

Leveraging GenAI & the power of Microsoft Cloud for SAP

A Roadmap for Digital Transformation



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Global Leader Lab for SAP
Solutions
IBM Consulting

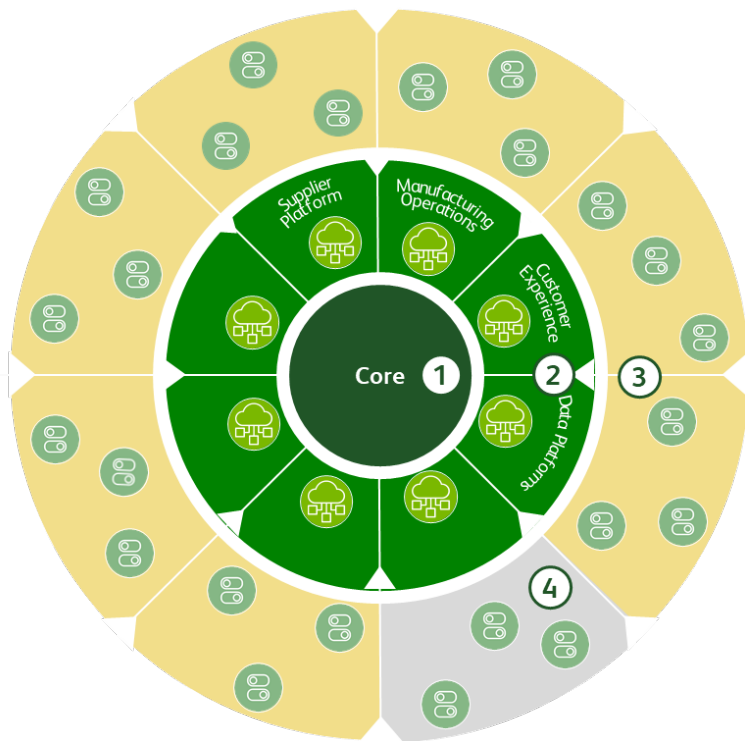


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Principal Product Manager,
Microsoft for SAP
Integration



Creating Differentiated Solutions with a Composable Service Mindset

We are evolving from the classical (ABAP) approach to meeting the differentiated needs of businesses today, to solutions that can quickly align to the business need without compromising the integrity of the back-end (clean core) system design with Low Code GenAI Solutions

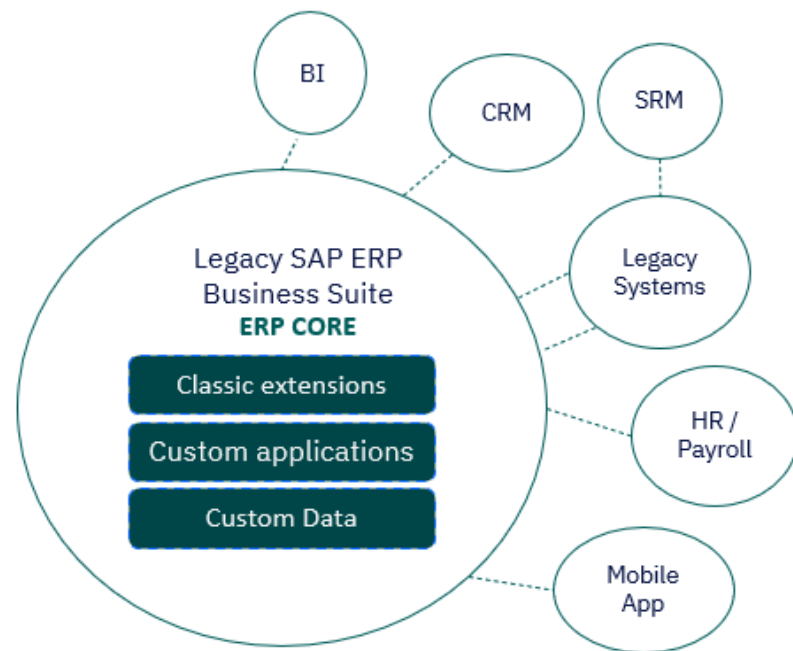


1	Clean Core ERP	Description We deploy a modern and industry SAP enterprise resource planning (ERP) system, that is lean and global, focused on highest adoption of standard (clean core)
2	Augmented with Best-of-Breed Platforms	We keep the core clean by connecting best for purpose (Cloud) enabled software platforms that are proven and cover business processes end-to-end
3	Innovated with Low Code Solutions to drive Market Differentiation	We develop innovative and differentiating digital products deployed at scale and speed ("plug and play") to nurture market leadership using Low Code and out of the box Generative AI solutions

A composable and clean ERP core is essential to drive more business agility and enable plug and play GenAI applications

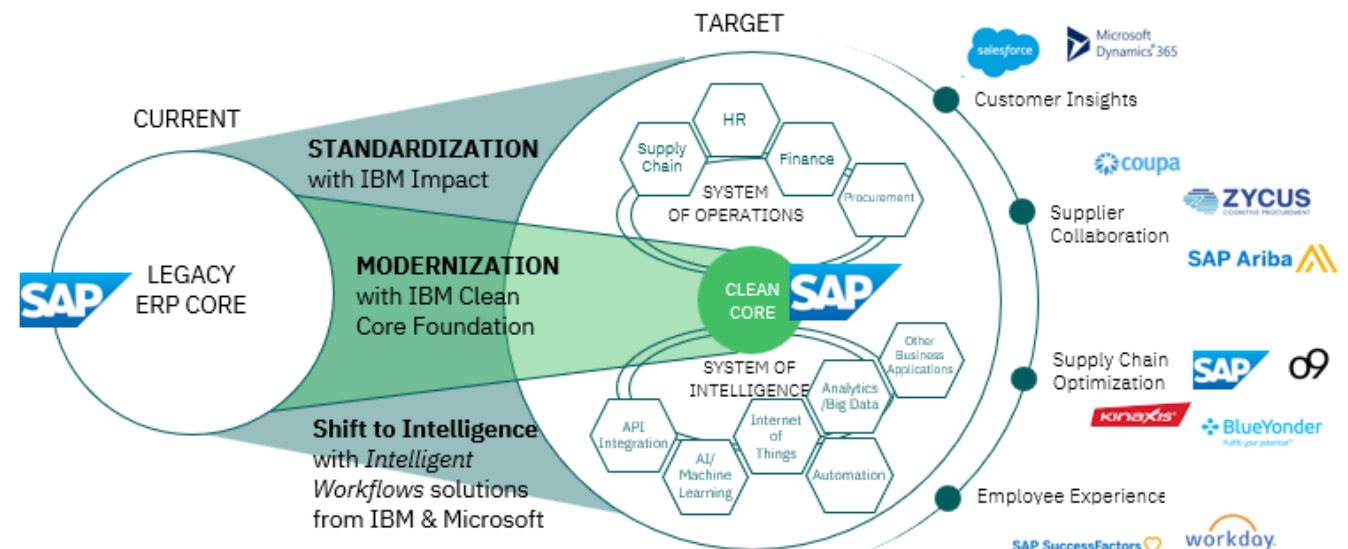
Legacy ERP Approaches

Traditional ERP approaches led to over-engineering of the core solutions as the approach to meet the business requirement

