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# Microsoft Azure AI Fundamentals (AI-900) Crash Course





# Reza Salehi

Cloud Consultant and Trainer





# Microsoft Azure Fundamentals (AZ-900) Certification Course

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By [Reza Salehi](#)



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TIME TO COMPLETE:

4h 37m

LEVEL:

Beginner

TOPICS:

[Microsoft Azure](#)

PUBLISHED BY:

[O'Reilly Media, Inc.](#)

PUBLICATION DATE:

October 2022

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# Azure Cookbook

Recipes to Create and Maintain Cloud Solutions  
in Azure



Reza Salehi



# Course Overview





# AI-900 Crash Course

- Describe Artificial Intelligence workloads and considerations (15-20%)
- Describe fundamental principles of machine learning on Azure (20-25%)
- Describe features of computer vision workloads on Azure (15-20%)
- Describe features of Natural Language Processing (NLP) workloads on Azure (15-20%)
- Describe features of generative AI workloads on Azure (15-20%)



# Course Repository

<https://github.com/zaalion/oreilly-ai-900>



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Demo

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Updated slide deck



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EXAMS

## Exam AI-900: Microsoft Azure AI Fundamentals



This exam is an opportunity to demonstrate knowledge of machine learning (ML) and artificial intelligence (AI) concepts and related Microsoft Azure services. Candidates for this exam should have familiarity with Exam AI-900's self-paced or instructor-led learning material.

This exam is intended for candidates with both technical and non-technical backgrounds. Data science and software engineering experience are not required; however, awareness of cloud basics and client-server applications would be beneficial.

Azure AI Fundamentals can be used to prepare for other Azure role-based certifications like Azure Data Scientist Associate or Azure AI Engineer Associate, but it is not a prerequisite for any of them.

You may be eligible for ACE college credit if you pass this certification exam. See [ACE college credit for certification exams](#) for details.

## Important

The English language version of this exam will be updated on November 2, 2023. Review the study guide linked in the "Tip" box for details on upcoming changes. If a localized version of this exam is available, it will be updated approximately eight weeks after this date. While Microsoft makes every effort to update localized versions as noted, there may be times when the localized versions of this exam are not updated on this schedule.

Passing score: 700. [Learn more about exam scores.](#)

## Tip

- Review the [AI-900 study guide](#)  to help you prepare for the exam
- Demo the exam experience by visiting our [exam sandbox](#) 

## Note

Cognitive Services has been renamed to Azure AI Services. Individual services have also been renamed. These changes will appear on the exam in late 2023. [Learn more about Azure AI services.](#)

**Part of the requirements for:** Microsoft Certified: Azure AI Fundamentals

**Related exams:** none

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## Two ways to prepare

Self-paced

Instructor-led

### Items in this collection

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##### Microsoft Azure AI Fundamentals: Get started with artificial intelligence

2 Modules

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#### LEARNING PATH

##### Microsoft Azure AI Fundamentals: Explore visual tools for machine learning

4 Modules

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#### LEARNING PATH

# Describe Artificial Intelligence workloads and considerations (15-20%)





# Describe Artificial Intelligence workloads and considerations (15-20%)



- Identify features of common AI workloads
- Identify guiding principles for responsible AI



# Identify Features of Common AI Workloads

- Identify features of content moderation and personalization workloads
- Identify computer vision workloads [see 1 2 3 4 5 6 7]
- Identify natural language processing workloads [see 0 1 2 3 4 5]
- Identify knowledge mining workloads [see 1 2 3 4 5]
- Identify document intelligence workloads [see 1]
- Identify features of generative AI workloads



# Identify Guiding Principles for Responsible AI

- Describe considerations for fairness in an AI solution [see [1](#) [2](#) [3](#)]
- Describe considerations for reliability and safety in an AI solution [see [1](#)]
- Describe considerations for privacy and security in an AI solution [see [1](#)]
- Describe considerations for inclusiveness in an AI solution [see [1](#)]
- Describe considerations for transparency in an AI solution [see [1](#)]
- Describe considerations for accountability in an AI solution [see [1](#)]



# Describe Fundamental Principles of Machine Learning on Azure (20-25%)





# Describe Fundamental Principles of Machine Learning on Azure (20-25%)

- Identify common machine learning techniques
- Describe core machine learning concepts
- Describe Azure Machine Learning capabilities



# Identify Common Machine Learning Techniques

- Identify regression machine learning scenarios [see [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#)]
- Identify classification machine learning scenarios [see [1](#) [2](#)]
- Identify clustering machine learning scenarios [see [1](#) [2](#)]
- Identify features of deep learning techniques [see [1](#) [2](#)]



# Describe Core Machine Learning Concepts

- Identify features and labels in a dataset for machine learning [see [1](#)]
- Describe how training and validation datasets are used in machine learning [see [1](#) [2](#)]



# Describe Azure Machine Learning Capabilities

- Describe capabilities of Automated machine learning [see [1](#) [2](#) [3](#)]
- Describe data and compute services for data science and machine learning
- Describe model management and deployment capabilities in Azure Machine Learning [see [1](#) [2](#)]

# Creating Your Own ML Model

## **1. Define the problem**

**2. Collect and prepare data** (Ensure it's clean, well-organized, and relevant)

**3. Preprocess data** (Handle duplicates, missing values, outliers, etc.)

**4. Split the data** (training, validation/test)

**5. Choose a model** (select a ML algorithm/model based on the nature of your problem)

## **6. Set / tune hyperparameters**

(settings that affect the learning process & not learned from the data)

**7. Train the model** (Feed the training data into the model)

**8. Validate the model**

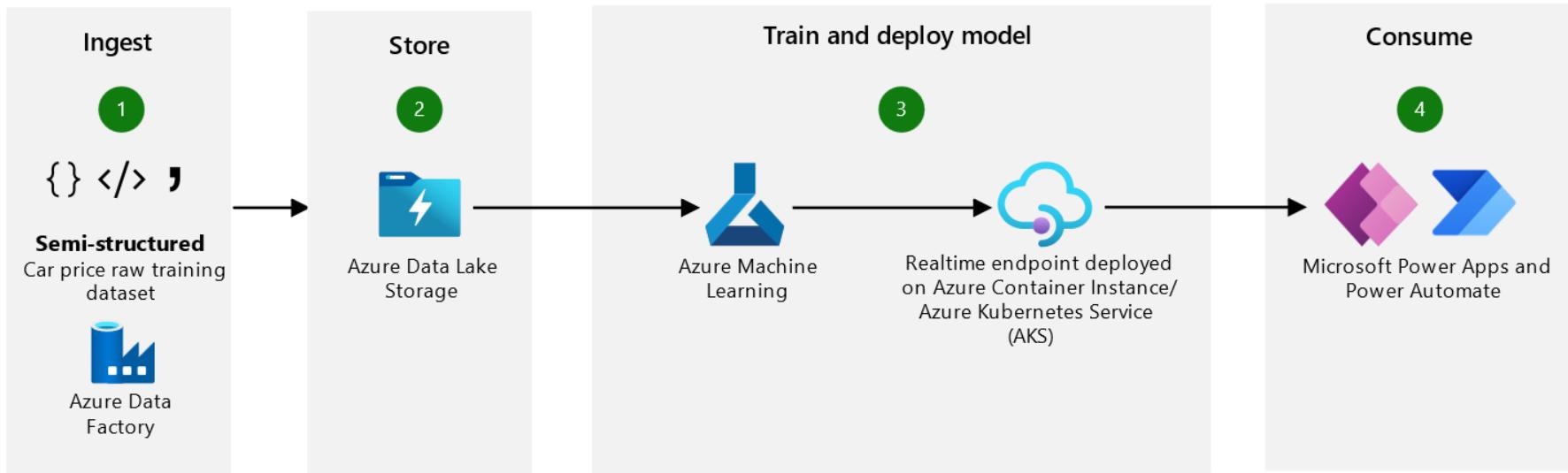
**9. Evaluate on test set** (go to 6)

