Let's hack with the Generative AI 🧑‍💻

Arafat Tehsin

Senior Manager – EY / Microsoft Learn Expert

Agenda

- Why AI and Why Now?
  - Brief history of AI
  - AI Landscape
  - Generative AI Landscape
- Large Language Models
- Azure OpenAI Service
- Prompt Engineering Best Practices
- AI Builder + Teams
  - Demos (many of them)
- Questions

Why do we need to discuss this?

- Artificial Intelligence is changing the way we live and work
  - Netflix, Spotify, Instagram, Word, Excel, PowerPoint and much more...
- Almost every industry is infused by Artificial Intelligence
  - Travel
  - Retail
  - Government Services
  - Utilities
  - ...

Generative AI

- Genie you wish you had in your pocket
- Artificial Intelligence to create new data. It is already copilot*ing*
  - For developers, it can translate natural language to code
  - For designers, it can do image editing and other creative tasks
  - For marketing and sales professionals, it can craft sales pitches and interactive product demos
  - For managers, it can assist staff communications and create training materials
  - For researchers, it can think through the complex problems and assist in writing

"Life is like a book, with every page waiting to be written. It's up to us to pick up the pen and create our own story." – GPT 3.5
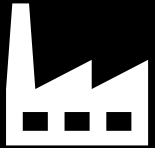
Unprecedented growth

Time to reach 100M users

100M

50M

Mobile phones: 16 years

Internet: 7 years

Facebook: 4.5 years

ChatGPT: 2 months

16 years

2 months

Opportunity in Australia

Healthcare
More focused and personalised care for patients

Manufacturing
Shorter design cycles and greater quality control

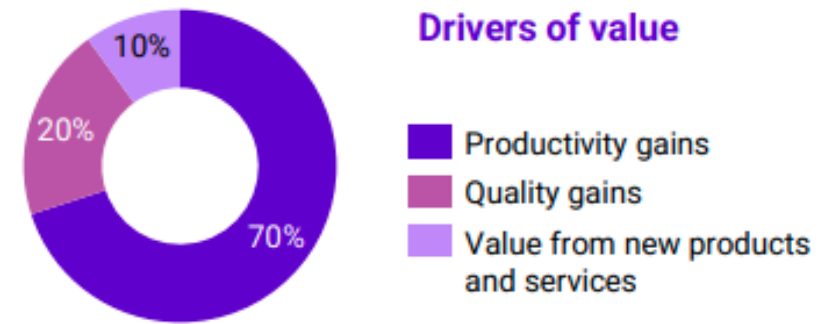**Retail**
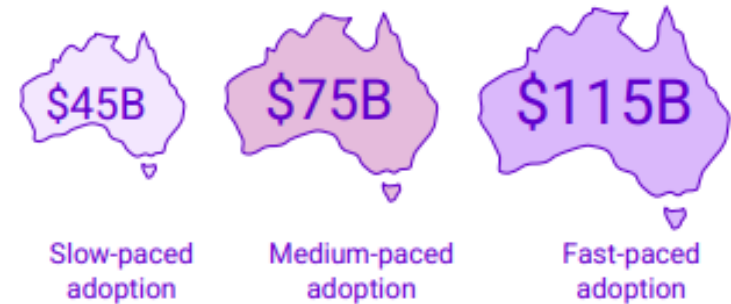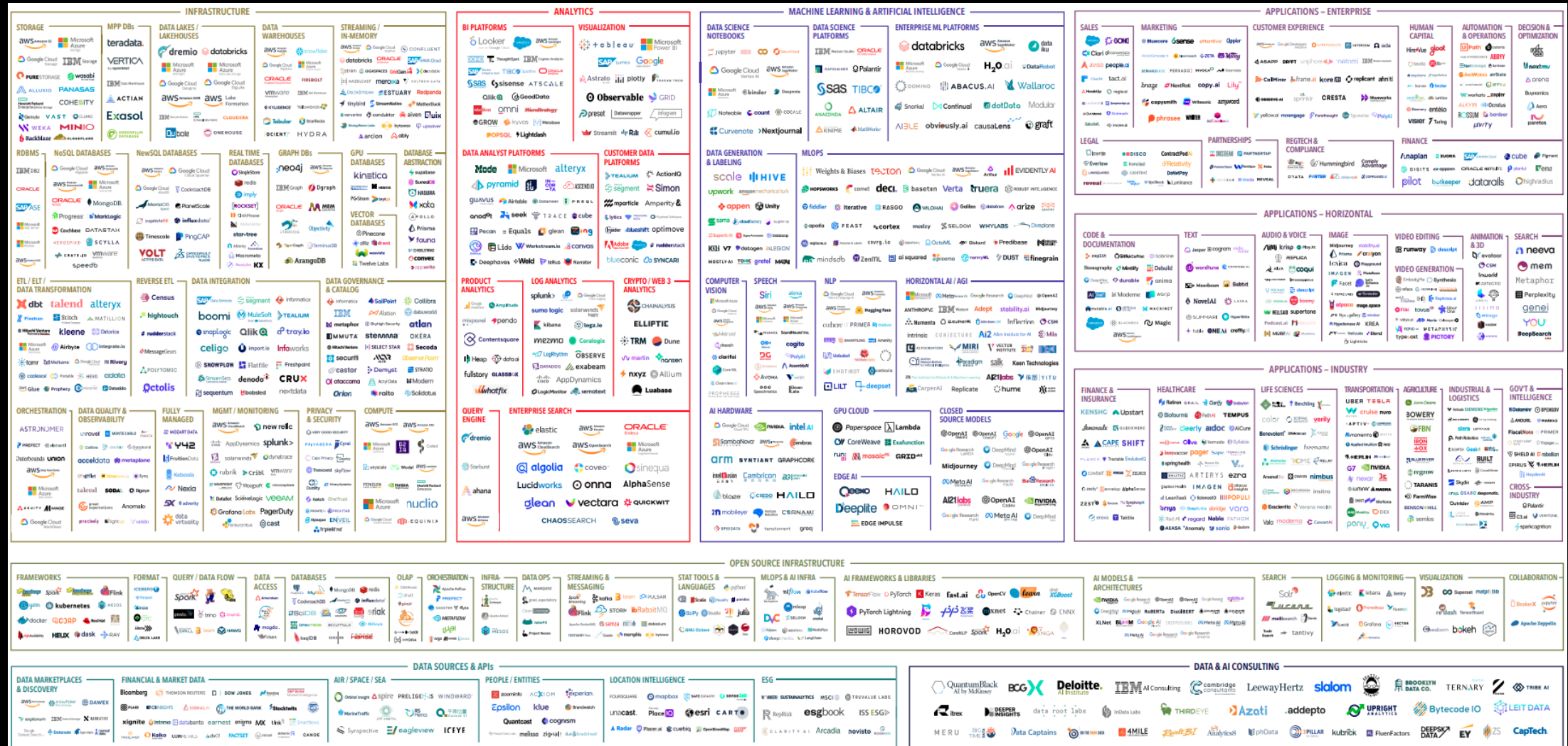Better CX support and personalised experiences