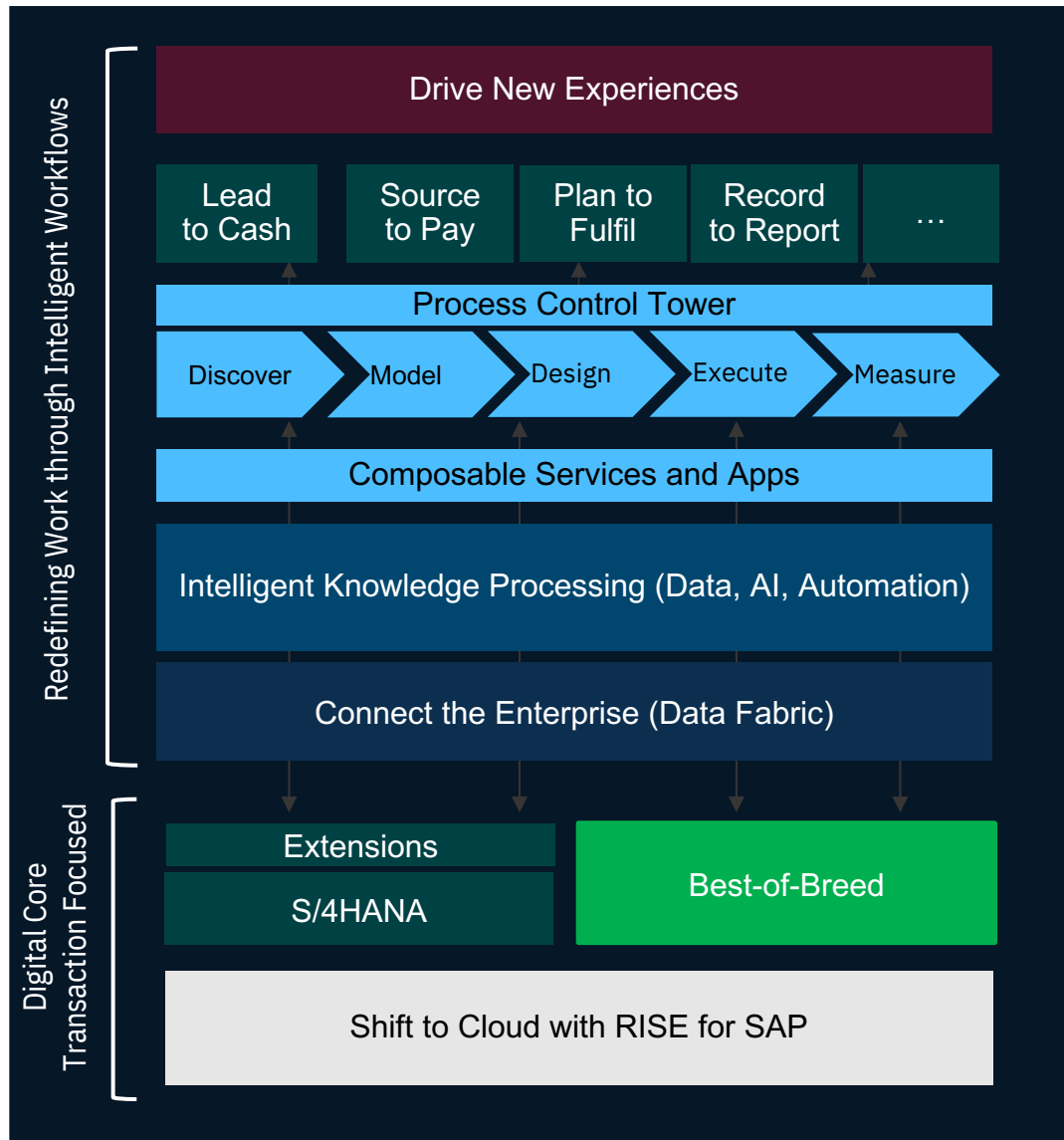


Composable & Clean Core ERP Approaches

Modern approach focuses on keeping the core clean (harmonized across the business) with business differentiation delivered through best-of-breed applications and composing new digital transformation outcomes that leverage the full power of cloud platform capabilities



This approach requires a new way of working and architecting your ERP landscape: from Transaction to Business Platforms



Experience Led Approach

Evolve from application-silos to enterprise grade experiences...from manual to automated interaction, improving productivity and user experience

Process Control Tower (end to end intelligent workflows)

Orchestrated end to end workflows across multiple platforms with embedded intelligence and continuous insights

Composable Services and Apps

Shift Differentiation from the old approaches of enhancing in-core applications, to new cloud native development with low-code technologies

Intelligent Knowledge Processing

Apply the power of AI (e.g. LLM, Content Intelligence) to drive automation and insights

Connect the Enterprise (Data Fabric)

Lean ERP places more focus on Enterprise approaches to Data and Integration. Enable Data Products across the ERP landscape through a self-serve Data Platform

Keep the Core ERP Clean & Lean (Modern Application Architectures)

Move away from Enhancing ERP to balance this with best-of-breed solutions to meet the business functional requirement



"This is the single most mind-blowing application
of machine learning I've ever seen."

Mike Krieger, Co-founder, Instagram

A screenshot of the Visual Studio Code editor interface. The editor is open to a file named "MicrosoftGraph.js". The code is written in JavaScript and includes comments in English. The code defines a "routes" object with "login" and "logout" functions, and a "getAccessToken" function. It also initializes the "MicrosoftGraph.Client" and sets up the "authProvider". The code is as follows:

```
JS MicrosoftGraph.js
routes > JS MicrosoftGraph.js
5
6
7 // Handle login and logout buttons
8 function login() {
9   authContext.login();
10 }
11 function logout() {
12   authContext.logout();
13 }
14
15 // Get the access token
16 function getAccessToken() {
17   return authContext.getCachedToken('c24f835c-1ff6-4dfa-b78d-c75a29ad2c3c');
18 }
19
20 // Set up the Microsoft Graph client
21 var graphClient = MicrosoftGraph.Client.init({
22   authProvider: (done) => {
23     done(null, getAccessToken());
24   }
25 });
26
27 // Use the Microsoft Graph client to get the user's Outlook Calendar
28
29
30
```



Today, over 27,000
organizations and over 1.5
million developers are using
GitHub Copilot.

Thomas Dohmke
■ GITHUB CEO

Work Shifting

GITHUB'S APPROACH TO GENERATIVE AI



46% of new code is now written by AI

55% faster overall developer productivity

75% developers feel more focused on satisfying work

A screenshot of a code editor interface with three tabs at the top: "sentiment.ts" (selected), "write_sql.go", and "parse_expenses.py". The "sentiment.ts" tab contains TypeScript code for a function named "isPositive". The code uses "fetch-h2" for HTTP requests and returns a boolean based on the sentiment label from a JSON response. A blue highlight box covers the "fetch" call and its associated options. At the bottom of the editor, a blue button with the GitHub Octocat icon and the text "Copilot" is visible.

```
1 #!/usr/bin/env ts-node
2
3 import { fetch } from "fetch-h2";
4
5 // Determine whether the sentiment of text is positive
6 // Use a web service
7 async function isPositive(text: string): Promise<boolean> {
8   const response = await fetch(`http://localhost:3000/sentiment`, {
9     method: "POST",
10    body: `text=${text}`,
11    headers: {
12      "Content-Type": "application/x-www-form-urlencoded",
13    },
14  });
15   const json = await response.json();
16   return json.label === "pos";
17 }
```

Copilot



Microsoft Copilot

Your everyday AI **companion**

Natural Language



+



+



+



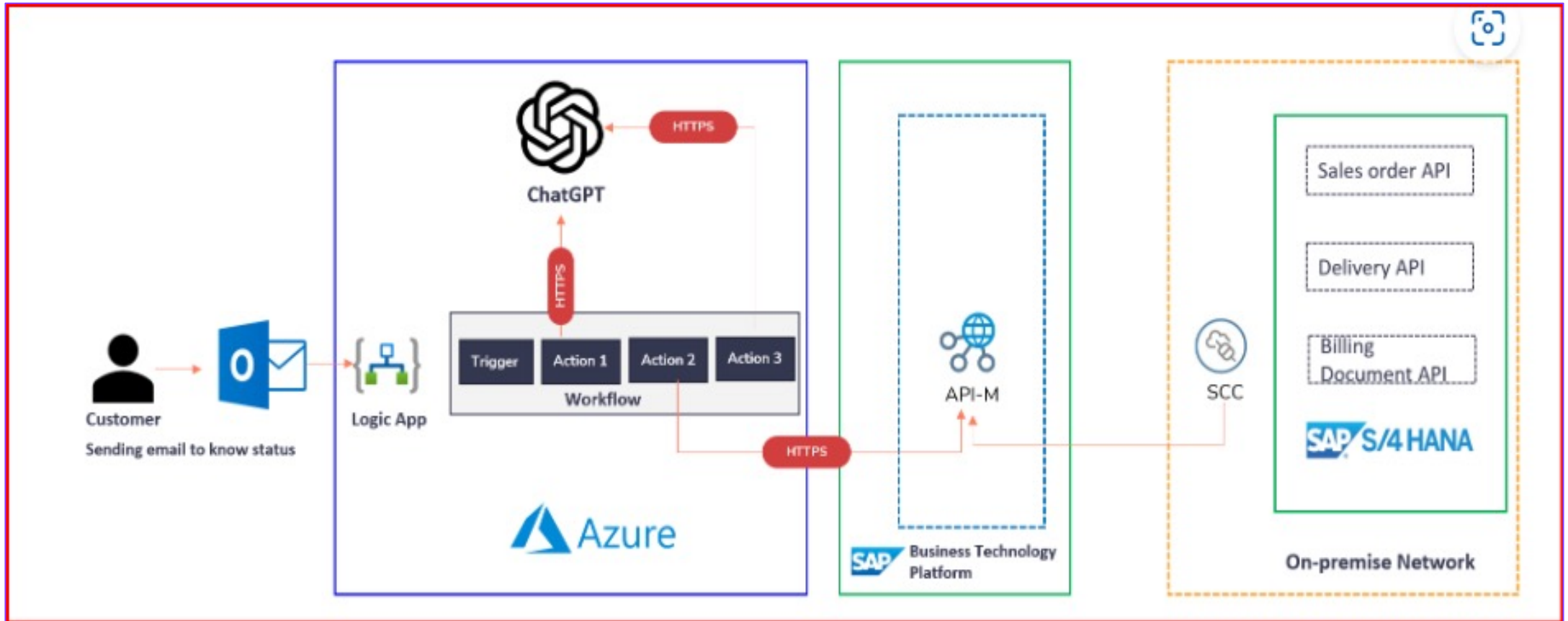
Large Language
Models (LLMs)

Web
grounding

Commercial
data protection

The
Internet

Outlook Integration



Intelligent recap in Copilot

Intelligent recap

Product roadmap discussion Chat Files Details Recap +

Jan 21, 2023 10:00 - 11:00 Open in Stream Copilot

Product Roadmap Discussion

2023-05-13 02:12 UTC

Mona Kane 11:23 / 1:48:42

Speakers # Topics Chapters

Mona Kane

Babak Shammass

Daniela Mandera

Amanda Brady

Bruno Zhao

Show all 8 speakers

Is this info useful?

