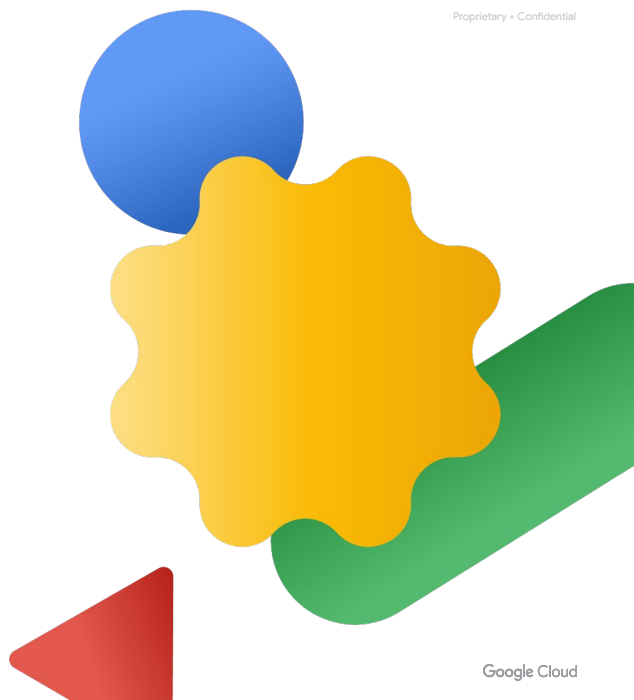


# AI agents



Let's first take a look at AI agents.

## The rise of AI Agents

**33%**

Enterprise software will incorporate AI agents

**15%**

AI agents will automate daily work decisions

Customer agents

Employee agents

Creative agents

Data agents

Code agents

Security agents

AI Agents are poised for explosive growth in the coming years:

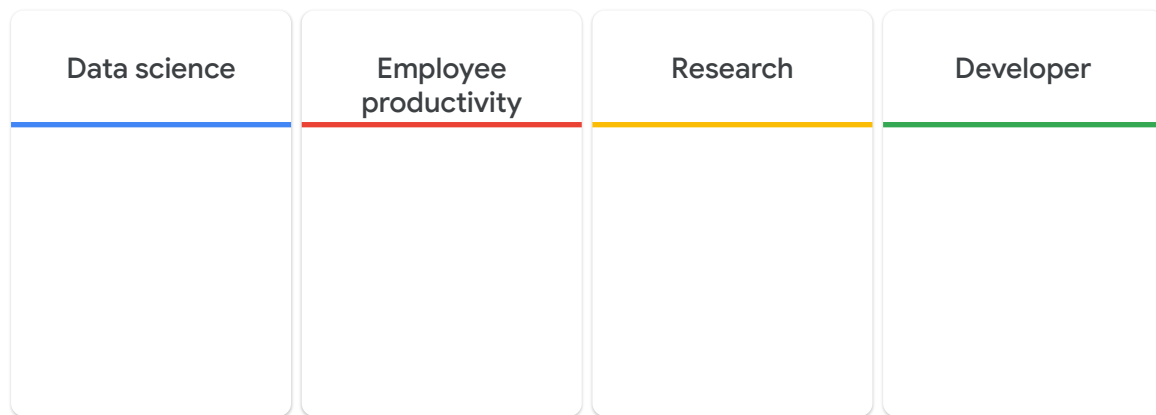
- By 2028, over 33% of enterprise software will incorporate AI agents, and
- AI agents will automate 15% of daily work decisions.

This shift towards autonomous operations will significantly transform businesses across all industries.

AI Agents are interactive partners that **help answer complex questions and complete tasks.**

AI Agents are interactive partners that help answer complex questions and complete tasks.

