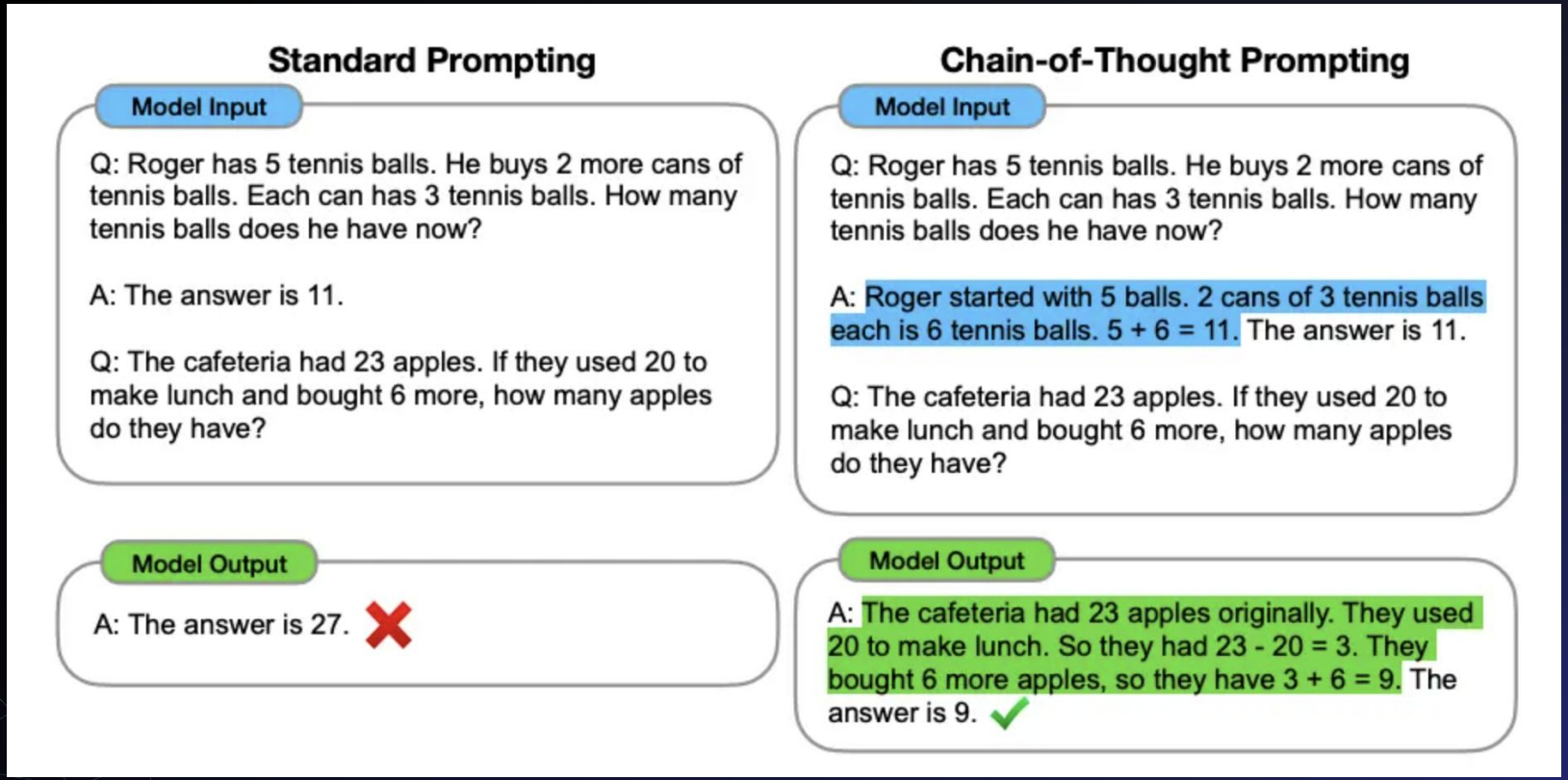
How Agentic AI works... Task Decomposition

Chain-of-Thought (CoT) serves as the primary decomposition framework

Complex user tasks are systematically broken down into manageable subtasks

Sequential processing enables step-by-step problem solving

Chain of Thought



How Agentic AI works... Adaptive Learning

Plan : **Strategic task analysis and resource allocation**

Execute : Active implementation of planned actions

Reflect : Performance evaluation and outcome assessment

Refine : Strategy optimization based on reflective insights

“Smart agents are great, but what if they have no idea what they’re talking about?