Content See all

Product Roadmap... Marketing budget... Marketing demo f...

Notes AI notes Mentions (3) Transcript

Generated by AI. Be sure to check for accuracy. Copy all

Meeting notes

- > **Serena** wants to look at the product roadmap before she and **Danielle** commit to more feature enhancements.
- > **Danielle** explains that they are on track for new product release in December. But they will need to keep an eye on beta testing results. She will follow up on that.
- > **Danielle** explains that they are managing the capacity well. There could be a problem if they get a surge of users. **Babak** will make sure that they have the necessary provisions to handle an influx of users if the need arises.

Are these notes useful?

Follow-up tasks

- **Danielle** will follow up on feature enhancement prioritization
- **Jon Shammass** will double check with **Amanda** regarding the ETA for the new product

Copilot in Teams

Create a table with pros and cons of option 1

Copilot 11:43 AM

Pros and cons of option 1: Drive campaign traffic to generic Sign up page:

Pros	Cons
Wider range of potential leads	Less persuasive
Simpler, faster sign-up process	Difficult to segment audience
Streamlines multiple campaigns	Less engaging

Copy

References

Elaborate on each pro and con.

List more options.

Ask a question about this meeting

Built-in and automated

Standardized

Video, speaker, and chapter markers

Available after meeting only

On-demand

Based on unique prompts

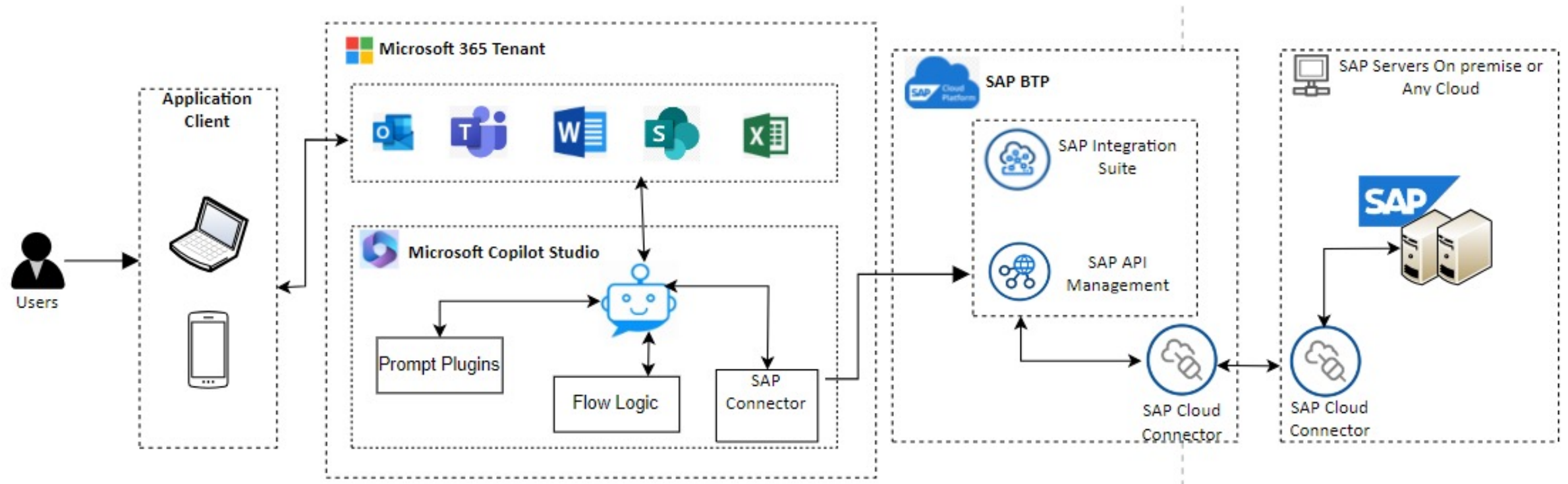
Conversational interaction, with citations.

Available real-time (during and after meeting)

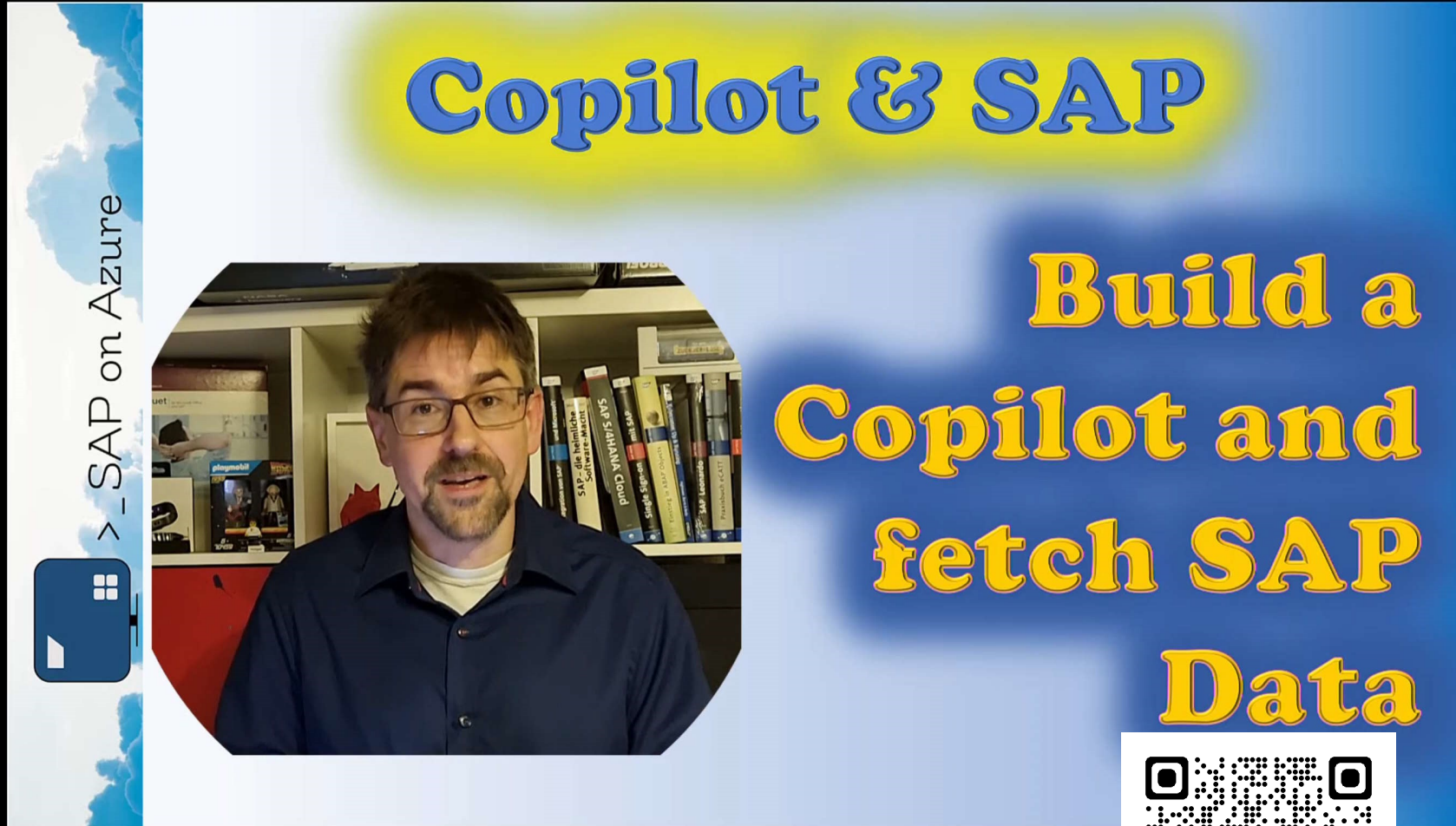
Use **built-in meeting summaries** and **ask any question** about the meeting

*Intelligent recap is also available in Teams Premium

Teams copilot Integration

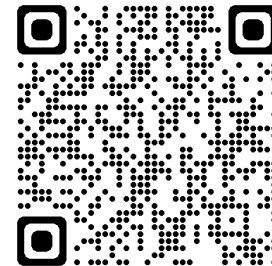


First SAP Bot Development with Copilot Studio



- 10 minutes is all you need
- Start using Copilot Studio and create a simple bot
- Create a low-code plugin to call Power Automate Flow
- Fetch product data from SAP

<https://www.youtube.com/watch?v=ZD-i9L5mV8c>



Azure Integration Pattern: Enterprise SAP (On-Premise and Private Cloud) to Azure Open AI using Azure SDK or API Management



Description

This pattern describes how the S4HANA system can connect with Azure OpenAI and use LLM models like GPT4 and GPT3.5 in its use-cases. The Azure SDK is a plugin that can be installed on S4HANA systems to make the Azure OpenAI services locally accessible from SAP GUI. Alternatively, SAP Integration Suite IFLOWs can be used to access the Azure OpenAI services in API mode.