**10. Deploy the model**

**11. Monitor and maintain**



# Creating Your Own ML Model





# Describe Features of Computer Vision Workloads on Azure (15– 20%)





# Describe Features of Computer Vision Workloads on Azure (15–20%)

- Identify common types of computer vision solutions
- Identify Azure tools and services for computer vision tasks



# Identify Common Types of Computer Vision Solutions

- Identify features of image classification solutions [see [1](#) [2](#)]
- Identify features of object detection solutions [see [1](#) [2](#)]
- Identify features of optical character recognition solutions [see [1](#) [2](#)]
- Identify features of facial detection and facial analysis solutions [see [1](#) [2](#) [3](#)]



# Identify Azure Tools and Services for Computer Vision Tasks

- Describe capabilities of the Azure AI Vision service [see [1](#) [2](#)]
- Describe capabilities of the Azure AI Face detection service [see [1](#) [2](#)]

# Describe Features of Natural Language Processing (NLP) Workloads on Azure (15-20%)





# Describe Features of Natural Language Processing (NLP) Workloads on Azure (15-20%)

- Identify features of common NLP workload scenarios
- Identify Azure tools and services for NLP workloads



# Identify Features of Common NLP Workload Scenarios

- Identify features and uses for key phrase extraction [see [1](#) [2](#)]
- Identify features and uses for entity recognition [see [1](#)]
- Identify features and uses for sentiment analysis [see [1](#)]
- Identify features and uses for language modeling [see [1](#) [2](#)]
- Identify features and uses for speech recognition and synthesis [see [1](#) [2](#)]
- Identify features and uses for translation [see [1](#) [2](#)]



# Identify Azure Tools and Services for NLP Workloads

- Describe capabilities of the Azure AI Language service [see [1](#)]
- Describe capabilities of the Azure AI Speech service [see [1](#)]



# Describe features of generative AI workloads on Azure (15–20%)





# Describe features of generative AI workloads on Azure (15–20%)

- Identify features of generative AI solutions
- Identify capabilities of Azure OpenAI Service



# Identify Features of Generative AI Solutions

- Identify features of generative AI models [see [1](#)]
- Identify common scenarios for generative AI [see [1](#) [2](#)]
- Identify responsible AI considerations for generative AI



# Identify Capabilities of Azure OpenAI Service

- Describe natural language generation capabilities of Azure OpenAI Service
- Describe code generation capabilities of Azure OpenAI Service [see 1]
- Describe image generation capabilities of Azure OpenAI Service