That’s where retrieval-augmented generation — or RAG — changes the game.”

Knowledge Enhanced LLMs

Incorporating knowledge into LLMs can empower their memorization and reasoning abilities

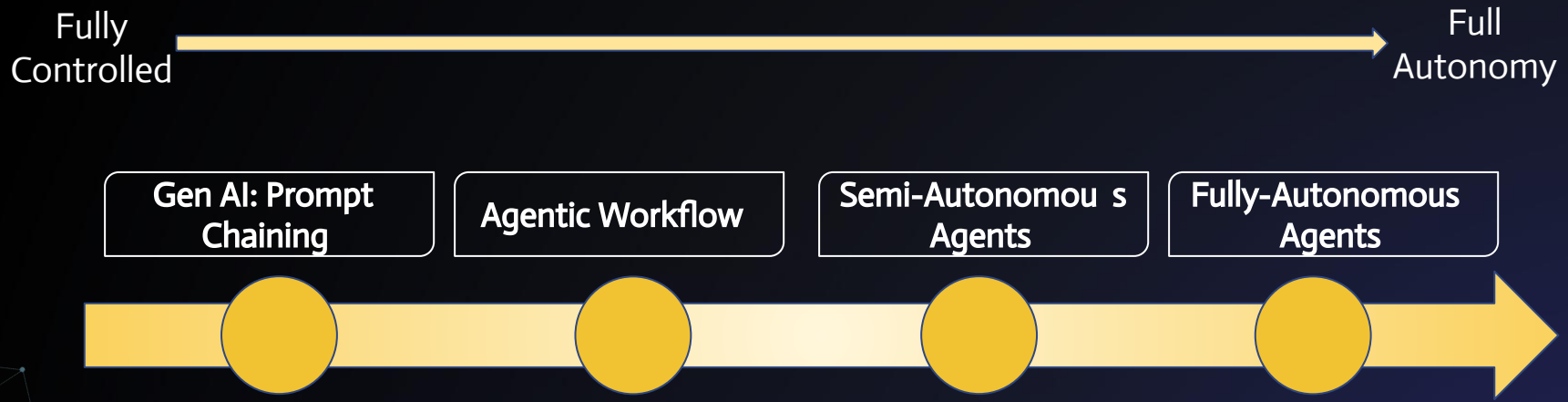
Retrieval Augmented Generation

RAG Vs Agentic RAG

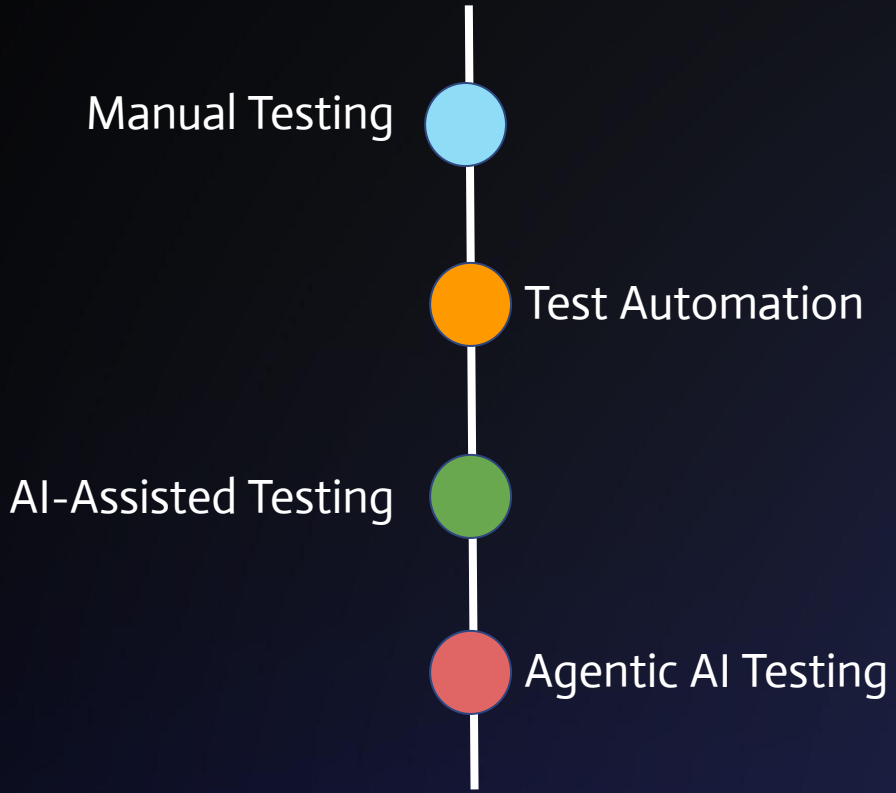
RAG	Agentic RAG
Static Info retrieval with No decision making	Autonomously decide what to retrieve and how to act on it
Single Step queries and response	Multi-step reasoning and actions with multi-agents
Single LLM for all the task	Right LLM for right task
No human intervention: Input In & Output	Human in the loop as necessary

