Power of Future of Your Business with Generative AI

Anil Babu Ankisettipalli, GenAI Foundations, SAP Labs LLC

Las Vegas

2024

SAPinsider

Generative AI consumption and tuning patterns over time

Prompt existing models

Prompt engineering of existing large language models (LLMs)

Original input image

OCR

Text with preserved 2D structure

```
                                                                    Donnau  SchweiB Technik GmbH
Lieferschein

                                                                    Guldenstr. 1 1
                                                                    75671 eggenstein
During Schwe'fttechnik GmbH Postfach 1108 86329 Konigsbrunn         Deutschland
                                                                    Telefonnr.
BBB  AG                                                             Fax.nr.
Abladestelle 41892 Hr. Kirzinger MT-144                             E-Mail:
Albert-Einstein-Str. 5
76930 Eggenstein
Deutschland                                                         Seite 1


Ihre Kunden-Nr.:        30951                       Lieferdatum:        7. Marz 2023
Lieferanten-Nr.:        770570-30                   Lieferungsnr.:       70500
Auftragsnummer:         5030066                    Ihre Umst-ID:
Auftragsdatum:          10.02.2023
Externe Belegnr.:       G5BPLGK
Pos.     Nr.              Beschreibung                                  Menge   Einheit
2        FD030305                                                          4 Stuck
                          PASSSCHRAUBE
                          2500  1078 001  007
                          Zeichnungsnummer:            8005
                          Ref-Nr.                      SAP-NR.  7303500
                          Einzelgewicht (netto) in kg:  0,01
                          Gesamtgewicht  (netto) in kg:  0,04
3        FD030600                                                          1 Stuck
                          GEWINDEBOLZEN
                          2500 041  011007
                          Zeichnungsnummer:            8003
                          Ref-Nr.                      SAP-NR. 7303506

Lieferbedingung.    FREI  HAUS            Frei Haus
Rech, an Adresse
Rech, an Deb.-Nr. 300078
BBB AG
Kreditorenbuchhaltung, Rechnungsprufung
Heidemannstrafie 170
80788 Munchen
Deutschland

                                                                    TUV
                                                                     SUD
```

LLM

Extract as JSON:
- DeliveryNoteNo: ID for the delivery note
- DocumentDate: Date of the document
- PurchaseDoc: Reference to purchase doc
- SuppierID: Supplier's unique ID
- Items: List of products
  - ItemNo: Number for the item in the list.
  - ProductID: ID for the product
  - Quantity: Amount of product
  - UnitOfMeasure: Measurement for quantity.

Structured result

```
{
   "DeliveryNoteNo": "70500",
   "DocumentDate": "2023-03-07",
   "PurchaseDoc": "G5BPLGK",
   "SupplierID": "770570-30",
   ”Items": [
      {
         "ItemNo": "2",
         "ProductId": "7303500",
         "Quantity": "4",
         "UnitOfMeasure": "Stück"
      },
      {
         "ItemNo": "3",
         "ProductId": "7303506",
         "Quantity": "1",
         "UnitOfMeasure": "Stück"
      }]
}
```