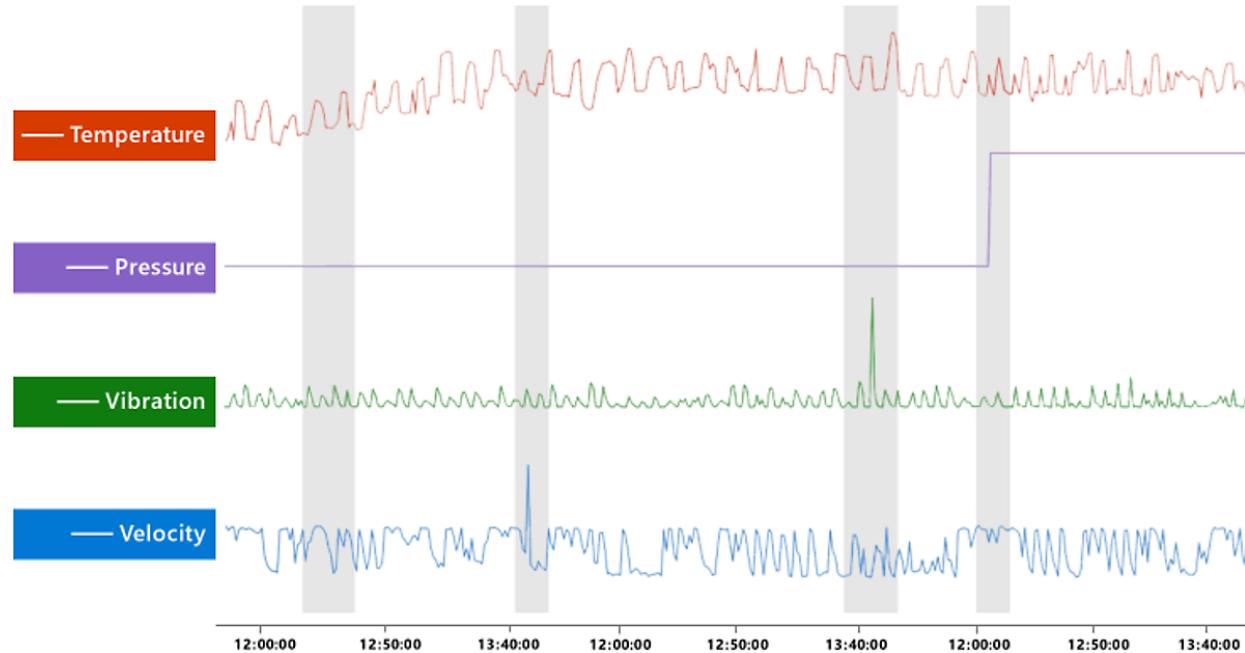


# AI Workloads



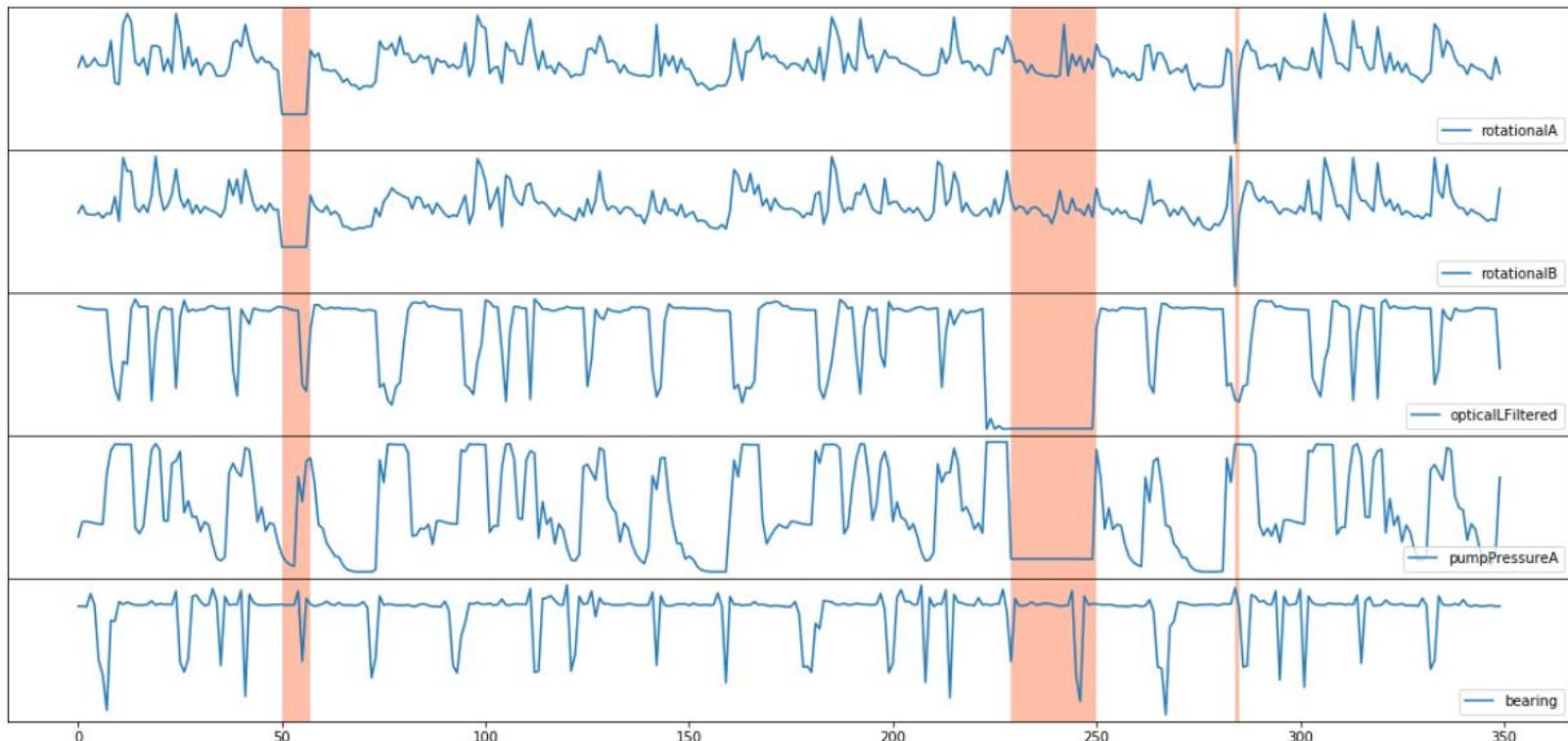


# Anomaly Detection Workloads



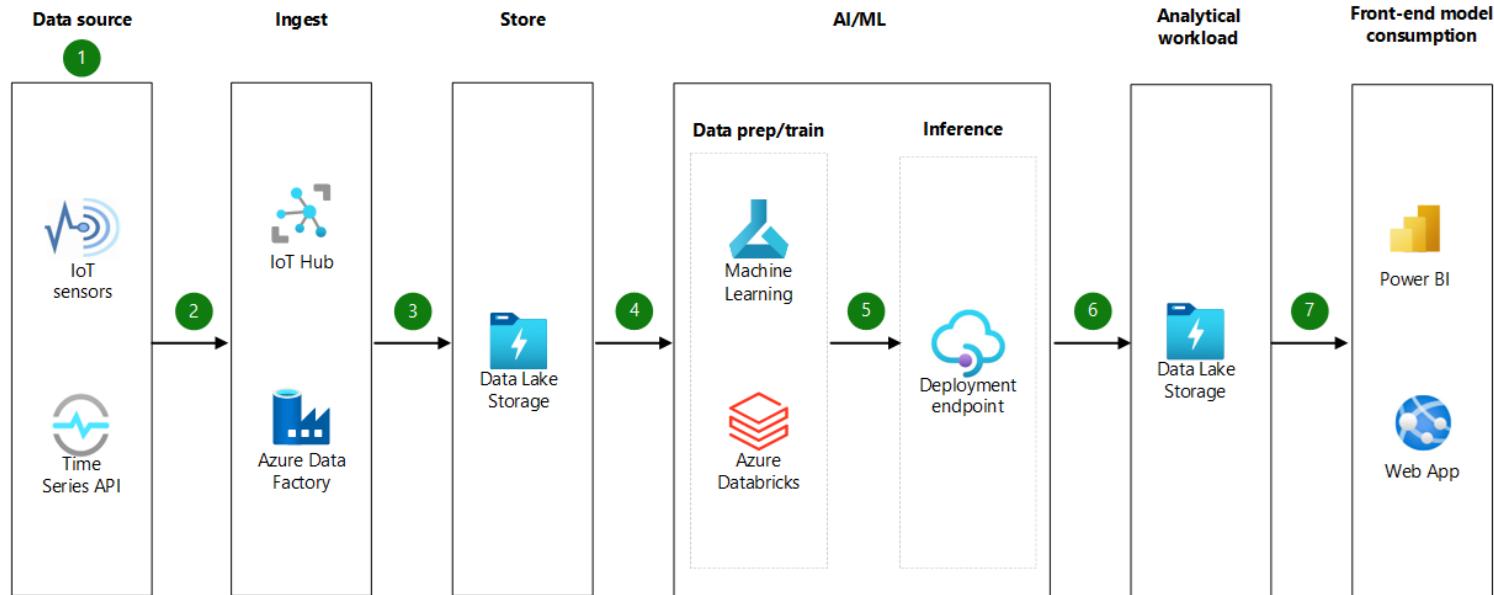


# Anomaly Detection Workloads



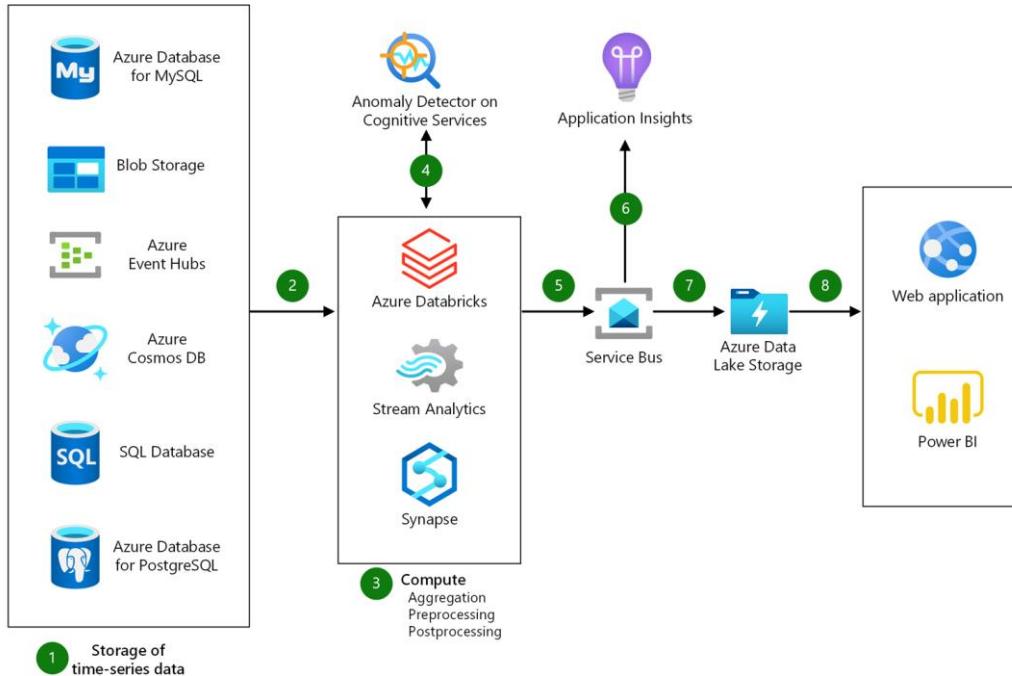


# Anomaly Detection Workloads





# Anomaly Detection Workloads



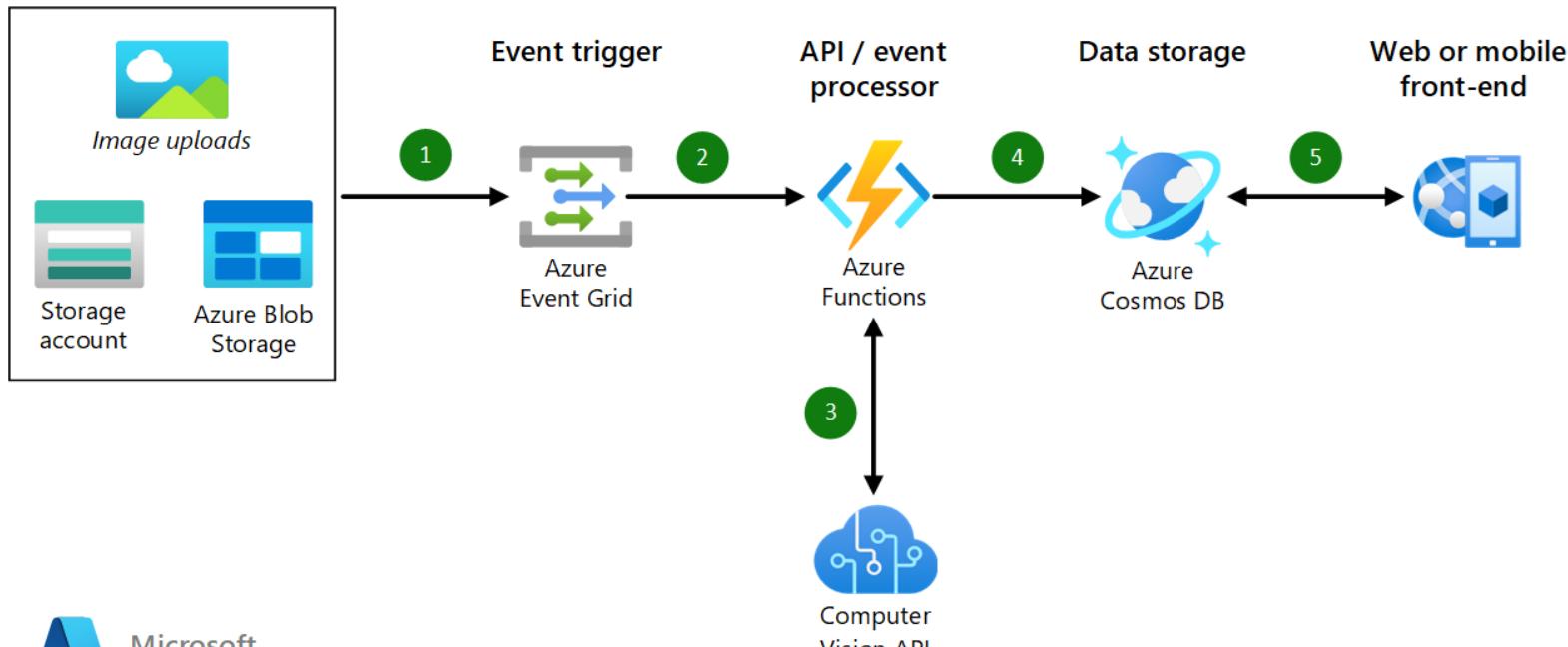