Agentic AI workflow

Agentic AI Spectrum



Where are we now...



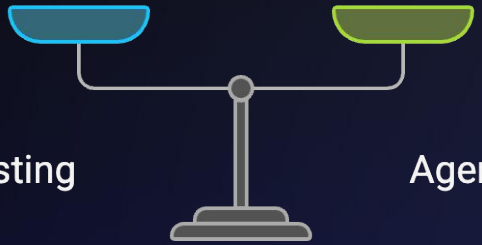
Agentic AI in Quality

Writing Tests

Maintaining Scripts

Reactive Debugging

Isolated Testing



Traditional Testing

Defining Goals

Guiding Agents

Proactive Risk Management

Collaborative Intelligence

Agentic AI Testing

Agentic AI Capabilities...

Autonomous Healing

Fixes broken tests automatically

Adaptive Execution

Adjusts to application changes

Risk-Based Prioritization

Focuses on high-impact areas

Intelligent Test Generation

Creates tests from requirements

Continuous Learning

Improves from each test run

What Powers Agentic AI?

Agents Together...

Orchestrator Agent

Manages overall testing strategy and workflow

Learning Agent

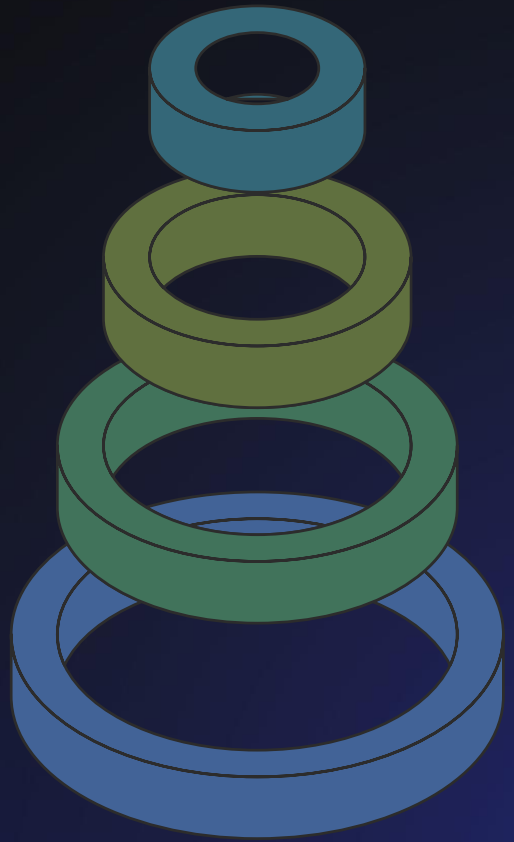
Continuously improves from testing results

Specialist Agents

Focus on specific testing domains

Communication Layer

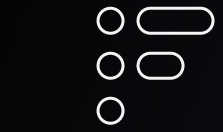
Enables agent collaboration and data exchange



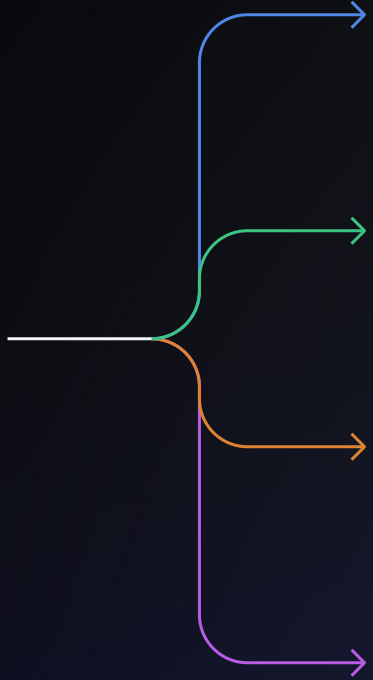
“Let’s Build One Together”

Scenario

User Story to BDD Gherkin format



UserStory to BDD



UserStory Analyser

Agent responsible for analyzing user stories.