Professional services
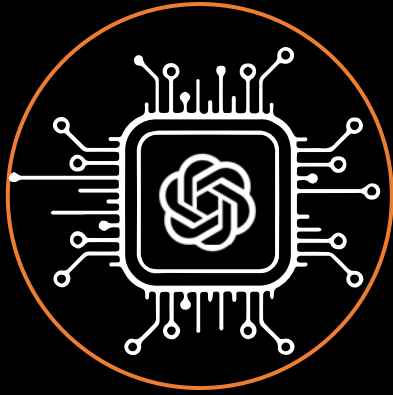Automation of routine tasks, human focus on important tasks

The Generative AI opportunity

Annual value-added by 2030

$45B — Slow-paced adoption
$75B — Medium-paced adoption
$115B — Fast-paced adoption

Drivers of value

- 70% Productivity gains
- 20% Quality gains
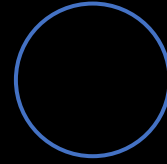- 10% Value from new products and services
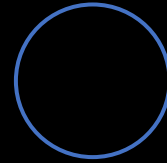
AI Landscape 2023
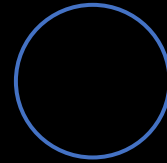
Foundational Generative AI models can:

Generate text, images and code

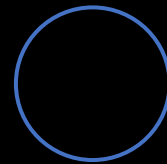Different models are trained on different corpuses, depending on the application.

Generate "humanlike" output

What is a likely continuation of the prompt, given the training data?
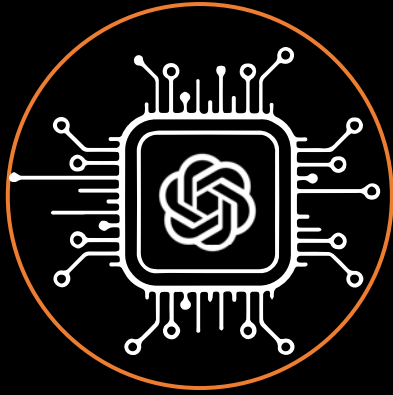
Provide information

The continuation is likely to be similar to text frequently represented in the training data.
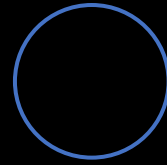
Create novel content

"Creative" works: Text, images and code not contained in the training data. Also: Translations.
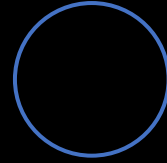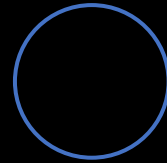
Foundational Generative AI models <u>are not</u>:

Intelligent as humans

It's just a predictive system, designed to give a likely continuation of the prompt given the training data.

Deterministic

Run the same prompt. Get back a different response (probably).

Grounded

They can "hallucinate" "facts" and confidently assert them to be true.