# Computer Vision Workloads





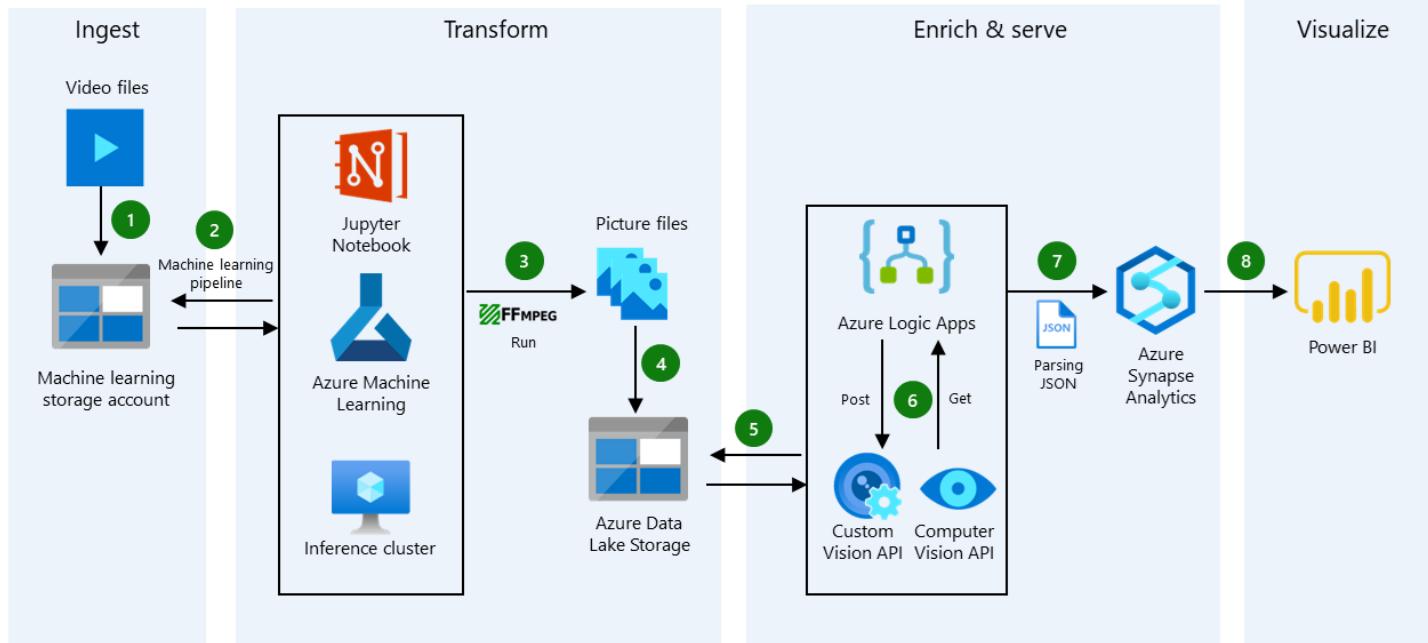
# Computer Vision Workloads



Microsoft  
Azure

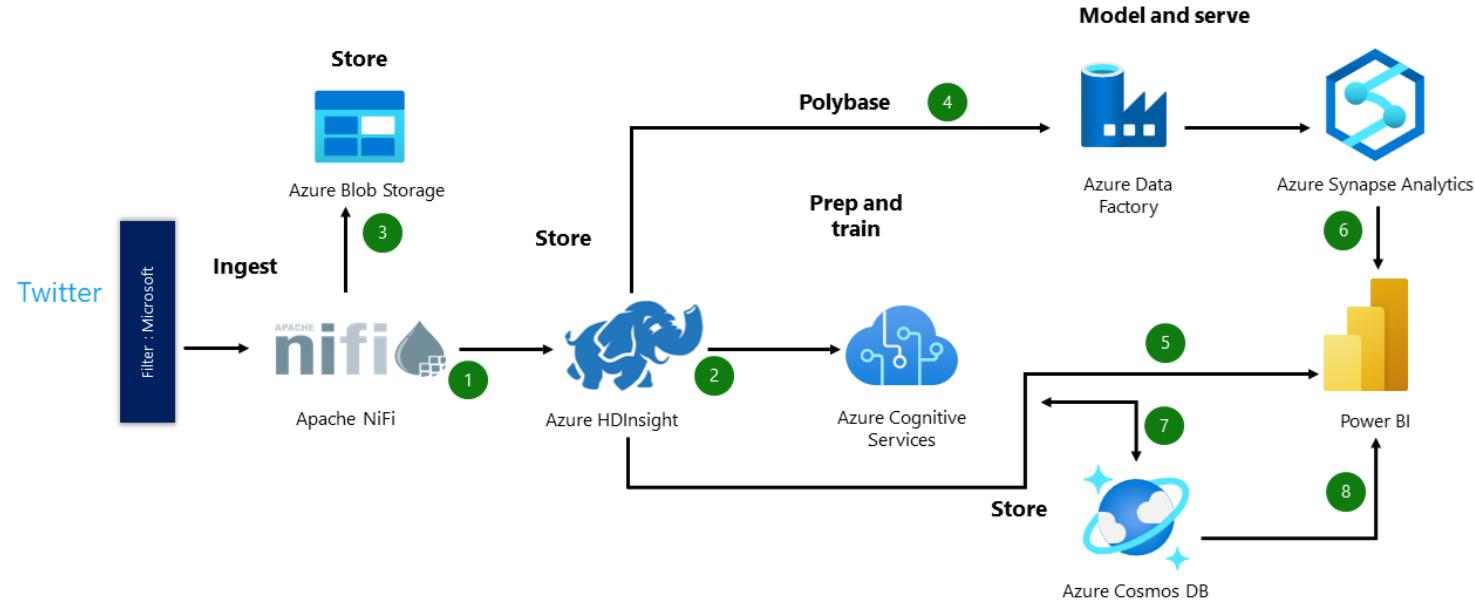


# Computer Vision Workloads



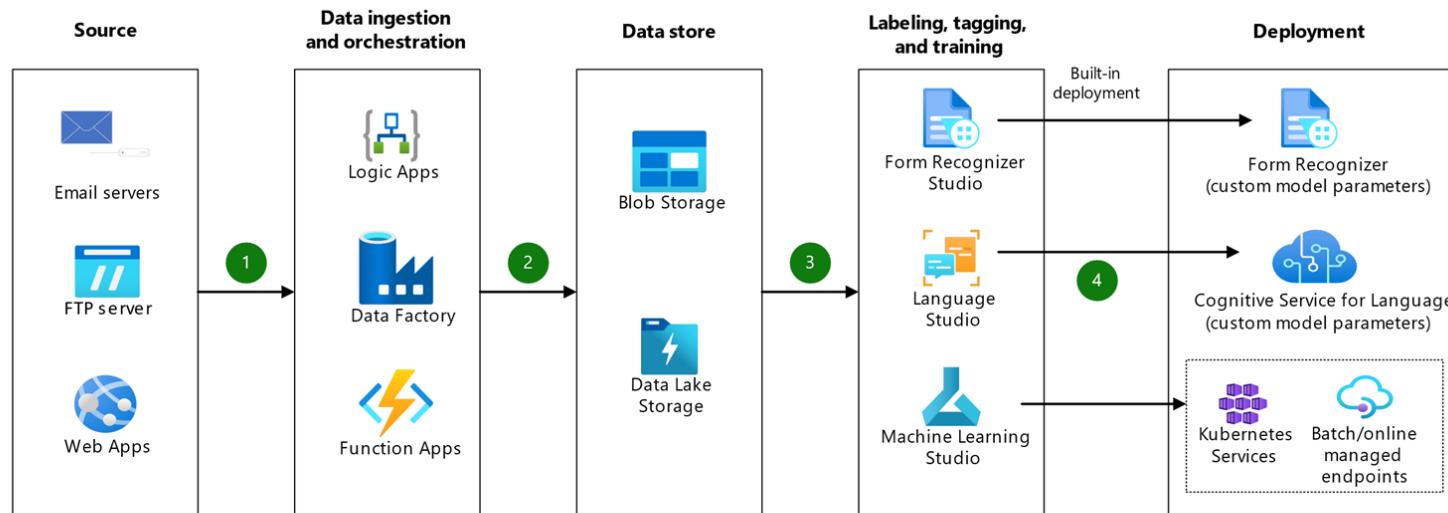


# Computer Vision Workloads



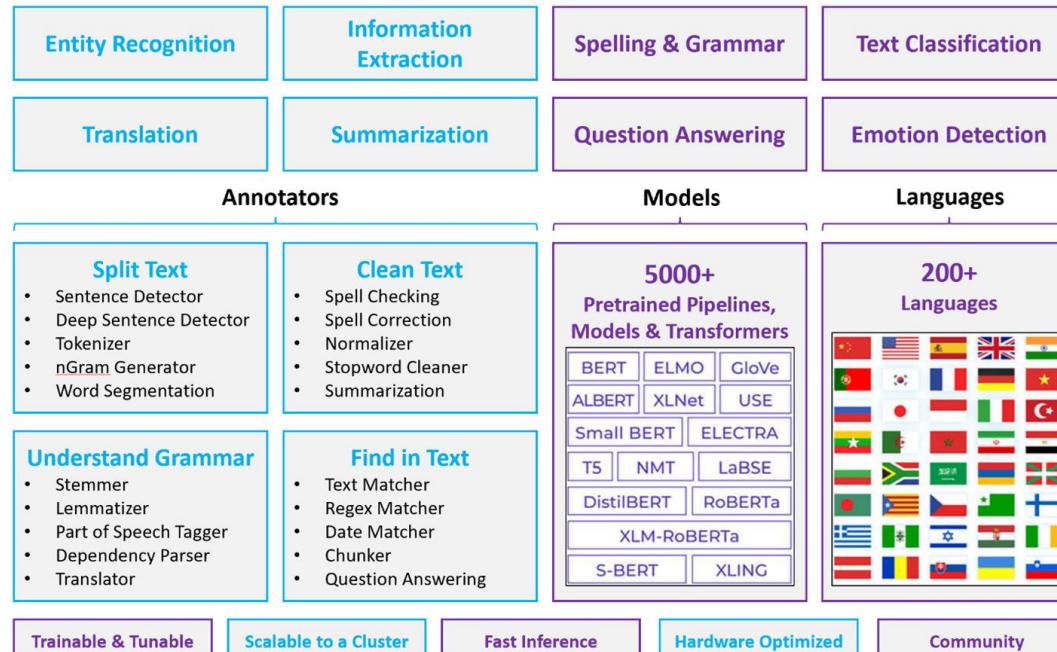


# Computer Vision Workloads



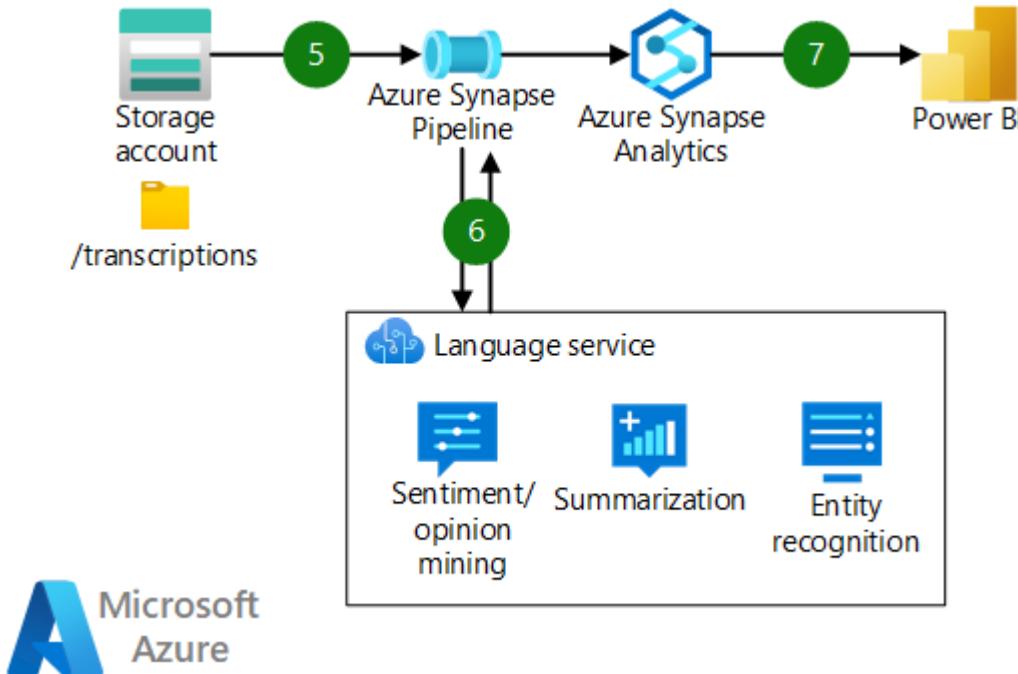


# Natural Language Processing Workloads



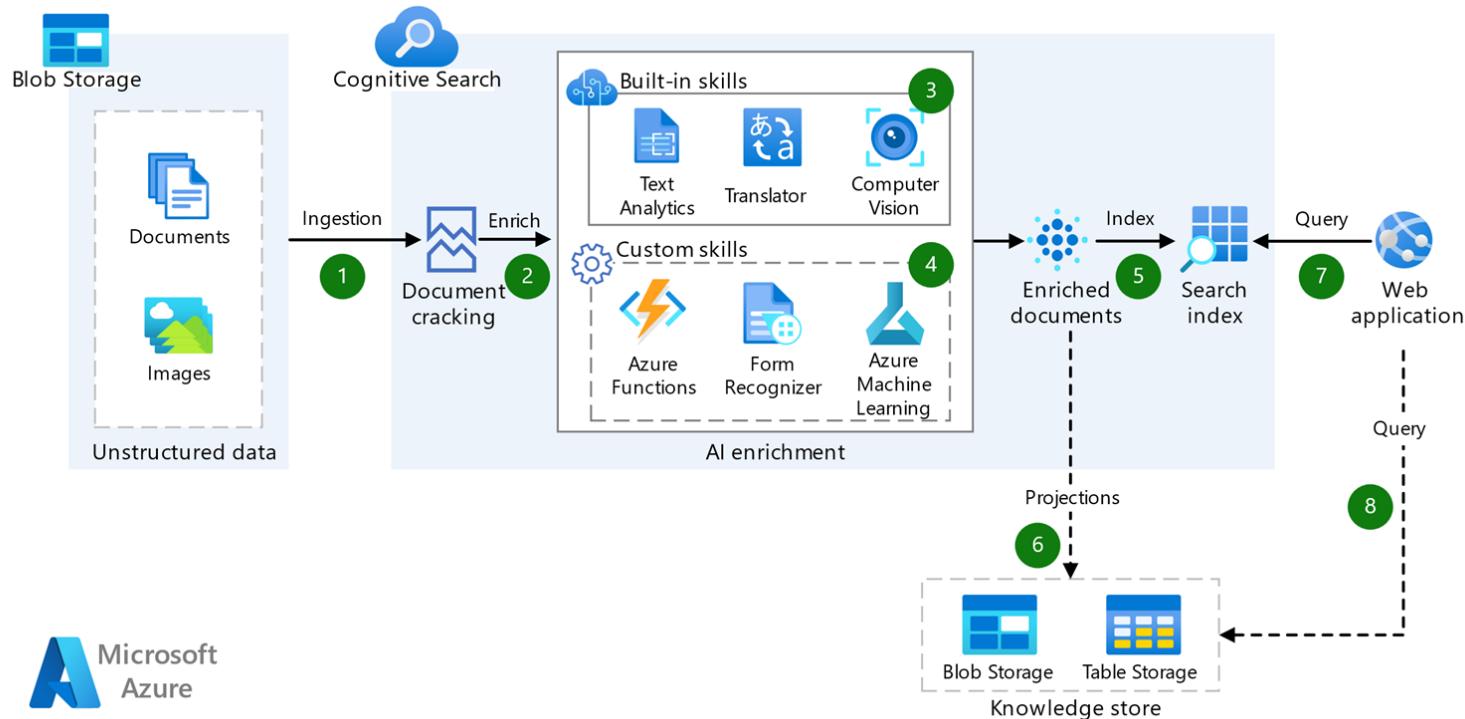