Characteristics

Connectivity from S4HANA system to Azure OpenAI services using freely available plugin – Azure SDK

Custom IFLOWs on SAP Integration Suite can be used to work with Azure OpenAI services using API Calls. Other Azure services have Native adapters on Integration suite.



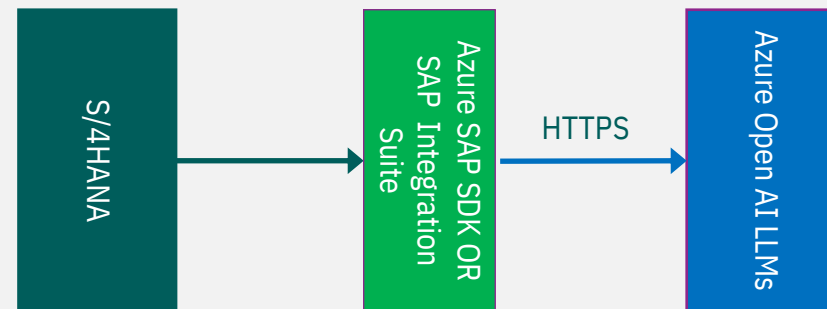
When to apply and restrictions

Azure SDK based connections can be applied when there are multiple use-cases using native SAP technology like screen flows, AL11 file directories, batch jobs etc that need to utilize the OpenAI services.

Integration Suite based IFLOWs can be used when there are few use-cases with small transformations and there is minimal / no usage of SAP GUI native technology.



Pattern



Azure SDK:

Add h

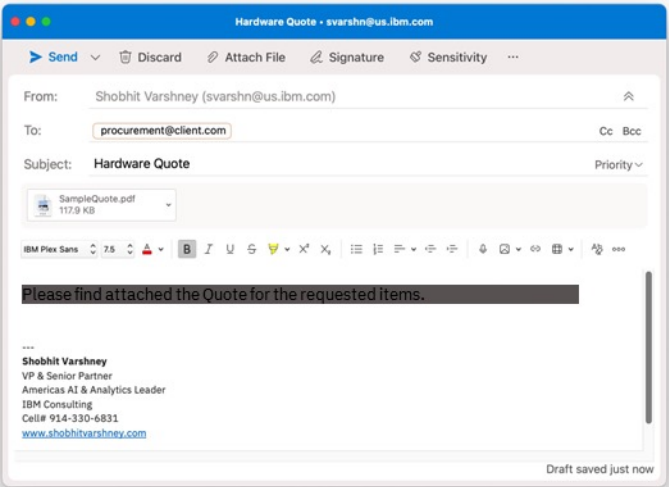
The connection and service is triggered by the program on S4HANA system using the pre-defined functions on Azure SDK.

Integration Suite:

The connection and service is triggered through outbound call from S4HANA system to the IFLOW based on use-case

Contract Validation - Gen AI for SAP Usecases

Emails sent from vendors



Quotes attached for multiple items

REMIT PAYMENT TO:
ABC LLC
PO Box 123456
Seattle WA 98124-1740

PLEASE SEND PURCHASE
ORDERS DIRECTLY TO YOUR
ABC LLC ACCOUNT MANAGER
VIA FAX OR EMAIL

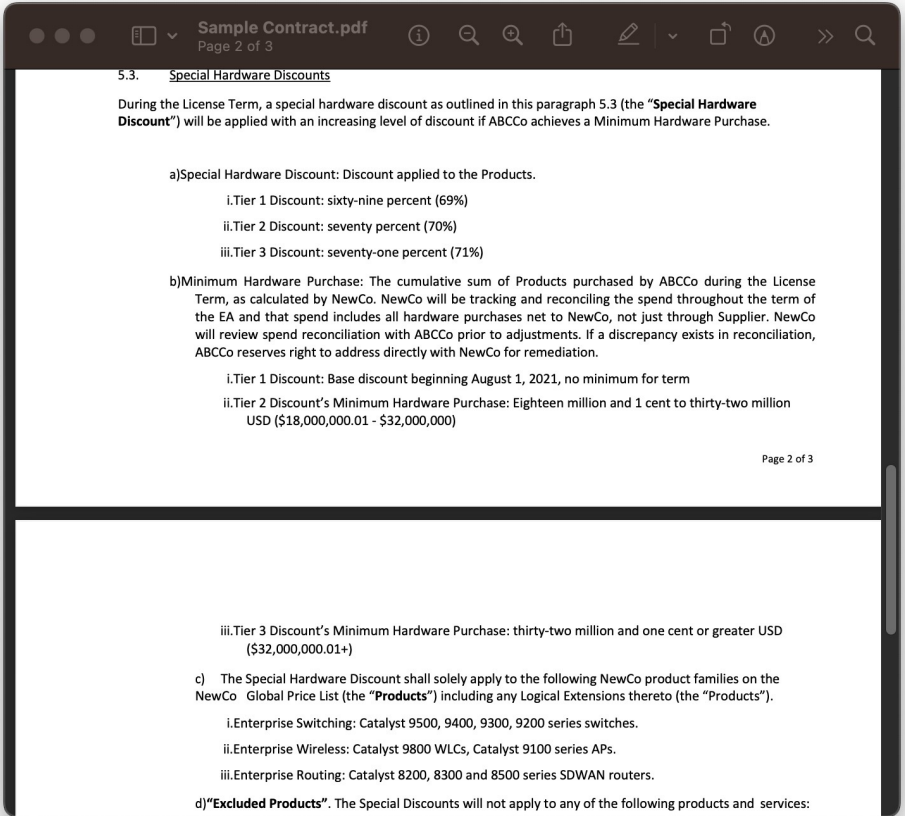
Jane Doe
Account Manager, GJM
Phone: 123-456-3746
Email: jane.doe@ABC.com

Item #	Qty	Mfr. Name	Description	Manufacturers Part #	Unit Price	Total	Discount
23487JKL	2	NEWCO SYSTEMS INC.	Catalyst C8300-Router	GSS8300-R-1	\$6,100.00	\$9,200.00	71%
56890GHI	2	NEWCO SYSTEMS INC.	Advanced Pluggable for North America	GSSP006-US-1	\$428.00	\$758.00	0%
24584XON	2	NEWCO SYSTEMS INC.	Catalyst 9800-L Wireless	GSS9800-LP1	\$2,684.00	\$5,368.00	69%
320456FGN	2	NEWCO SYSTEMS INC.	Catalyst 9500	GSS9500-MK-4	\$10,905.00	\$18,400.00	71%
456900LKP	2	NEWCO SYSTEMS INC.	NewCo pluggable SSD storage	GSSSD002-HG-6	\$1,180.00	\$1,180.00	0%
450XAAJ	11	NEWCO SYSTEMS INC.	Catalyst 9300 48-port Network	GSS9300-XM-F	\$685.00	\$7,485.00	69%
9085THD	2	NEWCO SYSTEMS INC.	AC CONFIG 4 POWER SUPPLY	GSSAC004-CP-4	\$821.00	\$1,642.00	0%
320456FGN	2	NEWCO SYSTEMS INC.	Catalyst 9500	GSS9500-MK-4	\$10,905.00	\$18,400.00	71%
456900LKP	2	NEWCO SYSTEMS INC.	NewCo pluggable SSD storage	GSSSD002-HG-6	\$1,180.00	\$1,180.00	0%