# AI Agents



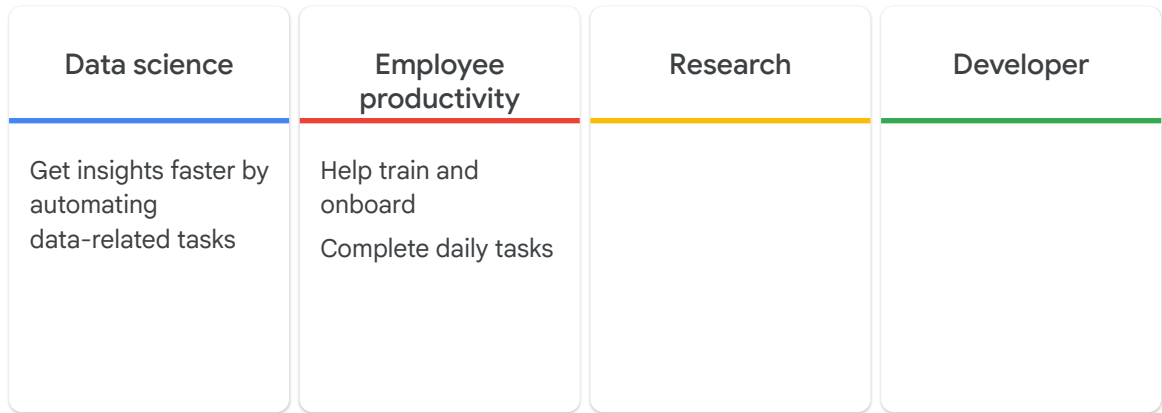
There are some key areas where AI agents are already having a big impact.

# AI Agents



AI agents enable data scientists to get insights faster by automating data-related tasks like creating datasets, spotting anomalies in data, and generating visualizations.

# AI Agents



They assist employee productivity by helping train and onboard, complete daily tasks such as underwriting, verifying claims, and processing returns.

# AI Agents

Data science	Employee productivity	Research	Developer
Get insights faster by automating data-related tasks	Help train and onboard Complete daily tasks	Quickly answer questions using proprietary data	

AI agents help research analysts quickly answer questions using proprietary data, such as summarizing research, recalling past events, and pointing human researchers towards useful lines of thinking.

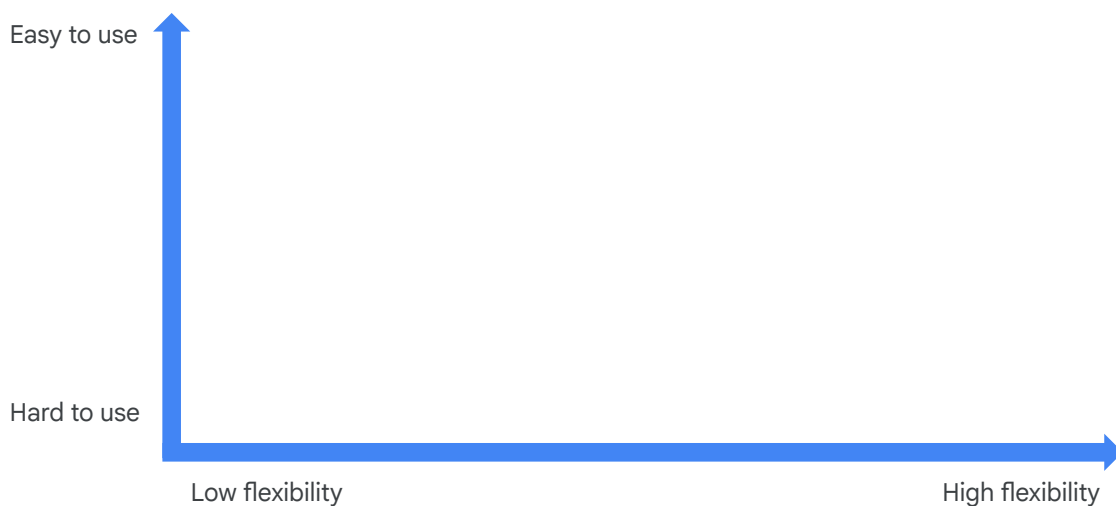
# AI Agents

Data science	Employee productivity	Research	Developer
Get insights faster by automating data-related tasks	Help train and onboard Complete daily tasks	Quickly answer questions using proprietary data	Support completing software development tasks

And they can help developers complete software development tasks, including designing systems, writing code, logging bugs, creating tickets, and debugging.