TestScenario Generator

Agent that generates test scenarios.

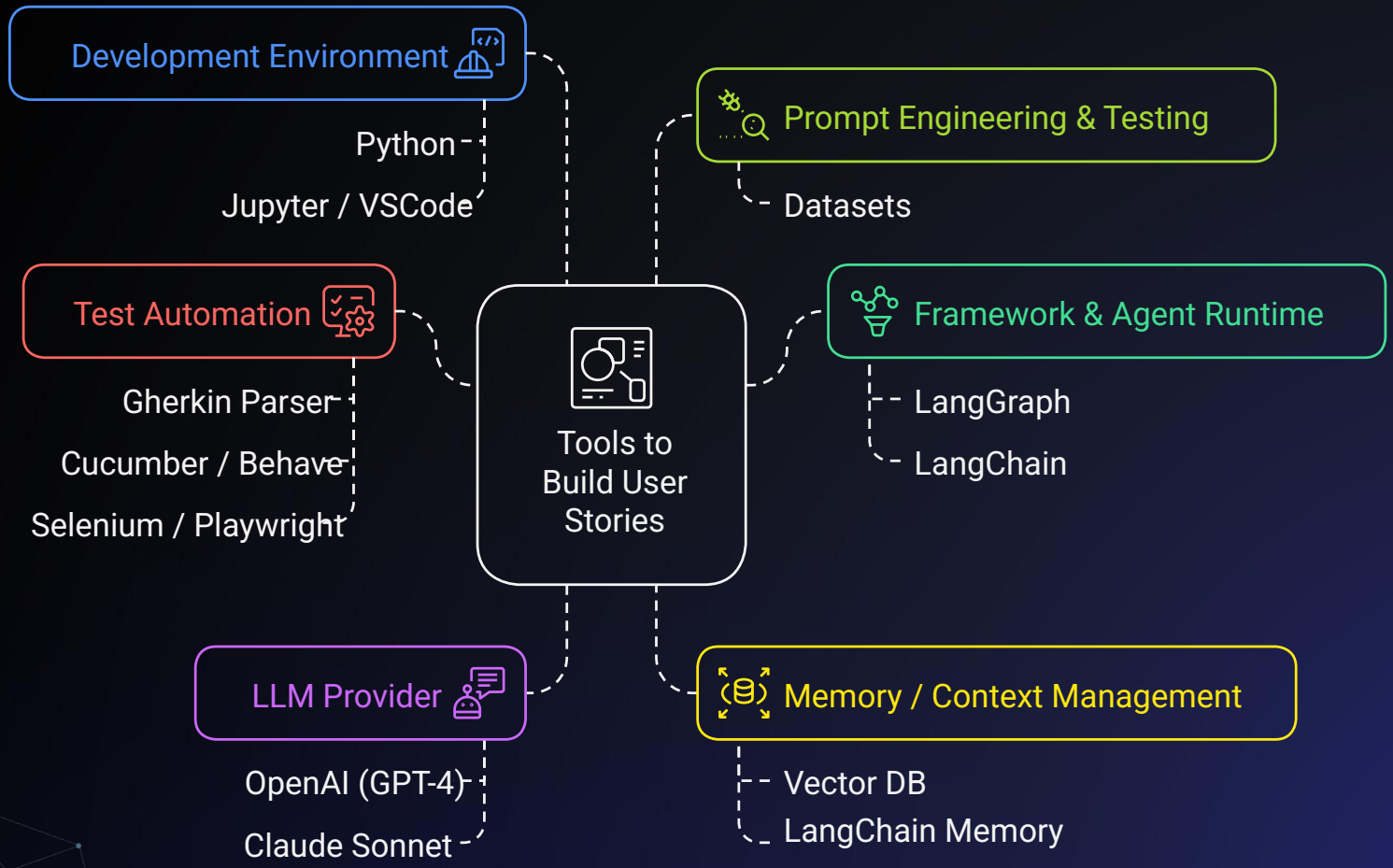
BDD Generator

Agent that creates BDD scenarios.

