Azure AI Fundamentals AI-900

Predictions Vs Forecast

Prediction is a kind of estimation before occurrence of event.

A forecast, unlike prediction, must have a logic to it.

ML->foundation to AI system.

Relationship found in the data

Train machine learning Models.

Make predictions and inferences.

Forecast vs Prediction

Difference is the explicit addition of time element

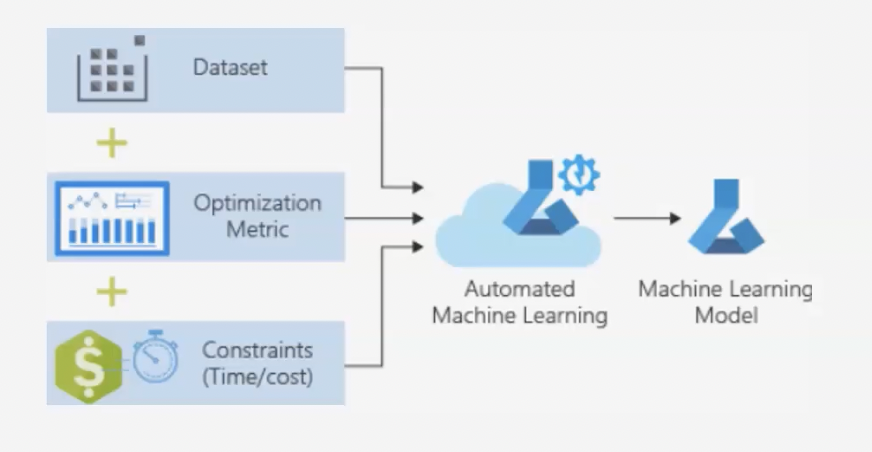
Forecast is scientific, free from intuition and personal bias.

Prediction is subjective and fatalistic in nature.

Forecasting is extrapolation of past while prediction Is judgmental

Forecasting utilized in predicting weather, Prediction is utilized in economics.

Forecasting and Predictive Modelling



Tools to address data challenges.

Forecasting and predictive modelling

Data mining and probability to forecasting.

AML algorithm like Decision jungles.

Forecasting and predictive modelling sounds similar while both are different.

Predictive data modelling is a form of AI that uses data mining and probability to forecast and estimate more granular and specific outcomes.

Azure machine learning features a palette of modules to build a predictive model including state of art machine learning algorithms such a scalable boosted decision tree,Bayesian recommended systems, deep neural networks and decision jungles.

Features of Anomaly detection

Anomaly detection: - it is a machine learning techniques that analyzes data over time and identify unusual changes.

Anomaly detections aims at unexpected events on rare items in the data.

Accurate Anomaly Detection prompts to trouble shooting that helps to revenue loss and brand reputation.

Automatically detect anomalies throughout your time series data.

Detect anomalies throughout dataset in real time

Detect anomalies throughout dataset as a batch

Detect change points throughout dataset as a batch.

Get additional information about dataset.

Adjust anomaly detection boundaries.

Features of Computer Vision

After We have created a suitable azure subscription, we can use Azure Computer vision you can submit images to Vision Service in order to perform a wide range of analytical task.

1. Azure Computer vision can Describe an Image.

Use Azure Computer Vision in order to perform a Wide range of analytical tasks based on Images.

1. Tag Visual Features

Image descriptions generated by Computer Vision are based on a set of recognizable objects which can be used to suggest tags on image.

So that after that we can search images with specific attributes.

1. Detect Objects

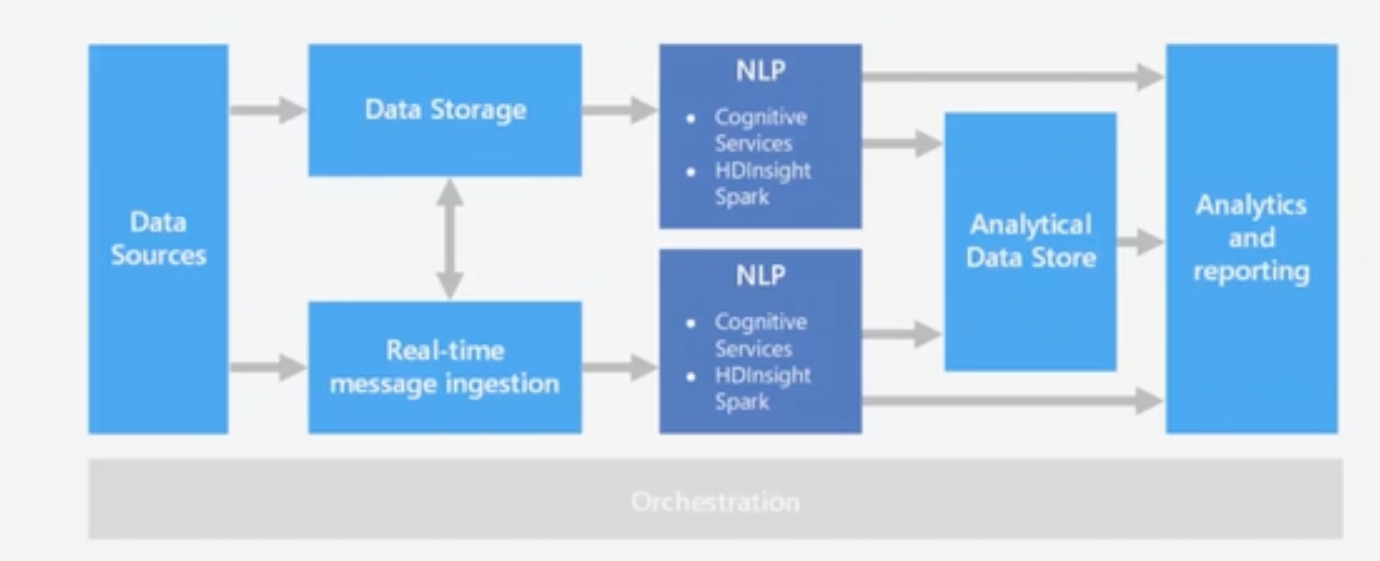
The objects detection capability is similar to tagging the service a=can identify common objects, this service can also return bounding box co-ordinate.