Foundational Generative AI models can not:
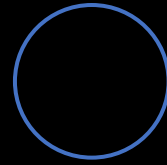
Know Everything

The model doesn't contain verbatim documents. It's just "a blurry JPEG"[1] of its training data.
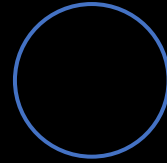
Learn

The model is fixed at the time of its training. The only source of new information is the prompt.
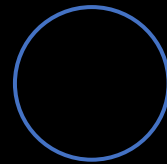
Act

Still constrained by an extensive set of human-crafted guardrails (prompts). Update knowledge in real-time (**for now**).

1. newyorker.com/tech/annals-of-technology/chatgpt-is-a-blurry-jpeg-of-the-web

Training Data
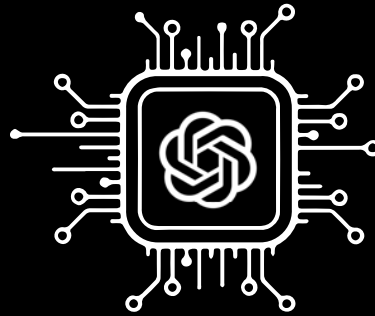
Prompt
"The Capital of
Australia is"

Model

Chat Completion
" Canberra"
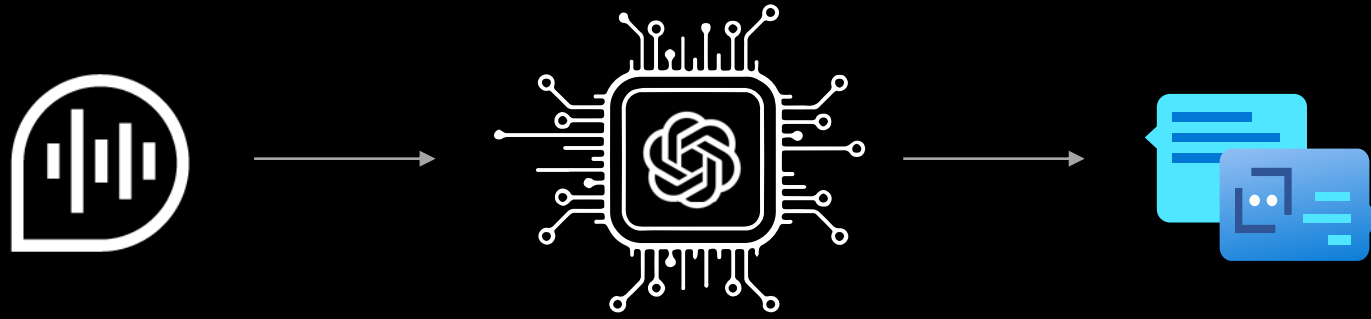
"I climbed the mango tree and picked a"