Retrieval-augmented generation

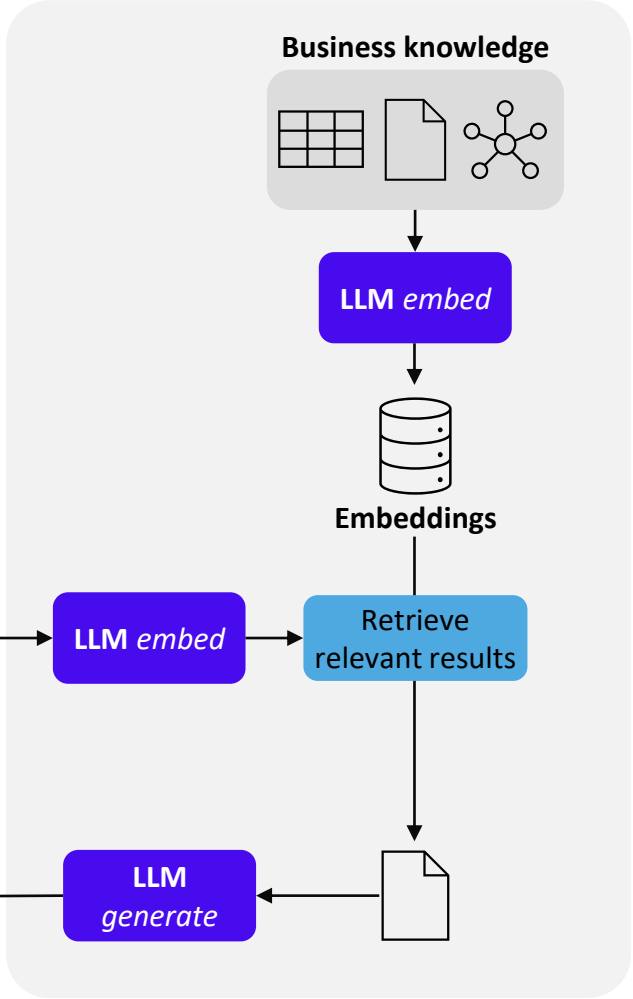
Integrate external knowledge

Answering business-specific questions requires two steps:

- Retrieve relevant business knowledge items given a question, using LLMs and other foundation models to *embed*.
- Use LLMs to *generate* the answer from the best results.

"How can I adapt my business process for VAT calculation?"

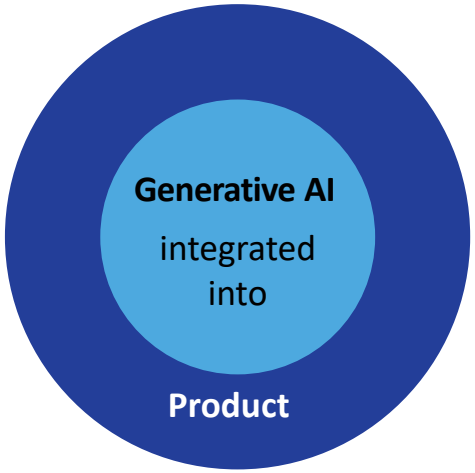
"Add a step to call *external service ES* to your *tax calculation process.*"