# Natural Language Processing Workloads



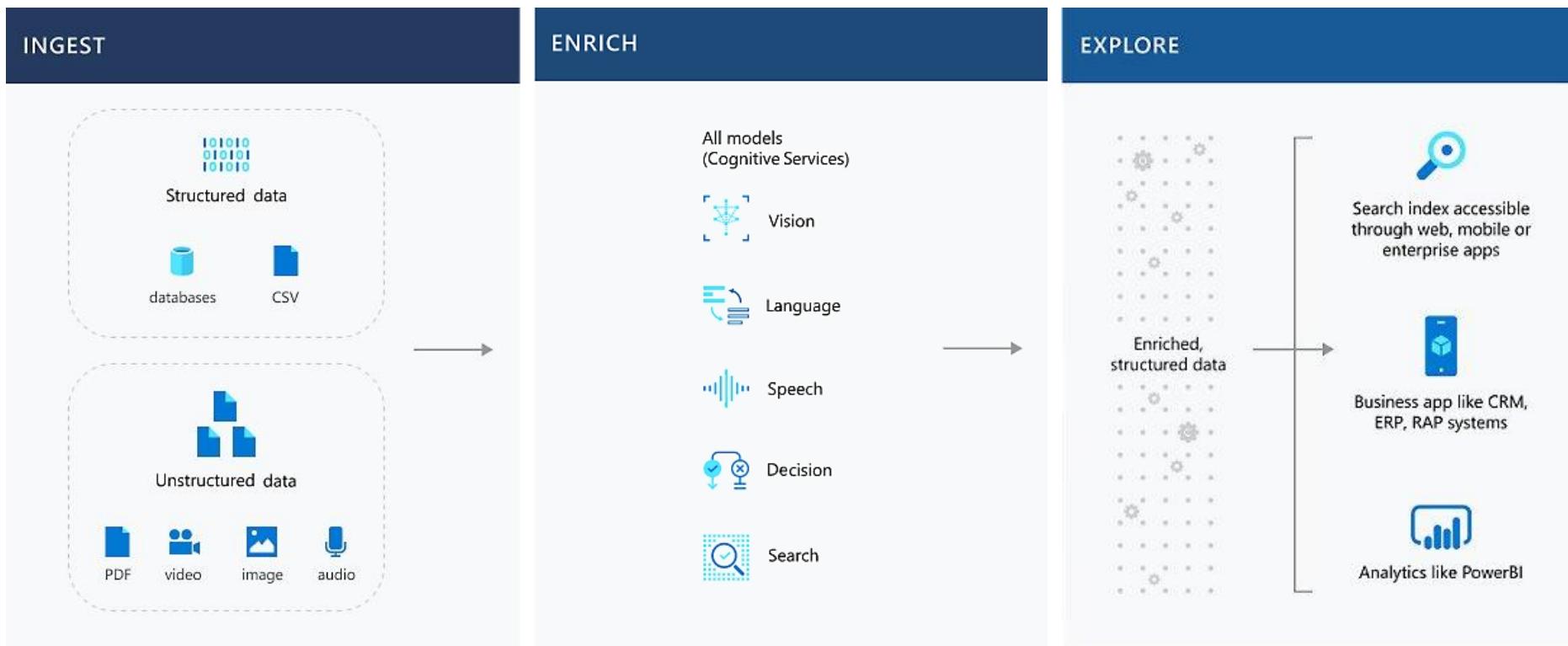


# Natural Language Processing Workloads





# Knowledge Mining Workloads





# Knowledge Mining Workloads



## [Azure Cognitive Search](#)

Identify and explore relevant content with the only cloud search service with built-in AI capabilities.