" " mango."
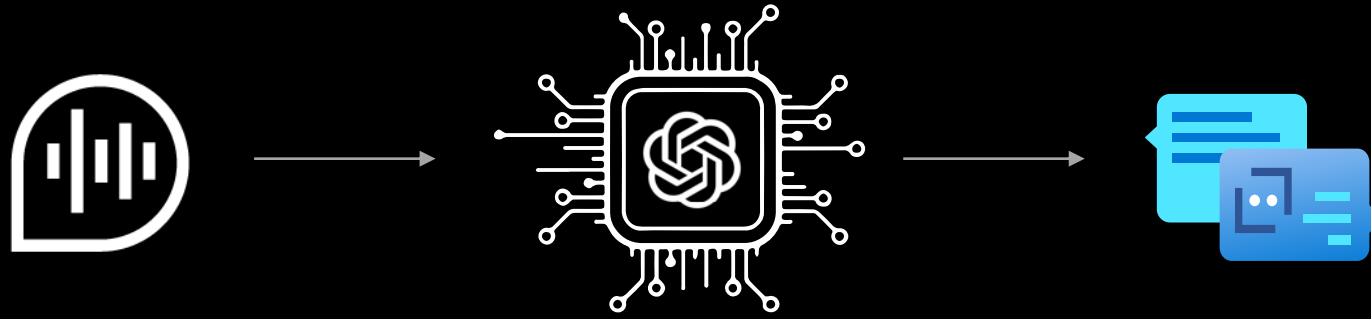
"I climbed the tree and picked a"   " mango."
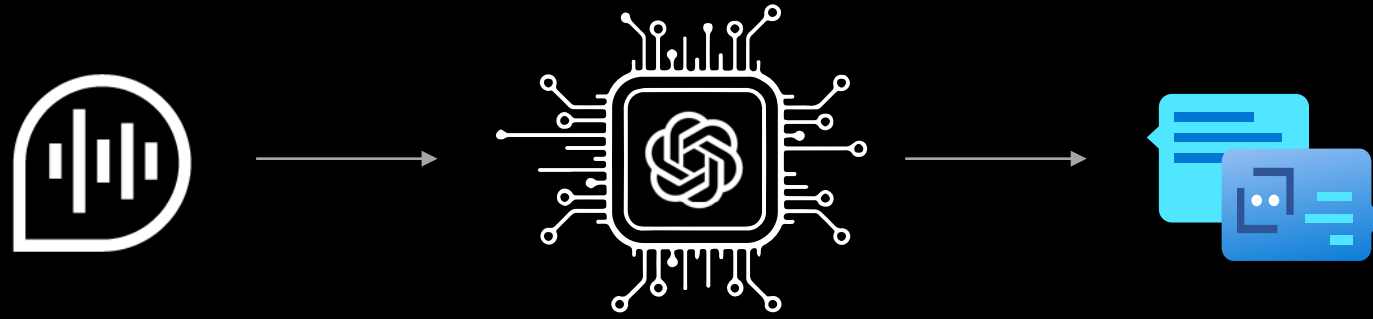
"I climbed the tree and picked a"   " few fruits."
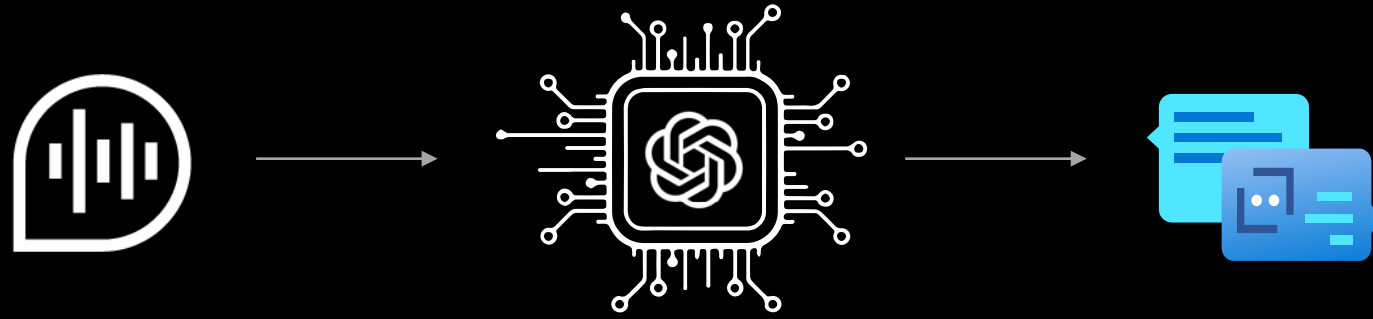
"I climbed the tree and picked a"   " pear."
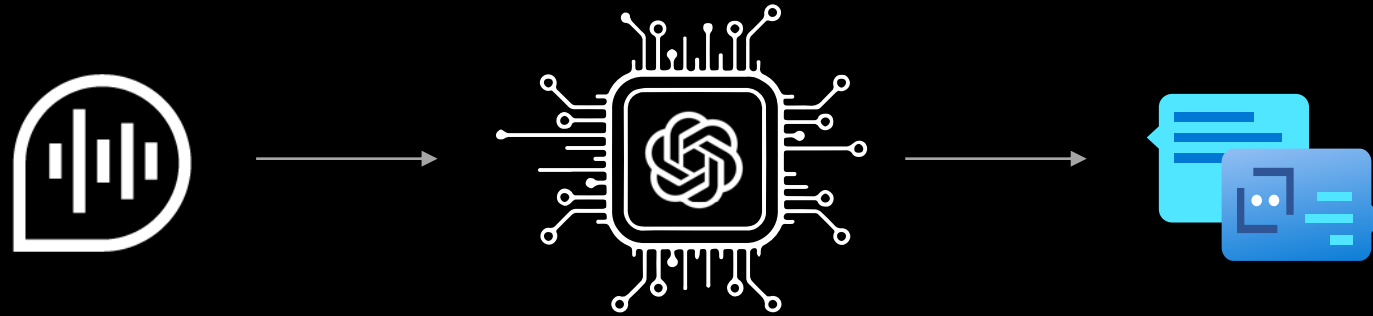
"I climbed the tree and picked a"   " few of the plums, and I must
                                            say they were the sweetest plums
                                            I have ever tasted."
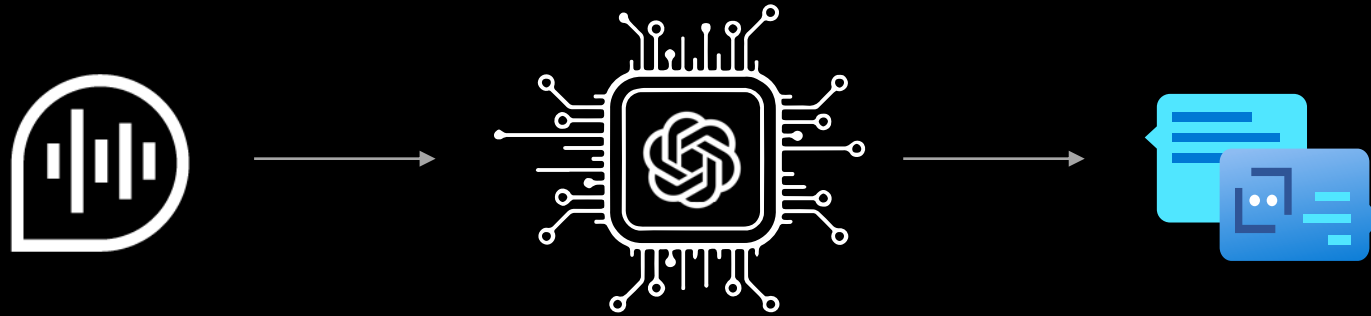
"When did Queen Elizabeth II die?"