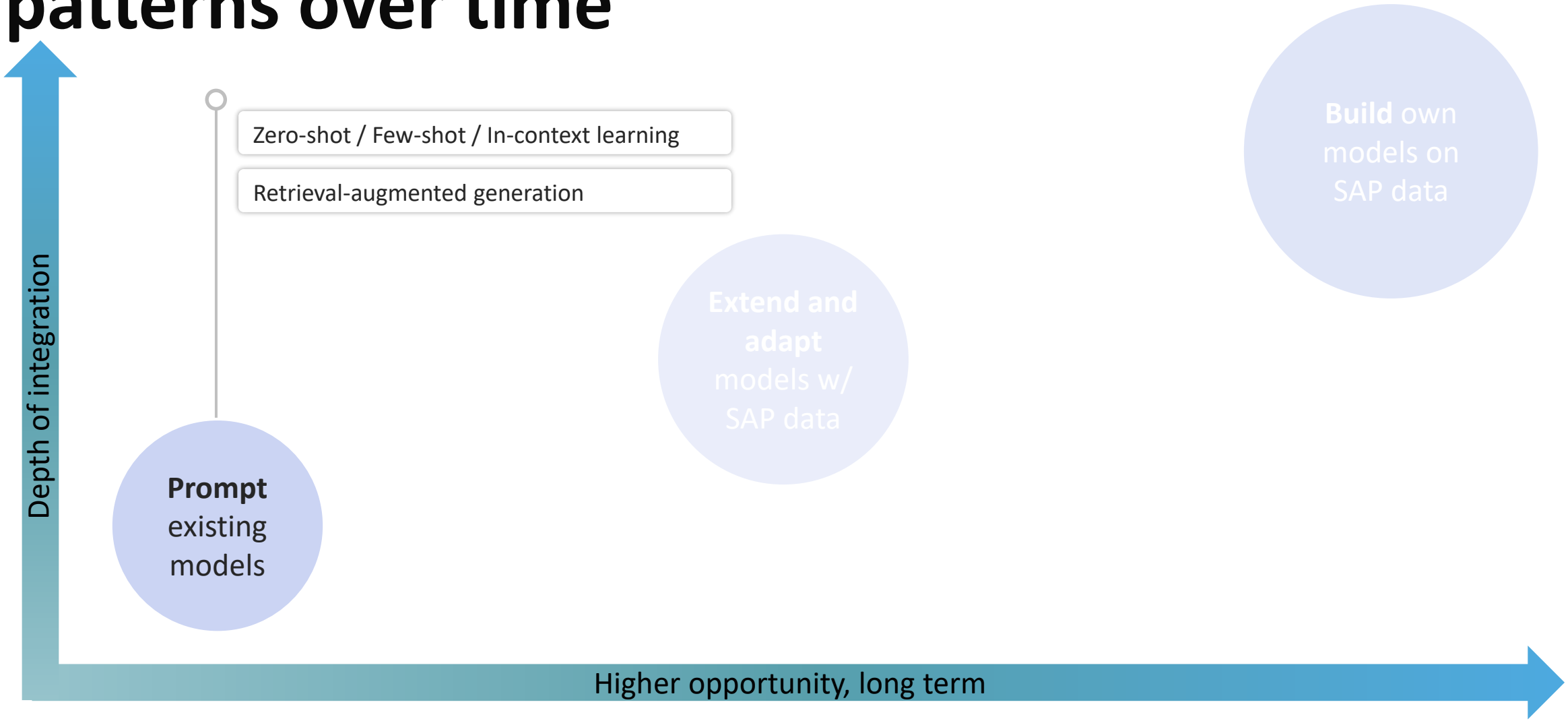
Generative AI + product interaction

Generative AI
in the product

Models can be used to provide intelligent functions in a product.



Generative AI consumption and tuning patterns over time

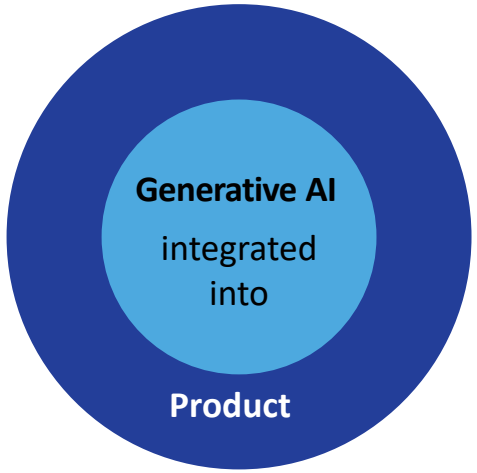


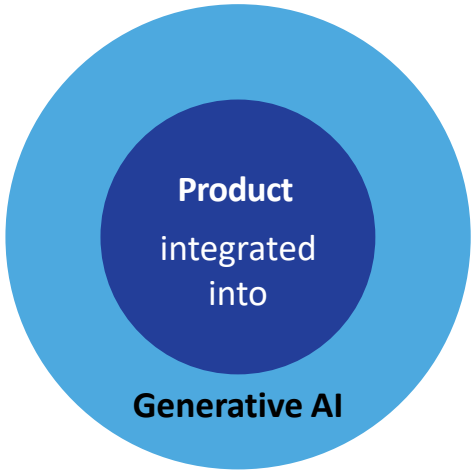
Extend models with SAP data

Generative AI + product interaction

Generative AI
in the product

Models can be used to provide intelligent functions in a product.





Generative AI utilizing
products as tools

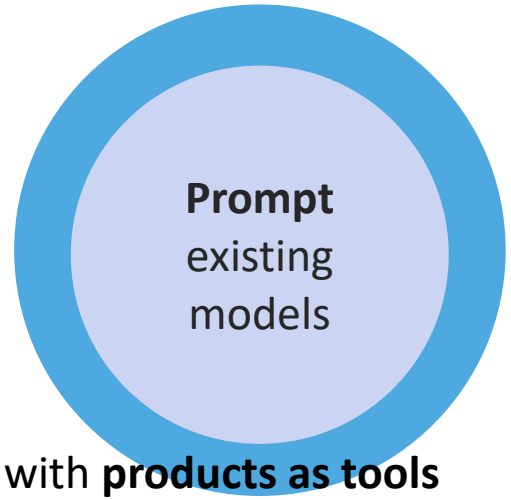
Models are given access to existing systems or products so that they can be instructed by the user to answer complex questions or solve tasks using the systems or products.