Review Agent

The agent that reviews the generated content.

Agentic AI Toolkit



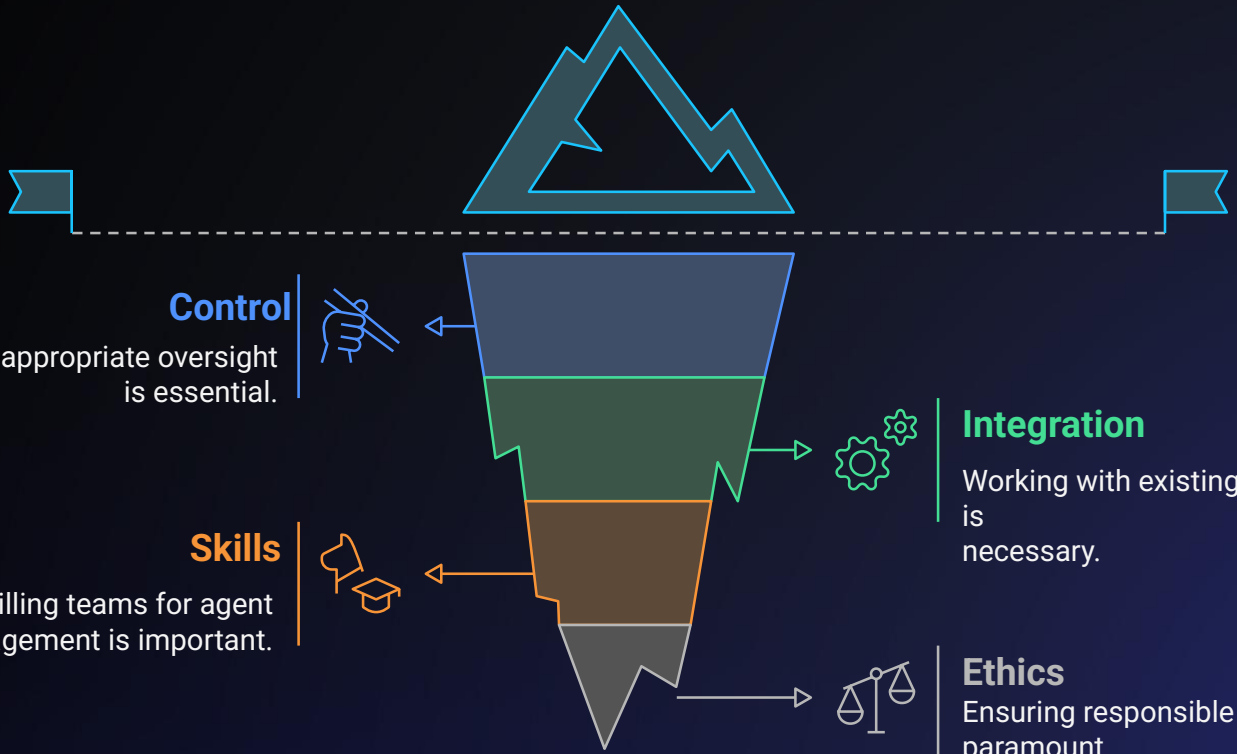
“It’s Show Time!!”

Reference Architecture

Challenges...

Explainability

Understanding agent decisions is crucial.



Control

Maintaining appropriate oversight is essential.

Integration

Working with existing systems is necessary.

Skills

Upskilling teams for agent management is important.

Ethics

Ensuring responsible AI use is paramount.

We’re not just accelerating automation; we’re architecting intelligence into the heart of quality.”