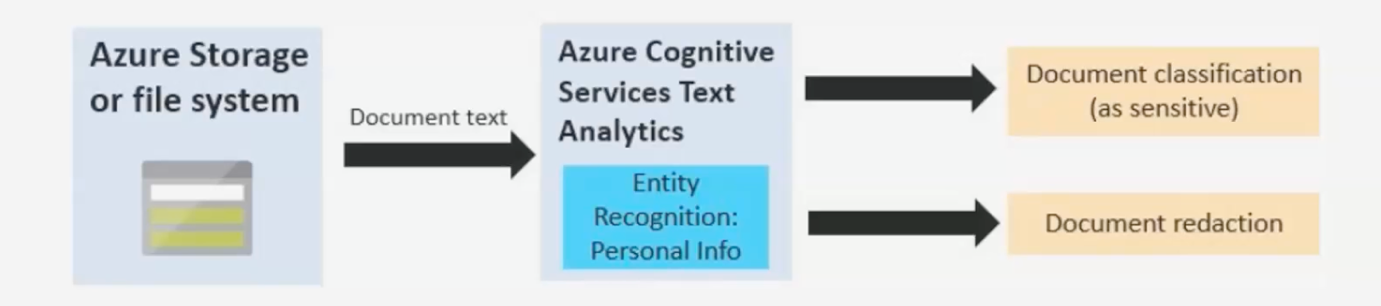
1. Detect brands

Computer Vision Features also provide the ability to identify commercial brands

1. Extract Text

Features of Natural Language Processing





NLP can be used to Classify Documents such as Sensitive Documents or Spam documents etc.

Key Features of NLP are:



Key Phrase Extraction

Entity Recognition

Sentimental Analysis

Language Modelling

Speech Recognition

Uses of NLP

Classify Documents

Summarize the text

Search and Retrieval

Score Test Sentiment



Following Azure Services Provides NLP services

Microsoft HDInsights with Spark

Microsoft Cognitive Services

Azure Databricks

NLP service in Azure-Ask Yourself

Do you want to use prebuilt Models?

Do you need to train custom models against large datasets

Do you need Low-level NLP capabilities?

Do you need simple, high-level NLP capabilities?

Features of Conversational AI

Azure Bot service

Microsoft Healthcare BOT

Customizable

For healthcare bot

To create conversational AI solutions, we can use

QnA maker Service

Web Bot Service

QnA maker is a cognitive service

That helps us quickly build the base of Knowledge and answers that can form the basis of AI agent.

Web Bot service provides us a platform for Creating, publishing and managing bot services.

Fairness in AI solution:

Graphical user interface, application

Description automatically generated

Six principles of AI solution

Diagram

Description automatically generated

Trust is core of AI services.

Types of Harm by Ai systems

Unfair behavior of an AI system

Harm of Allocation

Harm of Quality of service

Reliability and Safety in AI

Automation Bias

Shortcoming in AI

AI automation in healthcare Systems.

Unexpected failures of AI models can be critical

Training vs Execution environment mismatch

Shortcoming in AI systems affect reliability.

The errors can be

“Known” Unknow

“Unknown” Unknown

Privacy and Security in AI

Large datasets with personal details like names

Data subjects to privacy or security concerns

Technical measures for protecting privacy

Techniques using suppression and aggregation

Traditionally researchers used to train the raw data where confidential data may get leaked.

But now

Diagram

Description automatically generated

And still MS is working for more safety and security of data.

Inclusiveness in AI

Empower and engage everyone

Benefits to all parts of society

Inclusive design tools and processes

Expanded to areas of exclusion

Categorized of AI biased

Chart, diagram, sunburst chart

Description automatically generated

Transparency in AI

Interpretability or intelligibility

Purpose and limitation of the system

Mitigation of Unfairness

Gaining trust from users.

Unfairness and trust lead to more usable products

ML systems make it easier identify and fix bugs

Design and evaluate methods to achieve intelligibility

Make existing intelligibility tools more useable

InterpretML

Open source package that tells us

Why did my model make this mistake?

Does my model discriminate?

How can I understand and trust the model’s decisions?

Does my model satisfy legal requirements?

Accountability in AI solution

AI designer accountable for how their systems operate

Work within frameworks organizational principles

Clearly defined policies and procedures

Designer & developer responsible to understand policies

Communicate guidelines with the users and partner

Periodic reviews and offline evaluation.