LLM-based AI agents

LLM-based AI agents

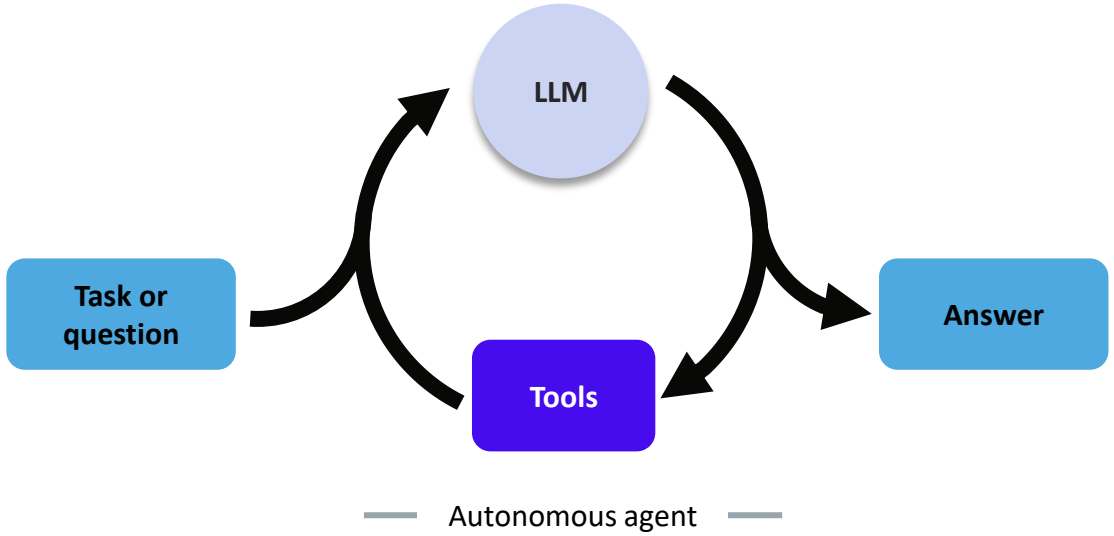
Experimental: Use prebuilt LLMs to build (semi)-autonomous systems

WHAT



with **products as tools**

HOW



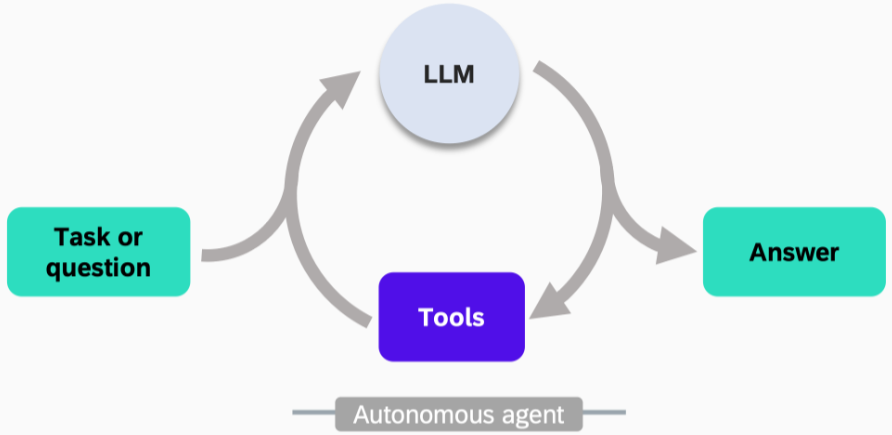
Demo

LLM-based AI agent

LLM-based AI agent: Demo

API Agents 🤖 - Extend LLMs with SAP Systems! 🚀

This is a technology demo to show case what is already possible with out-of-the-box LLMs.



Existing LLMs are **prompted** with knowledge from our API documentations (api.sap.com) to **extend** them with access to our systems.

Task/Question: User Inputs a Task

1. Retrieve
SAP Systems and their API specifications are retrieved based on the input (powered by **knowledge graphs**)

Type your message here...