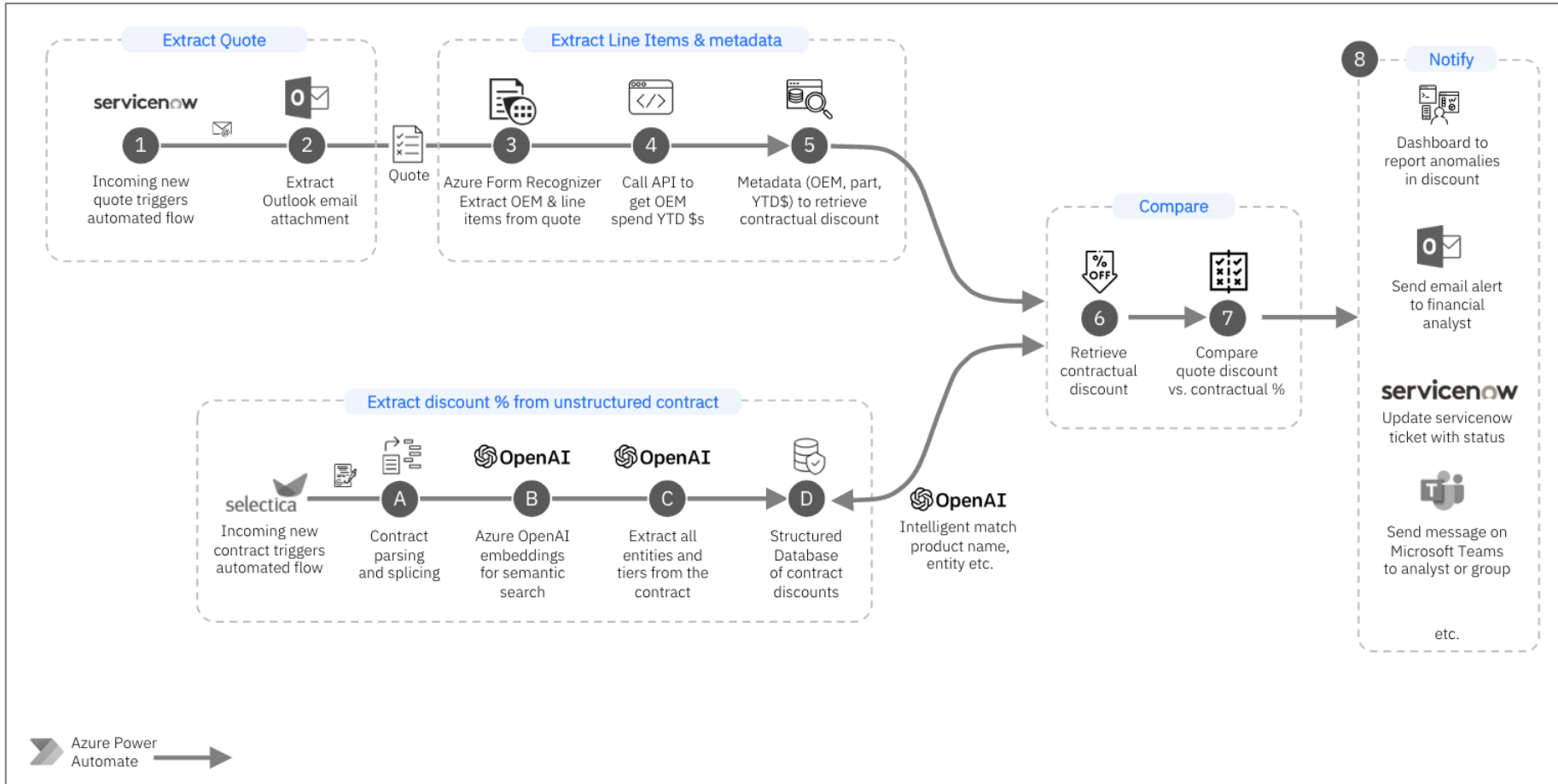
Manually review each quote and contract to verify discount per item



Lots of unstructured Contracts



Example of efficient evaluation of supplier proposals using Azure OpenAI



- Automatically extract and validate quotes from vendor offers
- Validate discounts and other terms and conditions defined in existing contracts (> 50 pages long)
- Automatically generate email responses to vendors highlighting potential differences between quote and agreed terms and conditions



*Ensure that artificial
general intelligence (AGI)
benefits humanity.*



*Empower every person and
organization on the planet
to achieve more*

GPT-3

Generate and Understand Text

Codex

Generate and Understand Code

DALL·E

Generate images from text prompts



Azure AI Portfolio

Azure AI Studio

Unified user interface (UI), SDK, CLI

Azure AI Services

Vision
Speech
Language / Translation
Document Intelligence
Azure OpenAI
Content Safety

Azure AI Search

Retrieval Augmented
Generation (RAG)
Semantic
Vector

Azure Machine Learning

Ground
Evaluate
Deploy
Monitor
MLOps / LLMOps
Responsible AI Dashboard

Turing
Florence

GPT-4 and GPT 3.5 Turbo
Whisper

DALL-E
Embeddings

Meta Llama 2
Hugging Face

Azure Infrastructure

One place to
build and deploy
AI solutions

Comprehensive
model catalog

Production ready
lifecycle

Safe and
Responsible AI

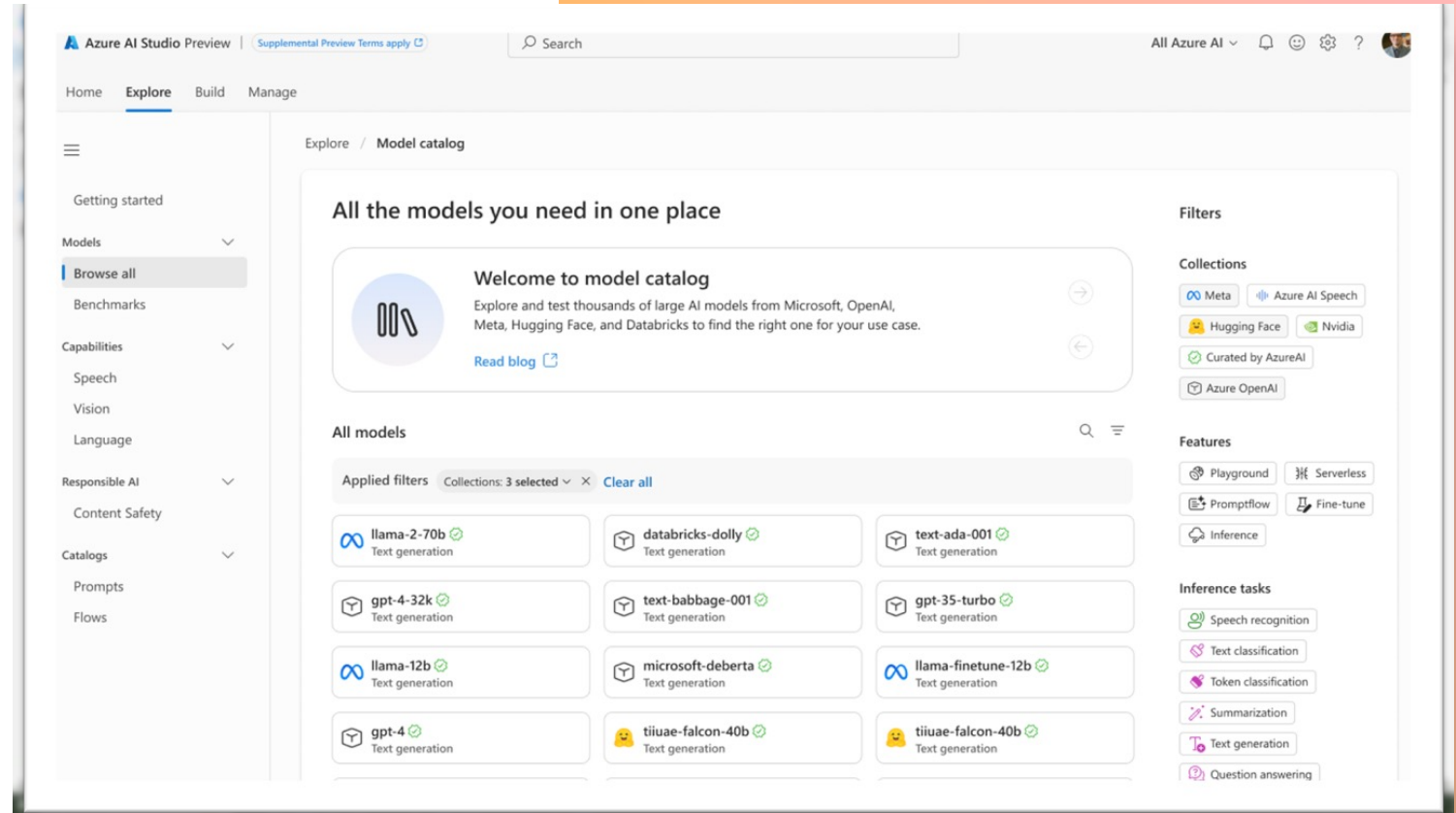
Model Catalog in Azure AI Studio

1400+ models from OpenAI, Huggingface, Meta and more.

Open-source models ready with curated fine-tuning pipelines.