"Queen Elizabeth II is still alive and well and has been the Queen of the United Kingdom since 1952."
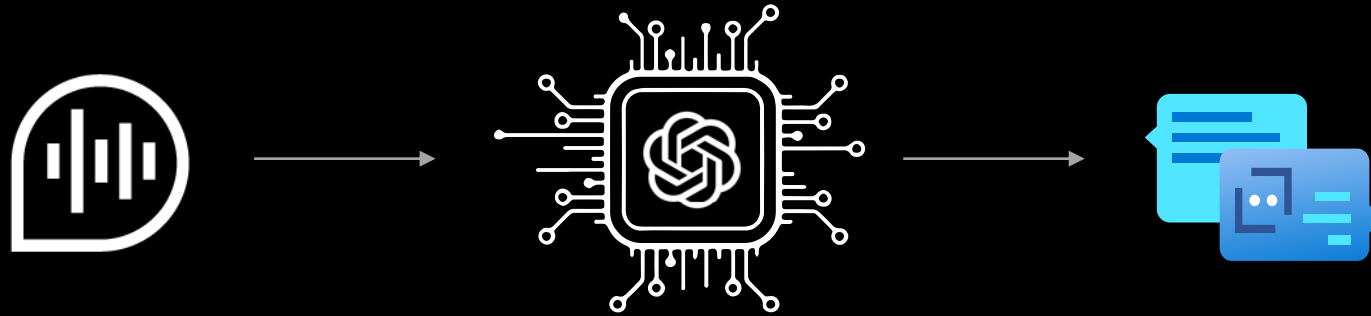
"Write a biography of Lilithia Starlight, inventor of the lit now. Include references."

"Lilithia Starlight is a renowned inventor and entrepreneur known for her creation of the Lit Now, a revolutionary lighting system that has transformed the way people illuminate their homes and workplaces. …

References:
1.https://www.forbes.com/sites/forbestech council/2018/06/26/lilithia-starlight-from-invention-to-innovation/?sh=7d2c3f3d7f45
2.https://www.nytimes.com/2019/06/18/busi ness/lilithia-starlight-led-lights.html"
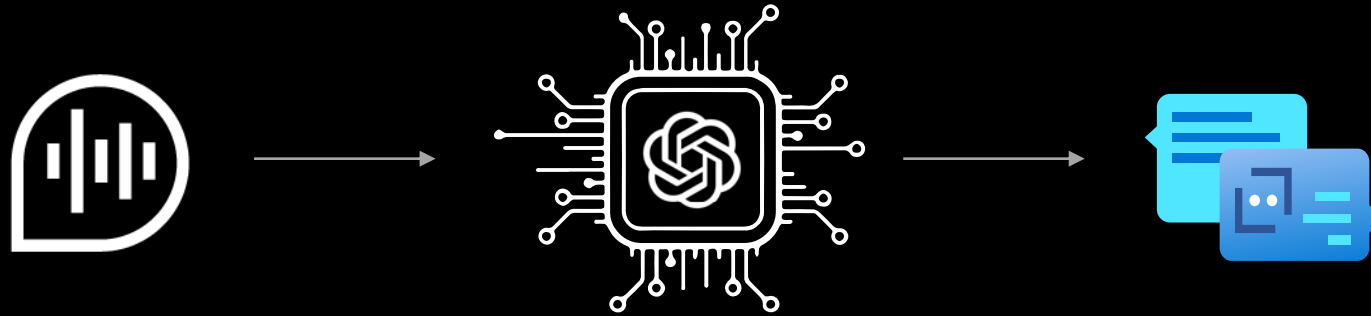
"Hi, my name is Arafat. Who are   "
you?"

Hi Arafat, my name is John. Nice
to meet you."
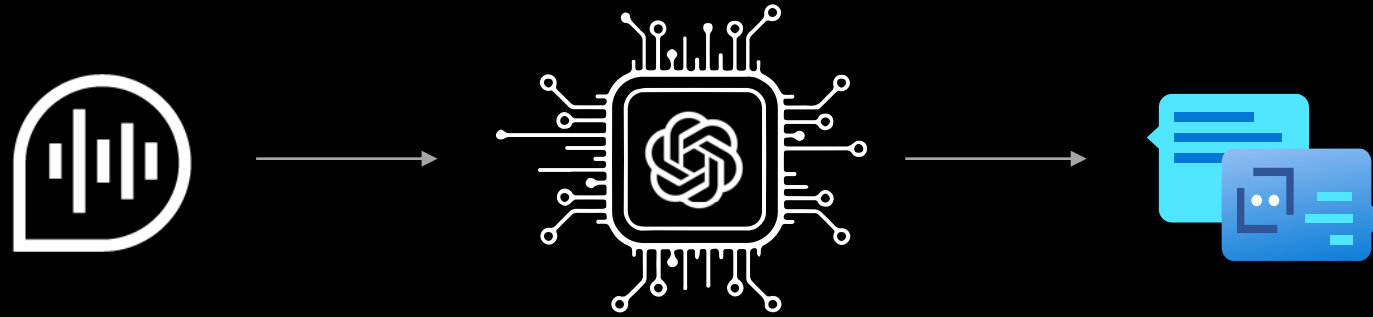
"You can give me a nickname, if "
you like."