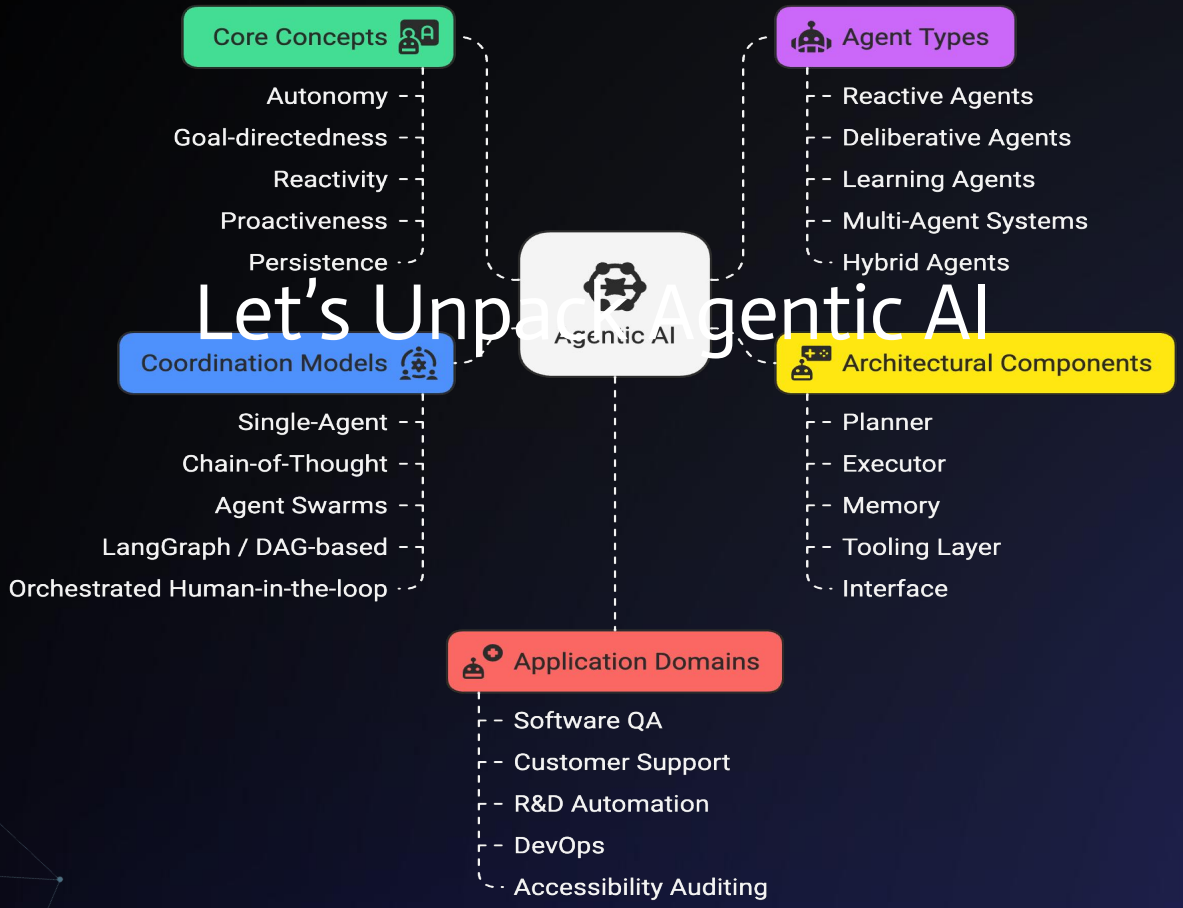
– **Manoj Kumar**

See you all next time!

Manoj Kumar Kumar

Agentic AI | Digital Transformation and Engineering leadership| Project Leadership...

What makes AI Agentic AI ‘Agentic’?

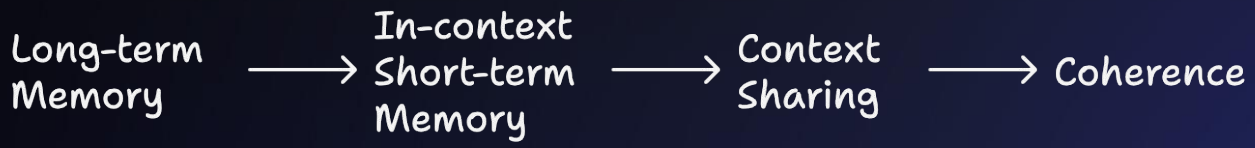


How Agentic AI works... Memory Mgmt...

Long Term: Vector databases store persistent agent knowledge and experiences

In-context Short-term Memory: Active working memory for current task execution

Context Sharing: Seamless information flow between tasks and execution periods



Evolution of Agentic AI