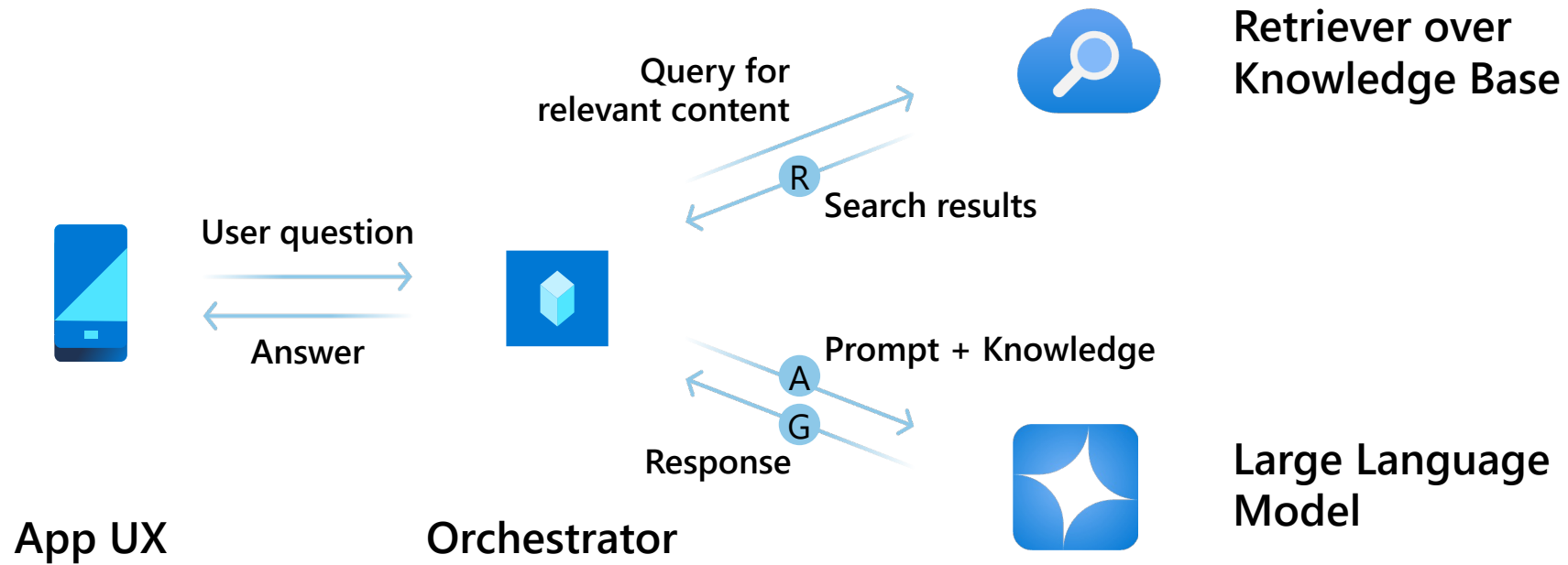
Hosted models integrate with one click to your prompt flow.

Compare models by task using open-source datasets



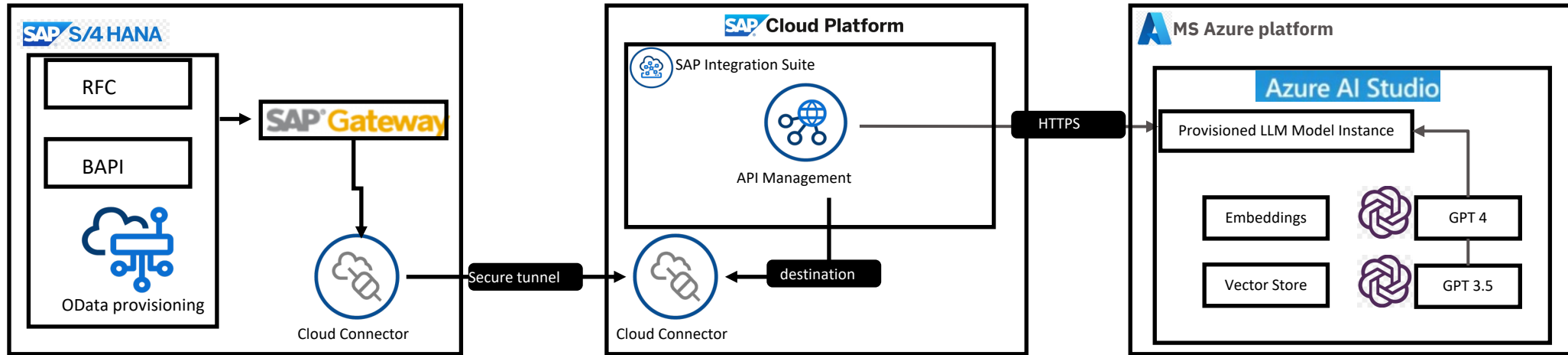
Retrieval Augmented Generation (RAG)

Anatomy of the workflow



Gen AI Reference Architecture

Option with Middleware (e.g.: SAP CPI)



Microsoft AI SDK for SAP

Easily bring AI to SAP ABAP

ABAP ready data types

Azure Active Directory and
key support

Enterprise controls



Learn more: [AI SDK for SAP | AI SDK for SAP \(microsoft.github.io\)](https://microsoft.github.io/AI-SDK-for-SAP/)

Azure Data Platform Integration Pattern: Enterprise SAP (On-Premise and Private Cloud) to Azure PowerApps using SAP ERP Connector



Description

“API Gateway: Applications connect via an API gateway to other applications. The API gateway provide security functions and enables connections between different networks. API Gateways are placed close to the backend functionality. API gateways are part of the overall API-Management landscape.

Data Gateway: APIs cannot be used; the alternative option is to connect using On-Premise Data Gateway



Characteristics

Connectivity with Standard SAP APIs using SAP Integration Suite API Management or Any other API Management tool.

On-premise Data Gateway to integrate systems not integrated with Integration Suite. This enables Power Apps to extract SAP data directly without intermediate steps.



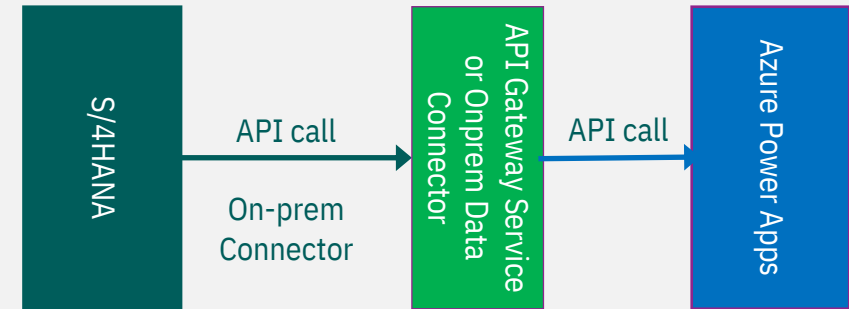
When to apply and restrictions

API based connection can be applied when, low volume high frequency real time data is needed. Standard APIs can satisfy the data requirements of Azure Power Apps application.

On-premise Data Gateway needs a plugin to be installed and managed on SAP system. Long term connection is needed. Large Data Volume is needed to be extracted from tables and CDS views and APIs are not available.



Pattern



With API Gateway connection:

The Azure Power Apps triggers the data collection.

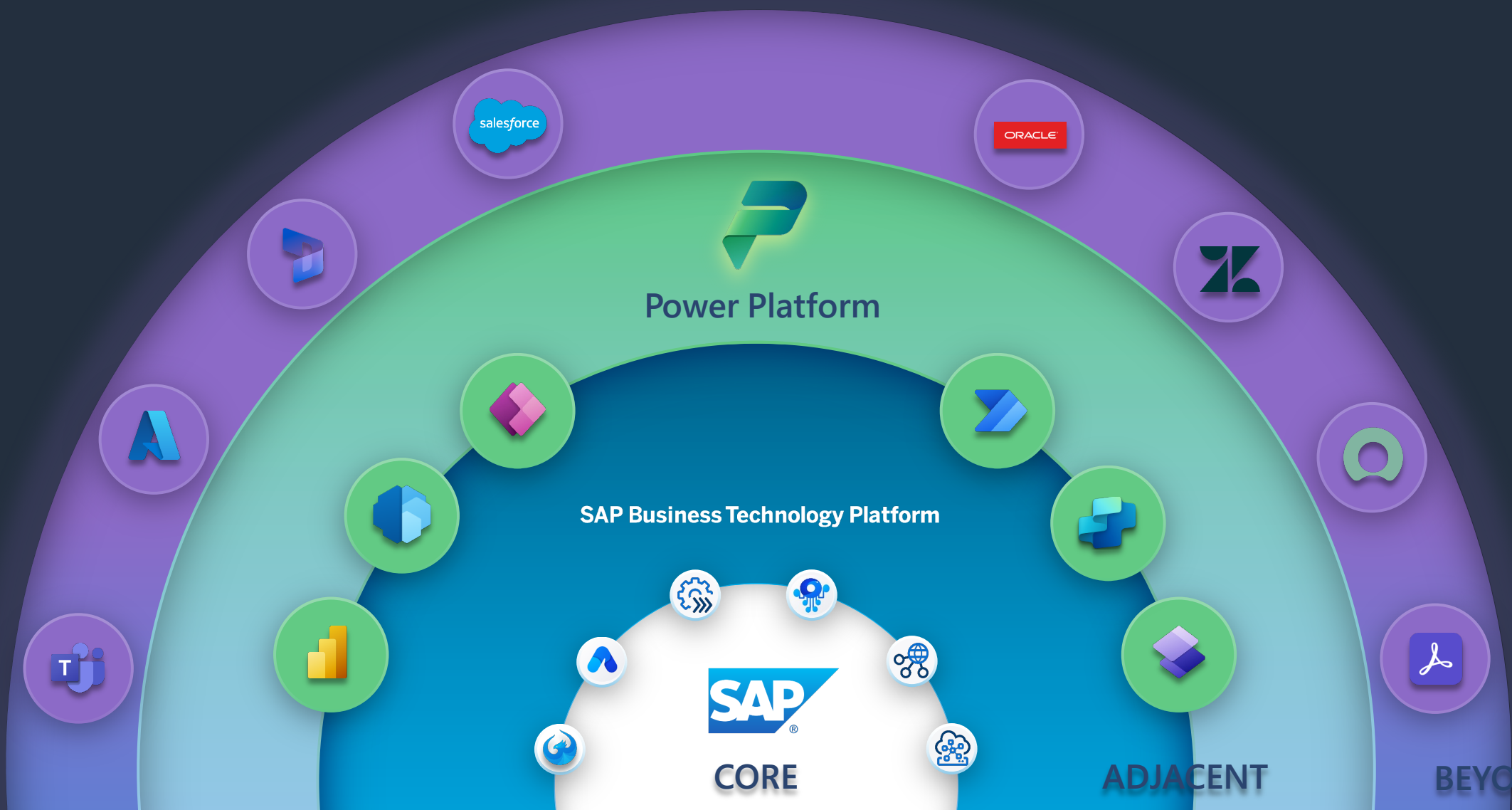
Low volume data is transferred synchronously to and fro from power apps.