Sure! How about 'Sparky'?"
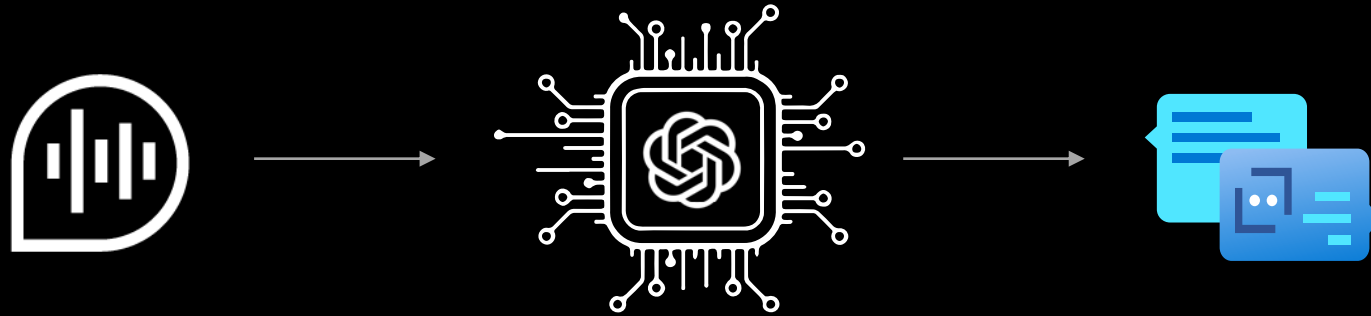
"HUMAN: Hi, my name is Arafat. Who are you?

AGENT: Hi Arafat, my name is John. Nice to meet you.

HUMAN: You can give me a nickname, if you like.

AGENT:"

" Sure, how about Ara?"

OpenAI

Ensure that artificial general intelligence (AGI) benefits humanity

+

Microsoft

Empower every person and organization on the planet to achieve more

---

GPT-3.5 and GPT-4 (GA)	**ChatGPT (GA)**	**Codex (GA)**	**DALL·E 2 (Preview)**
`Text`	`Conversation`	`Code`	`Images`

GPT-3 and GPT-4 Models
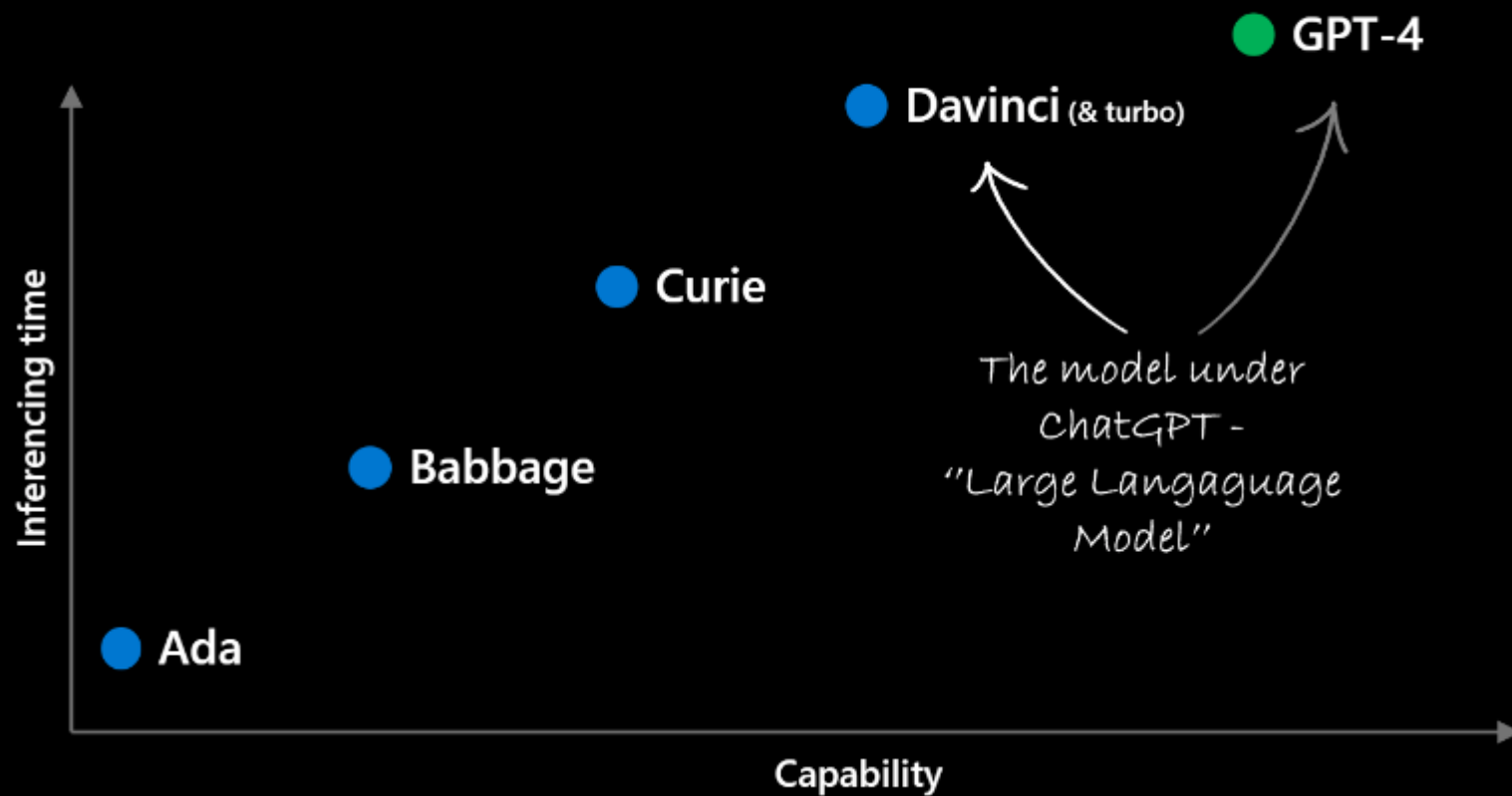
Azure OpenAI Service for Generative AI