## [Azure Cognitive Services](#)

Employ cognition capabilities to expand understanding across content types.



## [Azure Machine Learning](#)

Apply machine learning models as custom skills for specific requirements like industry-specific regulations.

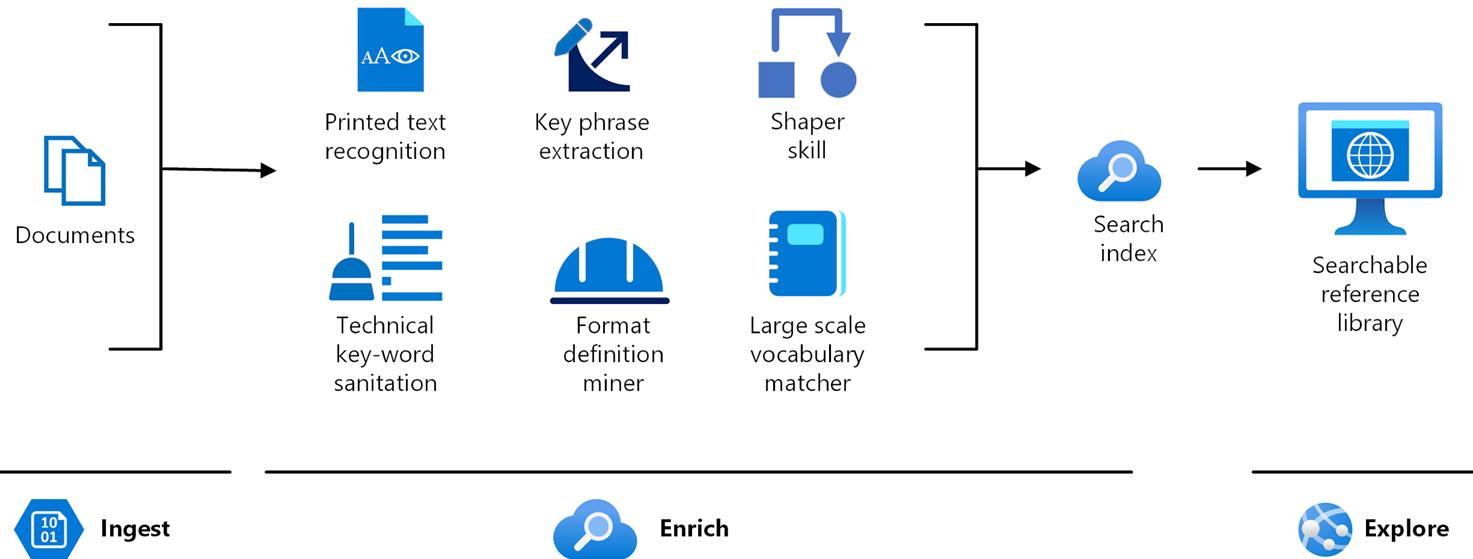


## [Azure Bot Services](#)

Design interactive experiences that enable users to extract information from their data via bot interface.