Built with Chainlit

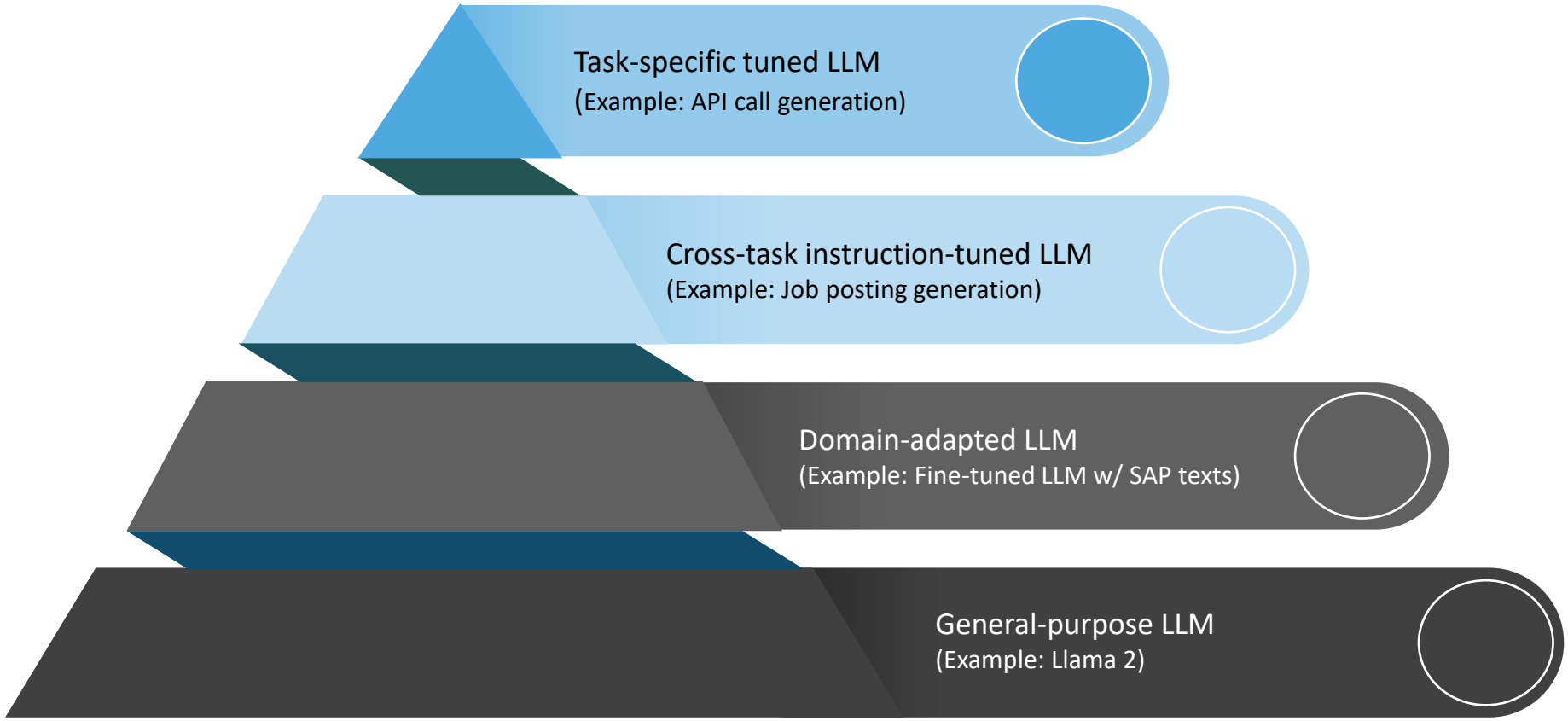
Demo

LLM-based AI agent

Adapt models with SAP data

Business adaptation

From general purpose to task-specific LLMs



Generative AI consumption and tuning patterns over time

Build own models on SAP data

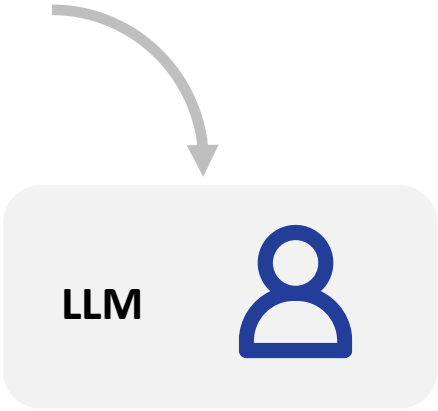
LLMs may not be sufficient for structured ML tasks

LLM input

Prompt for structured ML task*

LLM output

>> To predict the PAYMENTDELAY for the new customer, we would need to use a machine learning model trained on the provided example data. **However, as an AI text-based model, I don't have the capability to train and apply such a model**. <<



* Detailed prompt: Given is the following example table in JSON format with ground truth PAYMENTDELAY column: {json_string}. Given is also the following table in JSON format for unseen test customers without PAYMENTDELAY column: {json_string_test} Please predict the values of PAYMENTDELAY for those new customers by only outputting either "(1) payment in time", "(2) payment a bit late", "(3) payment late" or "(4) payment severely too late" for each of the table rows.'