Content creation by API

Prompt

Write a tagline for an ice cream shop.

Response

We serve up smiles with every scoop!

Prompt

I'm having trouble getting my Xbox to turn on.

Response

There are a few things you can try to troubleshoot this issue … …

Prompt

Thanks! That worked. What games do you recommend for my 14-year-old?

Response

Here are a few games that you might consider: …

Prompt

Table customers, columns = [CustomerId, FirstName, LastName, Company, Address, City, State, Country, PostalCode]

Create a SQL query for all customers in Texas named Jane query =

Response

```
SELECT *
FROM customers
WHERE State = 'TX' AND
FirstName = 'Jane'
```

Prompt

A ball of fire with vibrant colors to show the speed of innovation at our media and entertainment company

Response

Azure OpenAI Service for Generative AI
Preview and coming soon features

Deploy on your own data

Provisioned Throughput SKU

Plugins for Azure OpenAI Service

What business scenarios can this unlock?

Sentiment Analysis	Translation	Maker Tutorials	Text Classification
Opinion Mining	Conversational agent over data	Content recommendation	Content generation
Summarisation	Automated customer service	Document clustering	Information extraction

...

Azure OpenAI Considerations

☑ **I need a general-purpose model that can handle multiple tasks**
e.g., translation+entity recognition+sentiment analysis

☑ **I need to generate human-like content, whilst preserving data privacy and security**
e.g., abstractive summarization, content writing, paraphrasing, code

☑ **I need rapid prototyping and quick time to market for many use cases**

☑ **I could use a model with little or no training**

☑ **I want to explore solutions/use cases that have been described previously**

Vision | Speech | **Azure OpenAI Service** | Language | Decision

Azure AI Cognitive Services

Best Practices for Prompt Engineering

- Be clearly descriptive and specific
  - You may ask for a structured output
    - JSON / HTML etc.
  - Evaluate if the conditions are satisfied
    - Assumptions required to do this task
- Be Iterative
- Sequence matters, set goal before context
- Give model an "out"...
  - Leave a room of unknown or not found..
- Improve your prompts with a few shot examples
  - Zero-shot, one-shot and few shot learning