## Higher abstraction makes systems easier to build

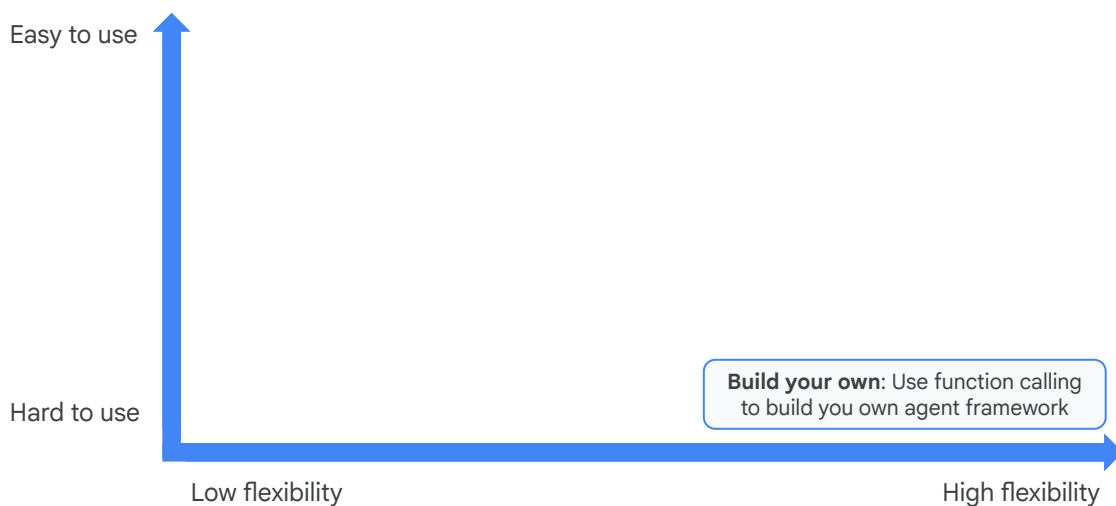


Google Cloud

Developers can build agents at their preferred level of abstraction. There are a range of methods for agent building that range from highly customizable and flexible, which require more effort for configuration and implementation, to very easy-to-use, out-of-the-box solutions that offer very little customization and fine tuning possibilities.

Let's look at some examples.

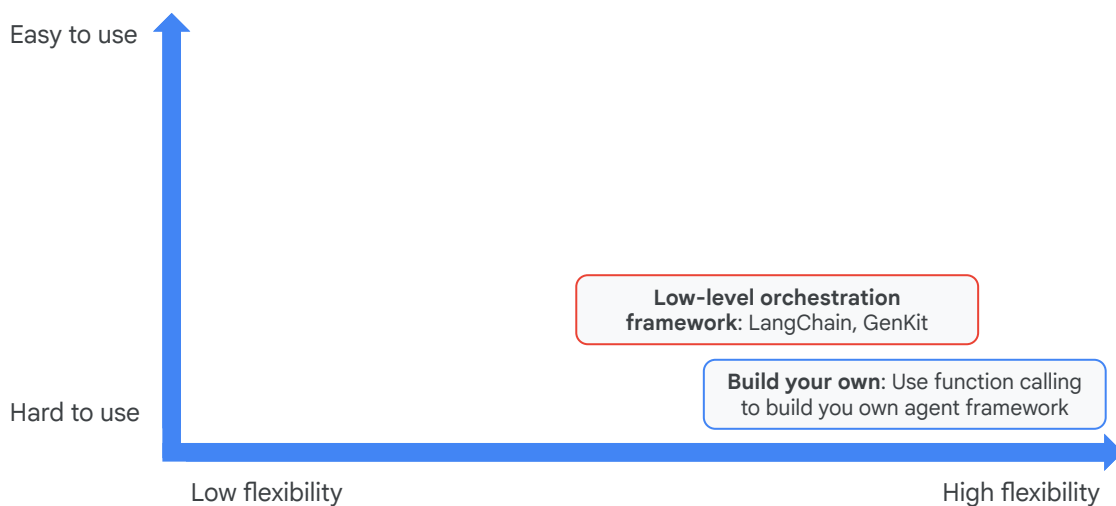
## Higher abstraction makes systems easier to build