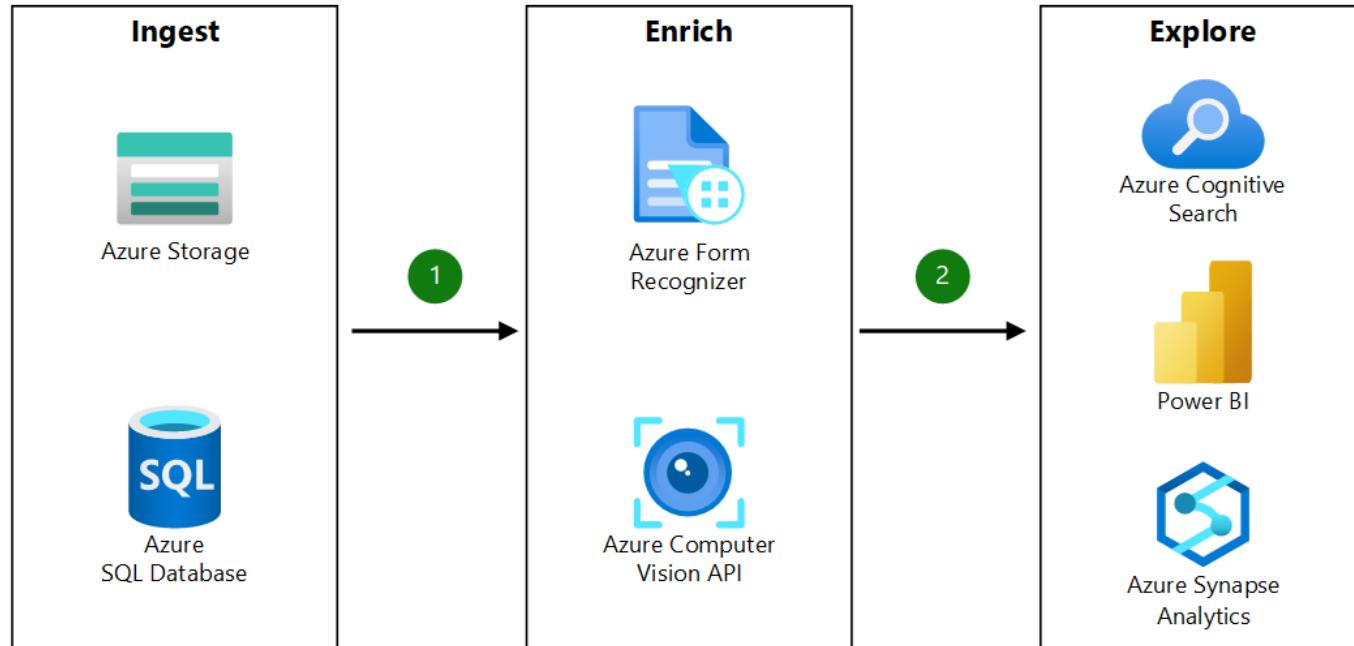


# Knowledge Mining Workloads



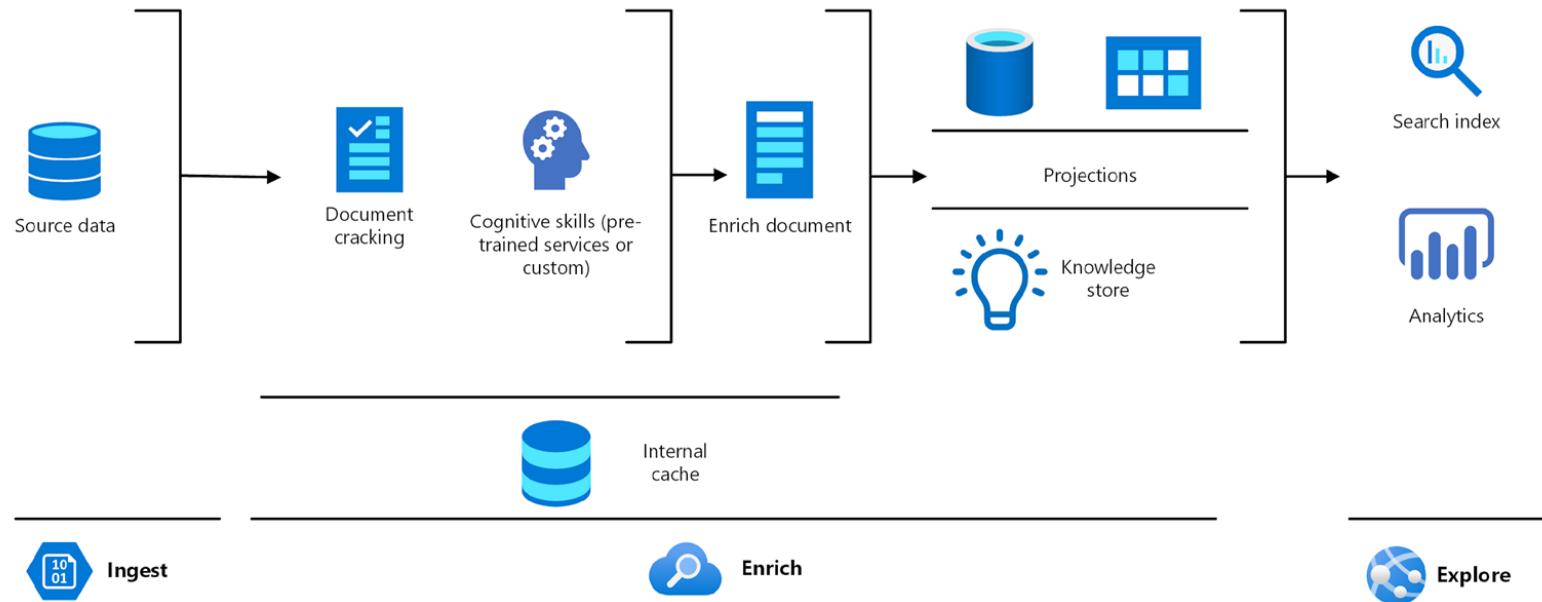


# Knowledge Mining Workloads





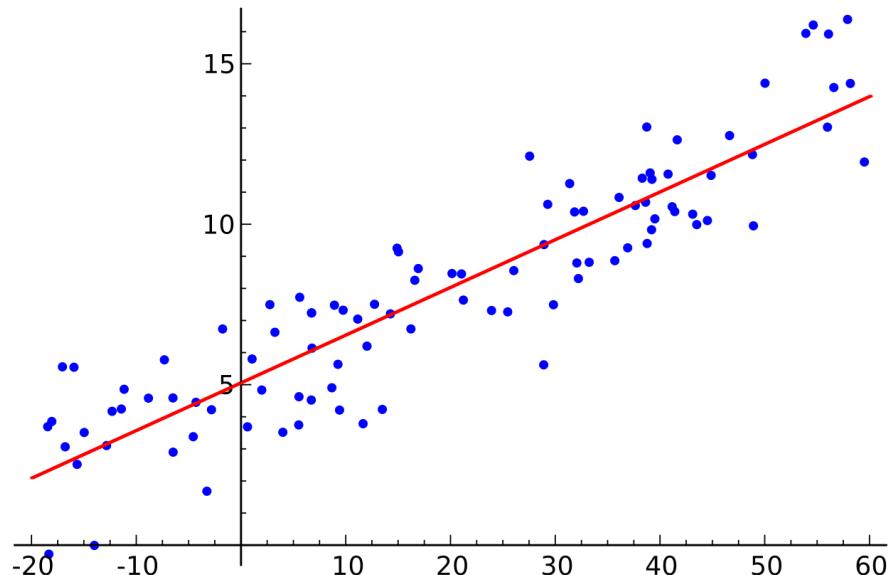
# Knowledge Mining Workloads





# Regression Machine Learning

- Estimate missing data
- Estimate future data (prediction)





