Data Literacy: Essentials of Microsoft Azure Cognitive Services

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What is AI

AI does one or more human capabilities

AI can do:

- Visual perception and recognition
    - View photos and check faces
- Text analysis
    - Check the entities and the subject
- Speech
    - Talking with a chatbot or ChatGPT with NLP
- Decision making
    - With experience and data take the best option like when to choose one approach or another approach

Azure cognitive services encapsulate AI capabilities in a set of individual services that helps you build powerful apps

For text :
- Text analytics
    - Detect sentiments and key phrases
- Translator
    - It can translate languages
- Immersive Reader
    - Helps readers of all levels to understand a text with the help of audio and video
- Language Understanding
    - Helps brings natural language understanding for chatbots so they can understand the language
- QnA Maker
    - Helps make conversation question and answer chatbots

For Speech:
- Speech Service
    - Speech to text
        - Voice to text
    - Text to speech
        - Text to voice
    - Speech translation
        - Real time translation speaking
    - Speech recognition

- Identify and verify the people speaking based on audio

For Video
- Computer Vision
    - Analyze content in images and video
- Video indexer
    - Analyze the visual and audio channels of a video and index its content
- Custom Vision
    - Customize image recognition to fit your business needs
- Face
    - To detect and identify people and emotions in images

- Form recognizer
    - To extract text, key value pairs, and tables from documents.

For Decisions
- Anomaly Detector
    - To Identify potential problems early on
- Content moderator to detect potentially offensive or unwanted content
- Metrics advisor
    - To monitor metrics and diagnose issues
- Personalizer
    - To create rich personalized experiences for every user

For bots
- Azure Bot Service
    - By speaking with the user it can redirect with an appropriate operator

Azure Cognitive Search
- It is a cloud search service that gives developers APIs and tools for building rich search experiences

Planning with cognitive services

1 Create resource in
your Azure subscription

Resources can be:

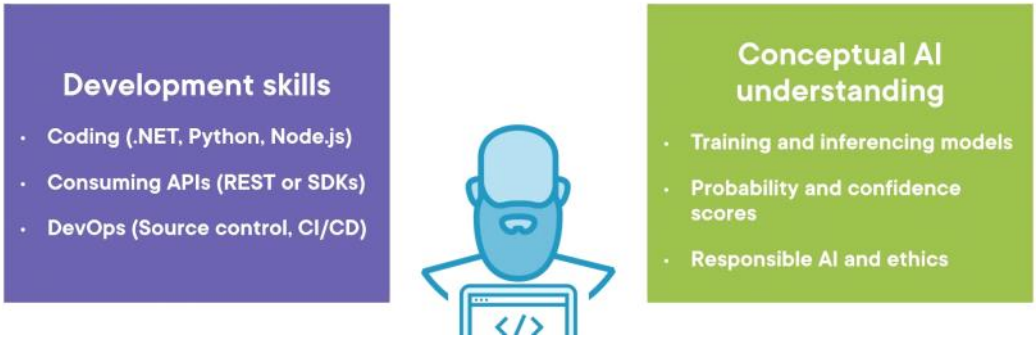
Single-service
resource (You create each resource)

Multi-service
resource (Use many resources)

To use a service you need:
Endpoints, keys to authenticate and the location where the location is hosted

Principles of responsible AI

Responsible AI Education for Software Engineers



- Fairness

- Reliability and safety

- Privacy and security

- Inclusiveness

- Transparency

- Accountability

Implementing Cognitive Services Containers

Container images available for most commonly used cognitive services allows you to host Azure Cognitive Services either on cloud or local

That means:

- If you have an on-premises database and you can deploy your AZ cognitive services in the same network and it stay there and not go to the cloud
- Decrease the latency

You can deploy any cognitive services container in any container host for example:

- Custom docker hosts
- Azure Container instances
- Azure Kubernetes Services
- Azure Kubernetes Cluster

There are docker containers ready to use with cognitive services in microsoft site

And not all functionalities are inside a unique container

The container still needs to be able to connect to the Azure resource manager endpoint in order to submit usage metrics for billing

Configuring Security for a Cognitive Services Solution

- In order to use Az cognitive services you need to provide a key

- It is recommended to use a service principal identity to access it (Like Azure Key Vault)

Regenerate (Recreate keys) and rotate regularly your keys

Consider storing your keys in Azure Key Vault
- When creating a cognitive service it is provided two keys (Key 1, Key 2) use key 2 then regenerate key 1, use key 1 and regenerate key 2

- Associate a secret in azure keyvault with the key1

Secure Cognitive Services by Using Azure VNET

VNets are supported in regions where Cognitive Services are available