Google Cloud

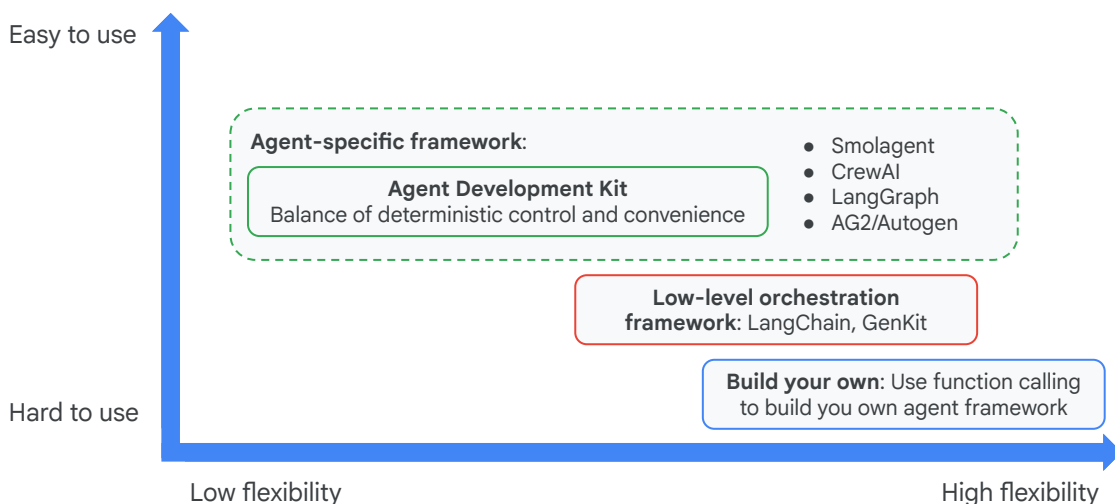
- You can build a bespoke custom agent framework, completely built to your own specific needs, using Vertex components like function calling and Gemini.

## Higher abstraction makes systems easier to build



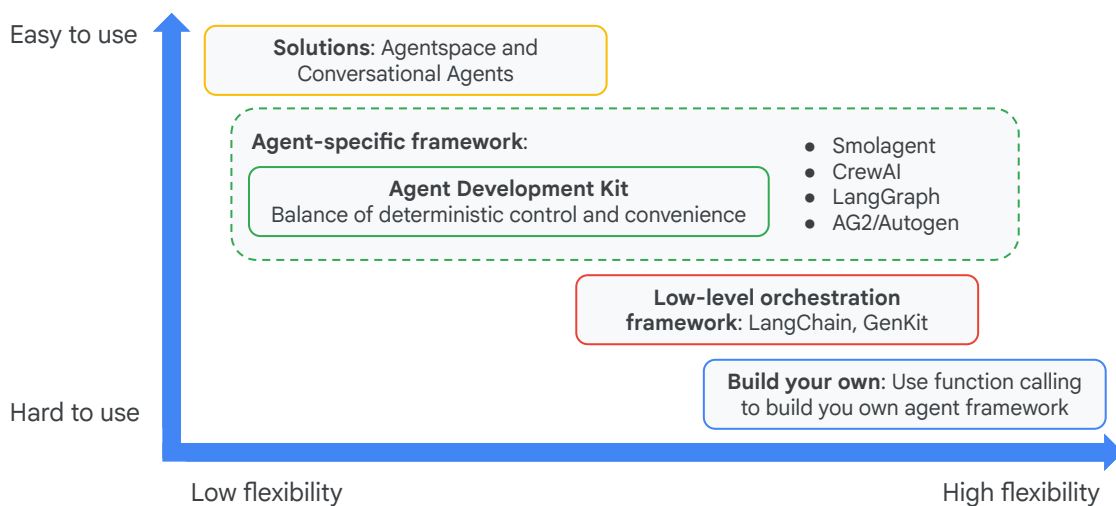
- You can build custom agents with a low level orchestration framework, like LangChain or GenKit.