# Classification Machine Learning

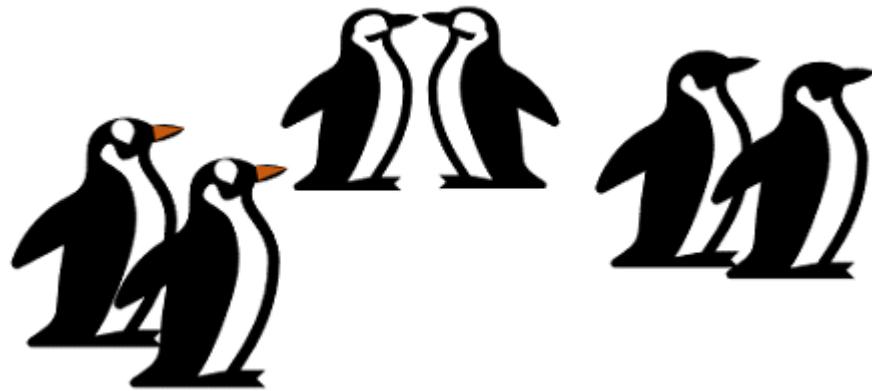
- Group images into categories

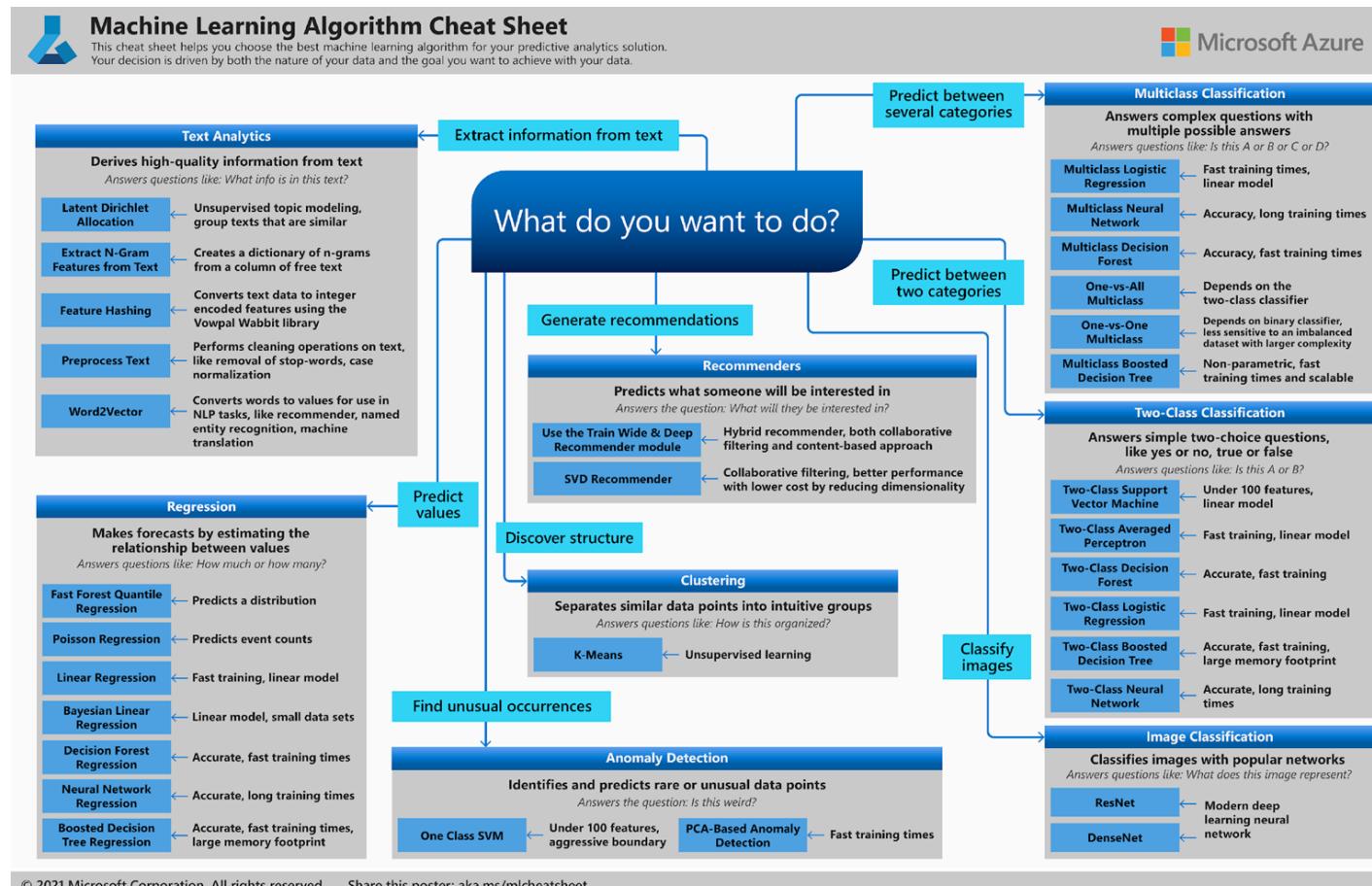




# Clustering Machine Learning

- Grouping unlabeled examples







Approach	Use Cases	Example Algorithms	Real-World Scenarios
Regression	Predicting a continuous outcome	Linear Regression, Ridge Regression, Lasso Regression	Sales forecasting, demand prediction, financial modeling
Classification	Assigning a label to input data	Logistic Regression, Decision Trees, Support Vector Machines	Email spam detection, sentiment analysis in customer feedback, image recognition in autonomous vehicles
Clustering	Grouping similar data points	K-Means, Hierarchical Clustering, DBSCAN	Customer segmentation for targeted marketing, anomaly detection in network security, organizing news articles into topics
Deep Learning	Complex hierarchical feature learning	Neural Networks, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN)	Image and speech recognition, natural language processing, self-driving cars



# The Exam



# AI-900 Exam FAQ

- Number of Questions: between 40 and 60
- Duration: 120 minutes
- Questions
  - See the [exam sandbox](#)
- There are no hands-on labs
- Pass Score: 700 (on a scale of 1-1000)



# AI-900

- Exam AI-900
- Skills measured
- Exam Sandbox



# Schedule exam

## Exam AI-900: Microsoft Azure AI Fundamentals

United States 

**Languages:** English, Japanese, Chinese (Simplified), Korean, German, French, Spanish, Portuguese (Brazil), Russian, Indonesian (Indonesia), Arabic (Saudi Arabia), Chinese (Traditional), Italian

**Retirement date:** none

Prove that you can describe the following: AI workloads and considerations; fundamental principles of machine learning on Azure; features of computer vision workloads on Azure; and features of Natural Language Processing (NLP) workloads on Azure.

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English (US)

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**Download**

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# Course Repository

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# Azure Cookbook

Recipes to Create and Maintain Cloud Solutions  
in Azure



Reza Salehi



# Thank you!

**Reza Salehi**

**[linkedin.com/in/rezasalehi2008](https://www.linkedin.com/in/rezasalehi2008)**