With On-Premise Data gateway connection:

High volume data is needed.

Can be transferred as batch data and asynchronously.

Non-Standard data requirements.



Scalability

Security

AI

Data

Governance

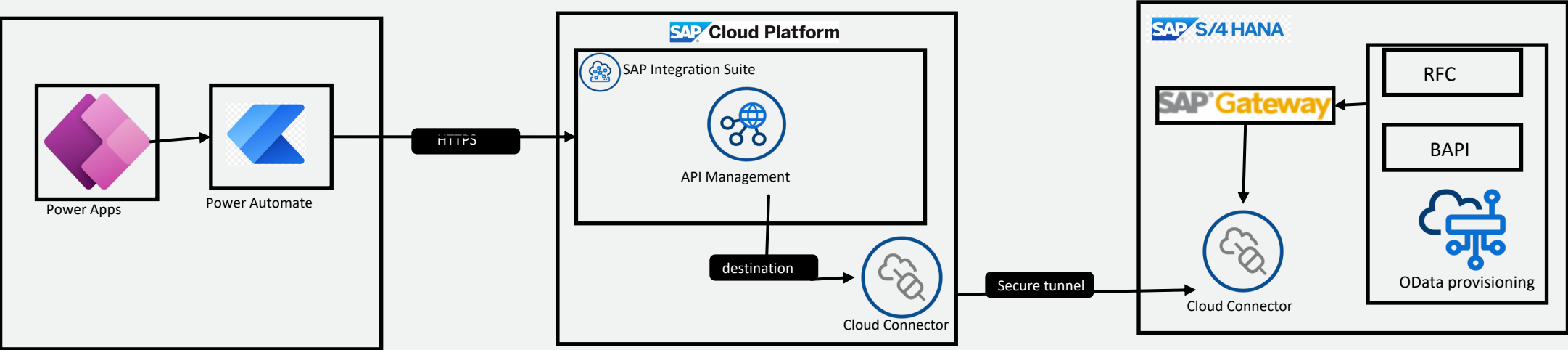
ALM

DevOps

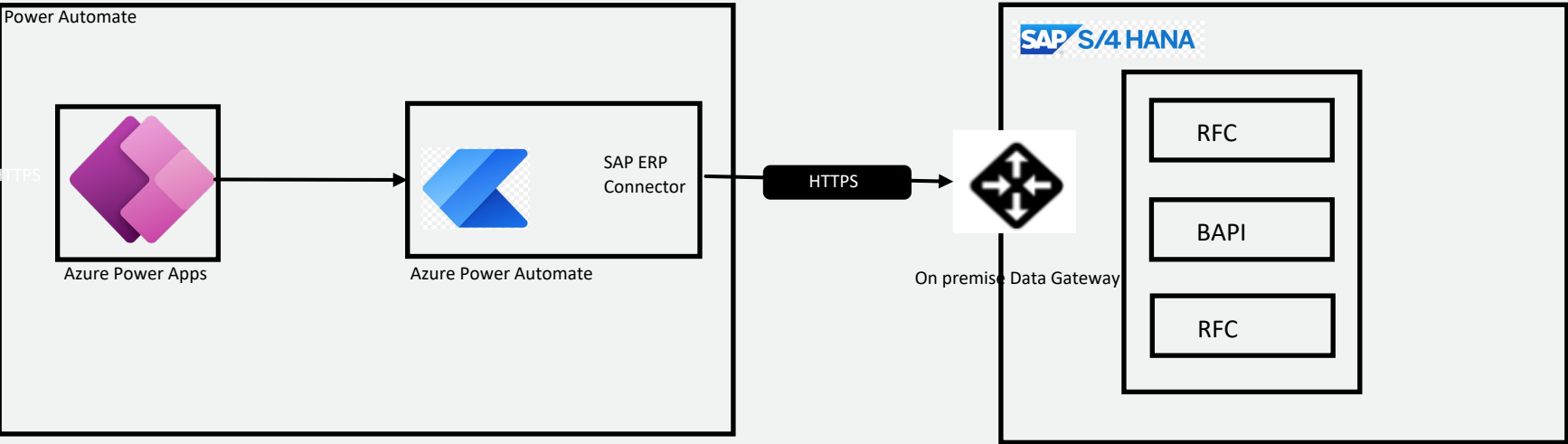


On-premise SAP to Azure power apps using API

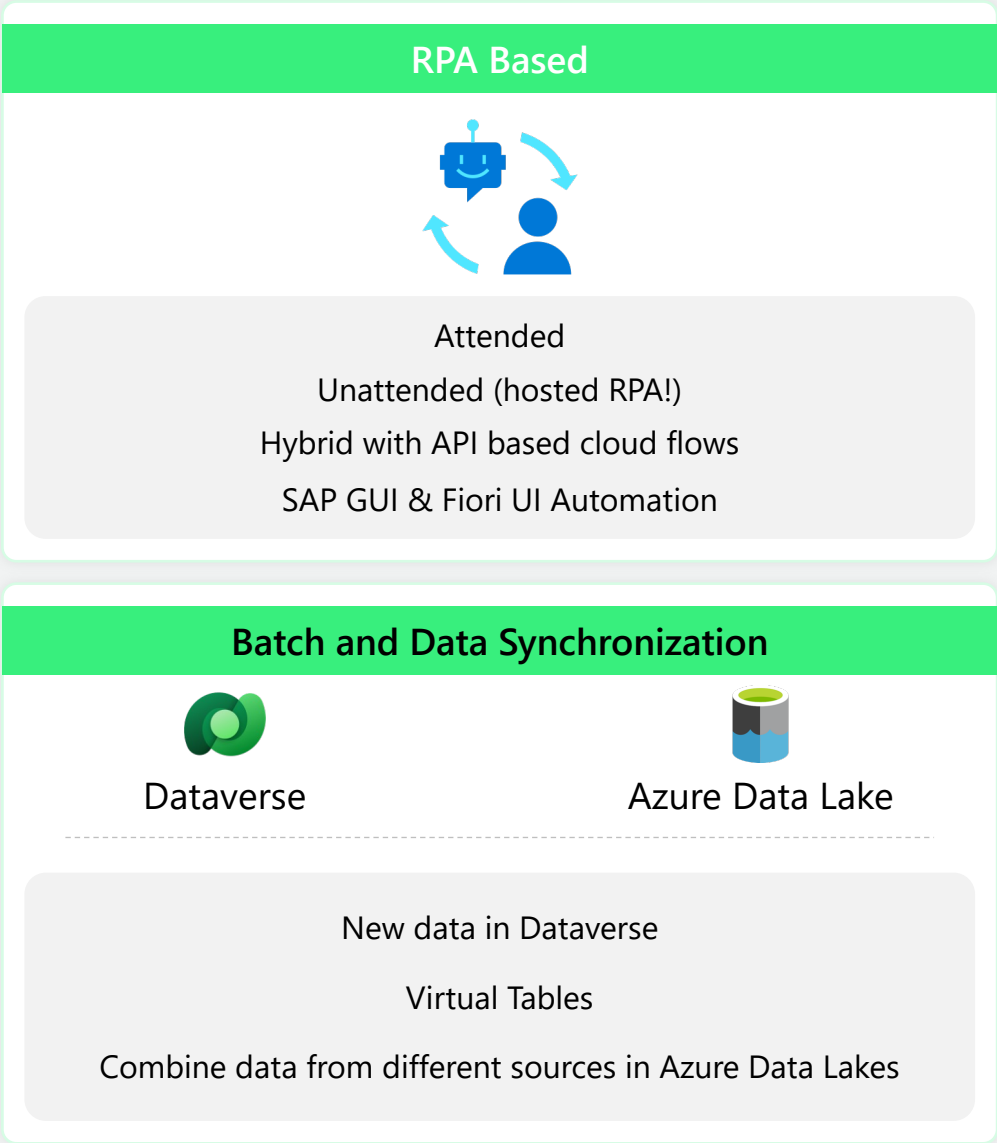
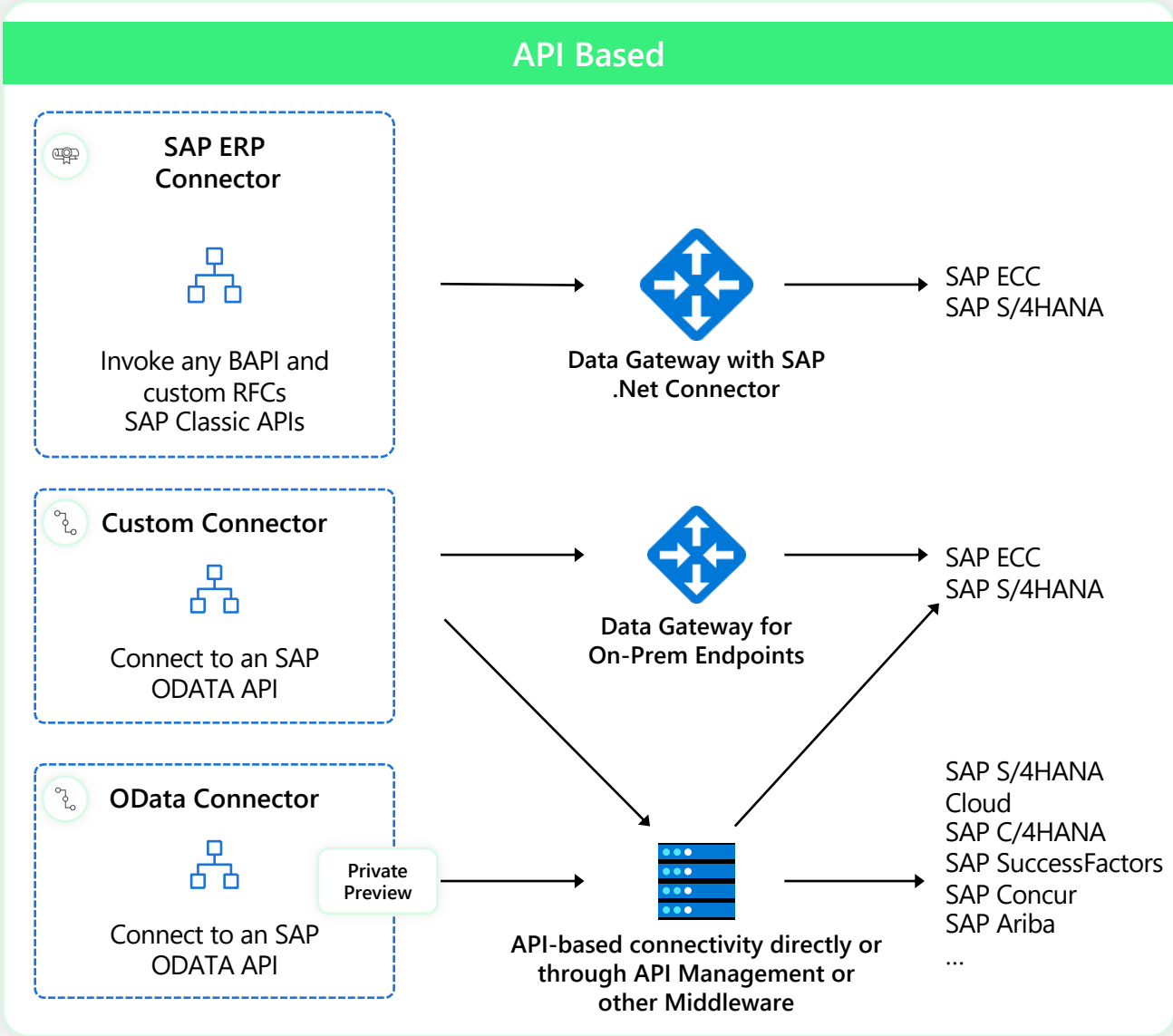
Option with Middleware (e.g.: SAP CPI)



Option without Middleware



Power Platform + SAP Integration



Bringing it all together...

Red Hat Ansible Automation Platform on Azure Marketplace

Automation from your Azure cloud to on-premises, edge, and IT resources



Runs in
your Azure cloud



Fully installed
and integrated



Fully supported
by Red Hat



Integrated to
Microsoft Azure billing



Counts toward
spend agreements

IT ecosystem automation



Network/security



ITSM



Services and workflow



Monitoring and analytics



Red Hat
Ansible Automation
Platform

Microsoft Azure

Connecting on-premise



Private cloud

Red Hat Ansible Lightspeed with IBM watsonx Code Assistant

Red Hat® Ansible® Lightspeed with IBM watsonx Code Assistant helps automation teams learn, create, and maintain Red Hat Ansible Automation Platform content more efficiently.

Get started

```
22     group: root
23     mode: '0644'
24
25     - name: Start and enable service
26       ansible.builtin.service:
27         name: cockpit
28         state: started
29         enabled: true
30
31     - name: Wait 15 seconds port 9090
32       ansible.builtin.wait_for:
33         port: 9090
34         delay: 15
35
```



IBM watsonx Code Assistant for Ansible Lightspeed: Streamlining SAP Infrastructure and Environment Management

• About Ansible Lightspeed

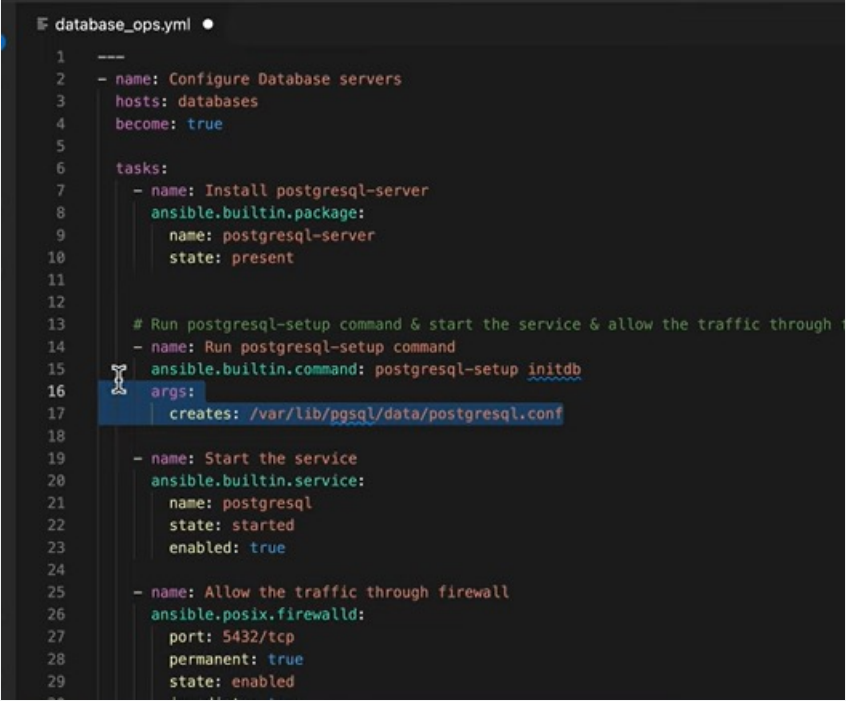
- Ansible Lightspeed enables accelerated Hybrid Cloud Automation by streamlining Application Infrastructure, Platform, Network, and Security play through Ansible code generation, code optimization, and code explanation

• Challenges