# Higher abstraction makes systems easier to build



- Or you can build an agent-specific framework, using Agent Development Kit, for balance of deterministic control and convenience, providing more support, to allow you nearly as much freedom as lower-level tools, while making it much easier to build and evaluate complex multi-agent systems.
- Other agent-specific frameworks include Smolagent, Crew AI, LangGraph and AG2 or Autogen.

# Higher abstraction makes systems easier to build



- Finally, you have the out-of-the box solutions, such as Agentspace and Conversational Agents, which are very easy to use, but offer much less flexibility.

## Building an agent

- ✓ Conversational agents
- ✓ Agentspace
- ✓ Custom solutions with Agent Engine
- ✓ Agent Development Kit with Agent Engine

External-facing conversational agents that can integrate with human support teams and existing telephony and communication platforms

If you want external-facing conversational agents that can integrate with human support teams and existing telephony and communication platforms, choose the Customer Engagement Suite and its Conversational Agents.

## Building an agent

- ✓ Conversational agents
- ✓ Agentspace
- ✓ Custom solutions with Agent Engine
- ✓ Agent Development Kit with Agent Engine

Internal search to accelerate knowledge exchange throughout your organization, across your drives, chat, mail, ticketing platforms, databases, including AI assistant support

If you want internal search to accelerate knowledge exchange throughout your organization, across your drives, chat, mail, ticketing platforms, databases, and more, including AI assistant support, choose Agentspace.

## Building an agent

- ✓ Conversational agents
- ✓ Agentspace
- ✓ Custom solutions with Agent Engine
- ✓ Agent Development Kit with Agent Engine

Build agents from scratch (custom)

- Google Gen AI SDK or LangChain

If you want to build something custom, you can use basic building blocks and start building from the ground up, for example with the Google Gen AI SDK or LangChain. You can deploy your custom agents to Agent Engine to benefit from its managed runtime.



## Building an agent

- ✓ Conversational agents
- ✓ Agentspace
- ✓ Open source solutions or from scratch with Agent Engine
- ✓ Agent Development Kit with Agent Engine

Custom development with support for communication between agents through conversation history and shared state

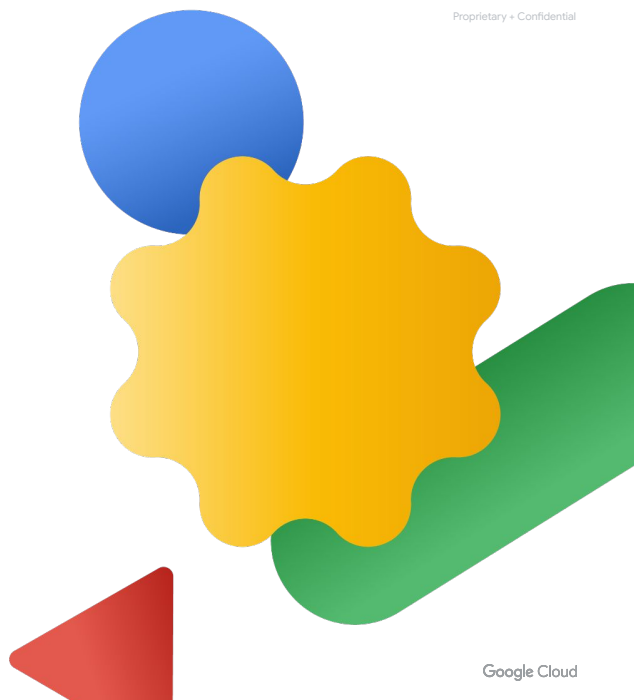
- A set of developer-friendly tools to create agents within applications
- Code-centric approach
- No AI expertise required

If you want the freedom of custom development with support for communication between agents through conversation history and shared state, Agent Development Kit makes it easier to build multi-agent systems, while handling challenges of agent communication for you.

It also frees you from infrastructure decisions through deployment to Agent Engine, a fully managed runtime, so you can focus on building logic and interactions between agents while resources are allocated and autoscaled for you.

Agent Development Kit is a set of tools designed for developers, who can create agents within their applications, with a code-centric approach, and no AI expertise required.