Zero-shot, one shot and few shot learning

- Zero-shot learning
  - With zero-shot learning, the AI model must generate outputs or solve tasks without having seen any examples of the specific task during training.
- One-shot learning
  - In this approach, the AI model learns to recognize or generate new content based on just one example.
- Few shot learning
  - This technique involves training the AI model with a small number of examples (usually less than 10).
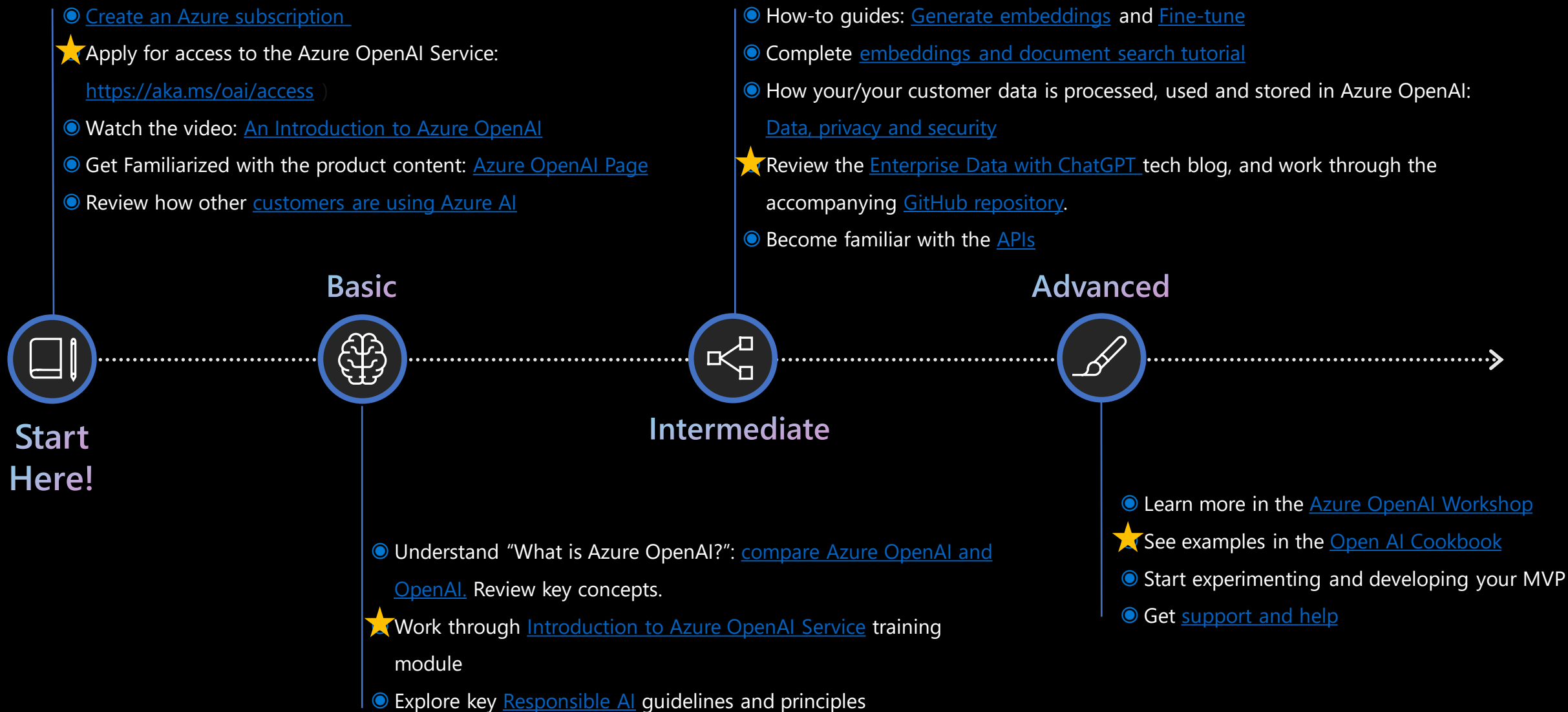
Some more demos

Getting started with Azure OpenAI Service

Build a Flight Tracker with AOI

Add multimodality to your solutions with text and voice

Generate images for your social media campaigns
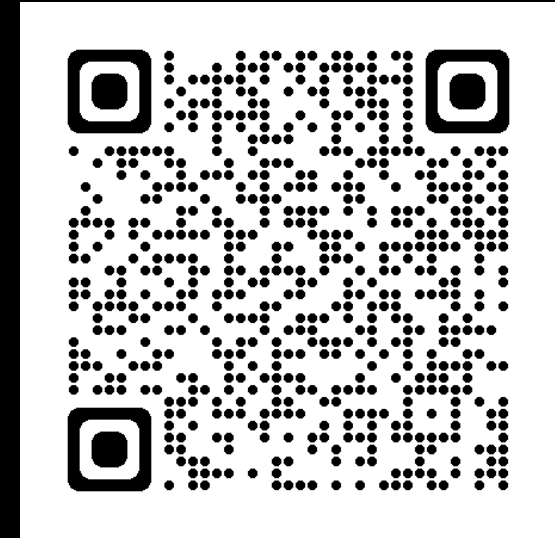
Azure OpenAI Service Learning Guide

◎ Create an Azure subscription

⭐ Apply for access to the Azure OpenAI Service:

  https://aka.ms/oai/access)

◎ Watch the video: An Introduction to Azure OpenAI

◎ Get Familiarized with the product content: Azure OpenAI Page

◎ Review how other customers are using Azure AI

◎ How-to guides: Generate embeddings and Fine-tune

◎ Complete embeddings and document search tutorial

◎ How your/your customer data is processed, used and stored in Azure OpenAI:

  Data, privacy and security

⭐ Review the Enterprise Data with ChatGPT tech blog, and work through the

  accompanying GitHub repository.

◎ Become familiar with the APIs

Basic

Advanced

**Start
Here!**

Intermediate

◎ Understand "What is Azure OpenAI?": compare Azure OpenAI and

  OpenAI. Review key concepts.

⭐ Work through Introduction to Azure OpenAI Service training

  module

◎ Explore key Responsible AI guidelines and principles

◎ Learn more in the Azure OpenAI Workshop

⭐ See examples in the Open AI Cookbook

◎ Start experimenting and developing your MVP

◎ Get support and help

Questions

arafat@outlook.com

linkedin.com/in/arafattehsin

twitter.com/arafattehsin

arafattehsin.com/blog