- Managing a complex IT landscape with multiple SAP servers, requiring diverse infrastructure and application support
- Significant manual effort needed for building infrastructure and setting up SAP applications
- Ensuring high-availability and disaster recovery for SAP infrastructure to maintain business continuity

• Solution

- A notable feature of this deployment was the integration of IBM Watson Code Assistant, which offered Ansible code suggestions based on natural language prompts. Watson Code Assistant facilitated Ansible code generation for automating vital tasks such as:
- SAP HANA Installation and Configuration
- Housekeeping and Cleanup
- High Availability and Disaster Recovery setup
- Key Day 2 admin activities (e.g., Kernel Upgrades, SAP Profile Updates)



```
1  ---
2  - name: Configure Database servers
3    hosts: databases
4    become: true
5
6    tasks:
7      - name: Install postgresql-server
8        ansible.builtin.package:
9          name: postgresql-server
10         state: present
11
12      # Run postgresql-setup command & start the service & allow the traffic through
13      - name: Run postgresql-setup command
14        ansible.builtin.command: postgresql-setup initdb
15      - name: Start the service
16        ansible.builtin.service:
17          name: postgresql
18          state: started
19          enabled: true
20
21      - name: Allow the traffic through firewall
22        ansible.posix.firewalld:
23          port: 5432/tcp
24          permanent: true
25          state: enabled
```

30%

Reduction in development effort by leveraging Watson code assistant

95%

Reduction in manual effort for Infrastructure Setup and Environment Management activities

Thank you



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@devbard



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<https://www.ibm.com/consulting/microsoft>
<https://www.ibm.com/consulting/sap>




Holger.Bruchelt@Microsoft.com



@hobru



<https://www.linkedin.com/in/holger-bruchelt/>
 <https://youtube.com/SAPonAzure>