# Agent Development Kit (ADK)



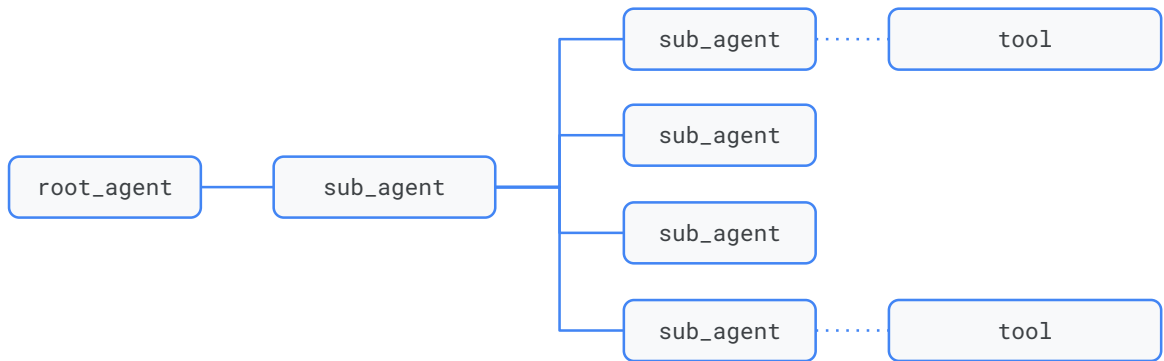
Agent Development Kit is designed to empower developers to build, manage, evaluate and deploy AI-powered agents.

Let's take a look!

A **client-side, Python SDK** enabling developers to quickly **build and customize multi-agent systems.**

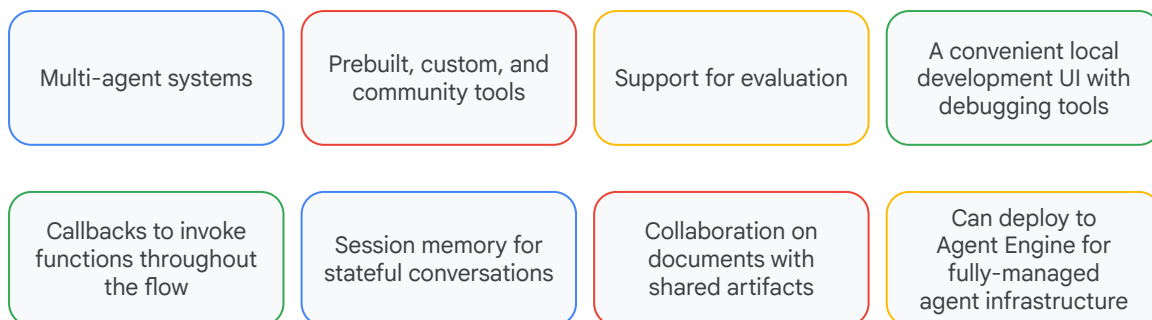
Agent Development Kit is a client-side, Python SDK, enabling developers to quickly build and customize multi-agent systems.

# Multi-agent systems



ADK's multi-agent systems allow a parent agent to steer the flow to various sub-agents to complete different, specialized tasks as required. Each sub-agent may have sub-agents of its own.

## What does the ADK include?



Agent Development Kit offers several key advantages for developers building agentic applications:

- What makes ADK special is that it's much easier for multi-agent collaboration. With multi-agent systems you can easily build applications composed of multiple, specialized agents arranged hierarchically.
- There are tools that give agents abilities beyond conversation, letting them interact with external APIs, search information, run code, or call other services. What is special about ADK is that it promotes an open ecosystem. While providing core tools, it allows developers to easily integrate and reuse tools from other popular agent frameworks (like LangChain, and CrewAI), leveraging existing investments and community contributions.
- ADK also makes evaluation easier, and
- It provides a convenient, user-friendly local development user interface, with tools to help debug your agents and multi-agent systems.
- ADK provides callbacks that can be used to invoke functions during various stages of a flow.
- It includes session memory for stateful conversations, which enables agents to recall information about a user across multiple sessions, providing long-term context (in addition to short-term session State).
- It integrates artifact storage to facilitate agent collaboration on documents.
- And, ADK can be deployed to Agent Engine, for fully-managed agent infrastructure.