Future | Foundation model

SAP's own foundation model to redefine enterprise AI

"Will SALES_ORDER_ITEM_42 be delivered to our Seattle manufacturing plant on time?"

SAP foundation model

SAP-specific development with an inherent understanding of business processes and SAP data

Customer data

Entailing crucial information for an accurate forecast

Large language model

Text understanding, text generation, and generic business knowledge

Knowledge graph

Human or machine-accessible representation of SAP data model

"No, SALES_ORDER_ITEM_42 will likely be delayed by 72 hours. Be aware that it is a critical component of PRODUCT_11 due to be shipped in 48 hours – we advise you to adjust your plans accordingly. "

Future | Foundation model

SAP's own foundation model to redefine enterprise AI

WHAT

SAP-specific foundation model with inherent understanding of business processes and SAP data across customers and use cases

SAP foundation model

WHY

- Enable **truly scalable enterprise AI** across customers and use cases
- Remove **time-consuming customer-specific training needs** (key hurdle in adoption of AI)
- Raise quality of predictions based on **SAP's unique set of enterprise data** and business process understanding

Differentiators

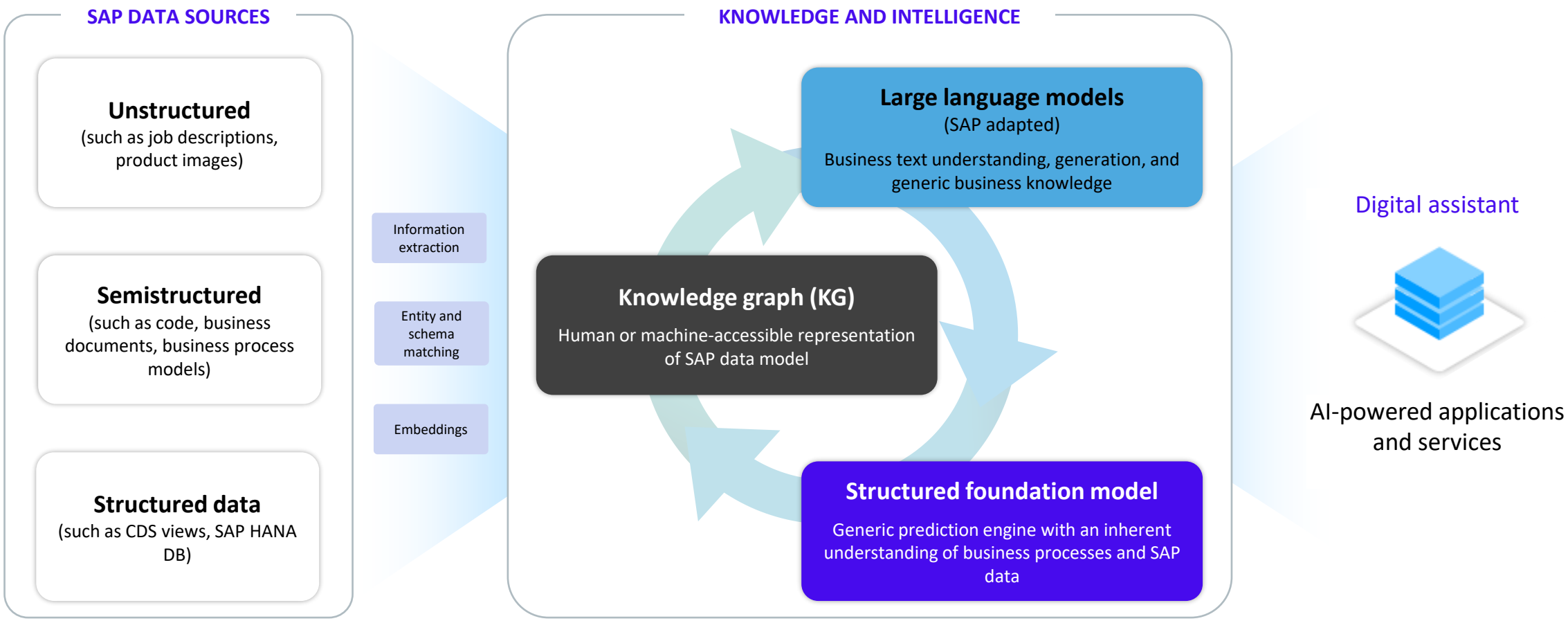
Enterprise data

Business process context

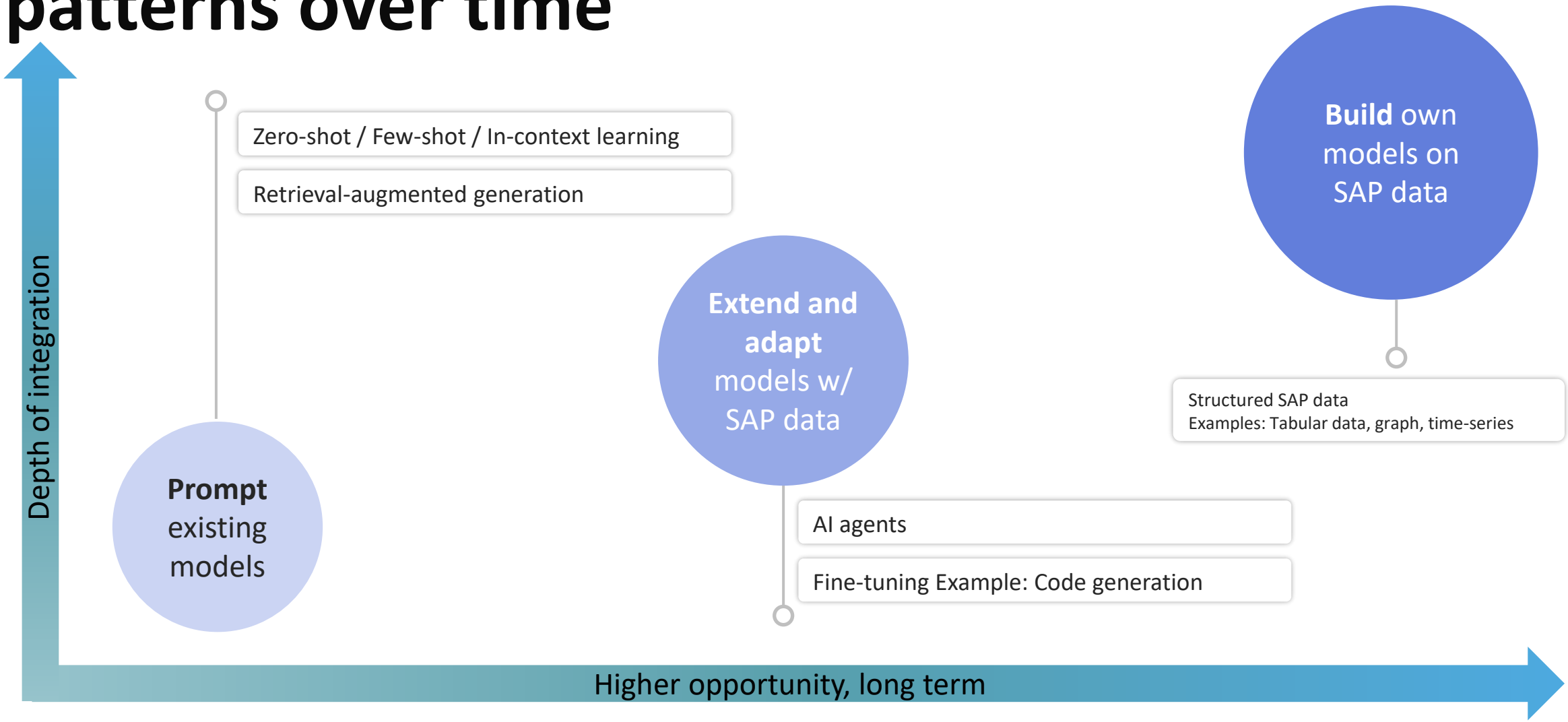
Domain and industry know-how

Future | Foundation model

From cross-customer data to LLMs, KGs, and foundation models



Generative AI consumption and tuning patterns over time



SAPinsider

SAPinsider.org

PO Box 982Hampstead, NH 03841

SAPinsider comprises the largest and fastest growing SAP membership group with more than 800,000 members worldwide.