



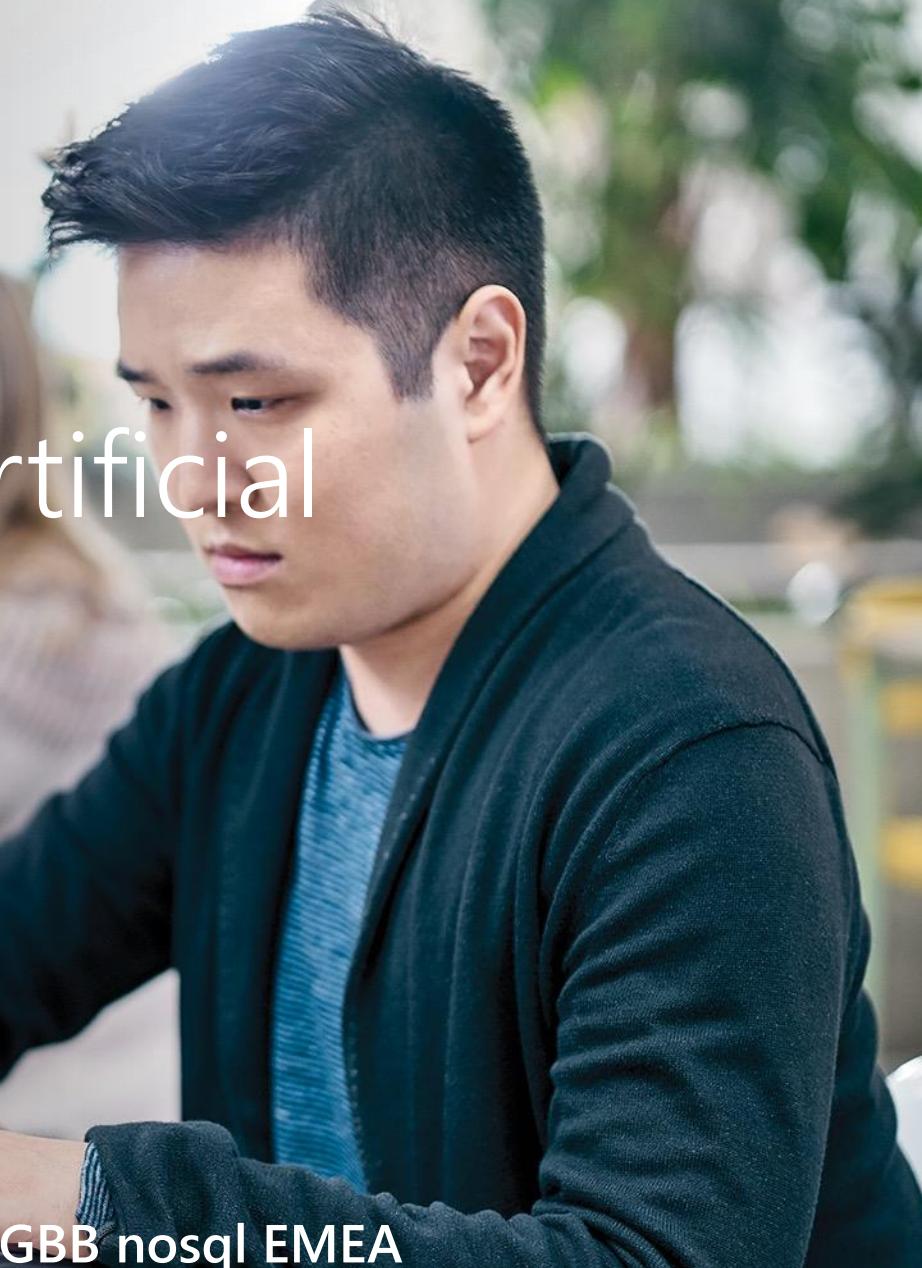
Azure Cosmos DB And Artificial intelligence services



Franck Gaillard CSA IA & ML



Emmanuel DELETANG GBB nosql EMEA



Agenda

- Cloud native application
- Use Cases
- Architecture sample
- Cosmos dB Deep dive
- Artificial intelligence services
- Demo
- Roadmap

Cloud native apps





Backlog of apps keeps growing

500M the projected global number of net new
cloud native applications by 2023

2023

New applications

Source: IDC FutureScape, Worldwide IT Industry 2020 Predictions

Developer Velocity matters

Stronger developer velocity means more successful developers and better outcomes for your business

- ✓ Higher revenue growth
 - ✓ Higher developer satisfaction and retention rates
 - ✓ Higher innovation
 - ✓ Improved collaboration
 - ✓ More satisfied customers
 - ✓ Better software

Microsoft Cloud



Microsoft
Visual Studio

GitHub

Identity



Security

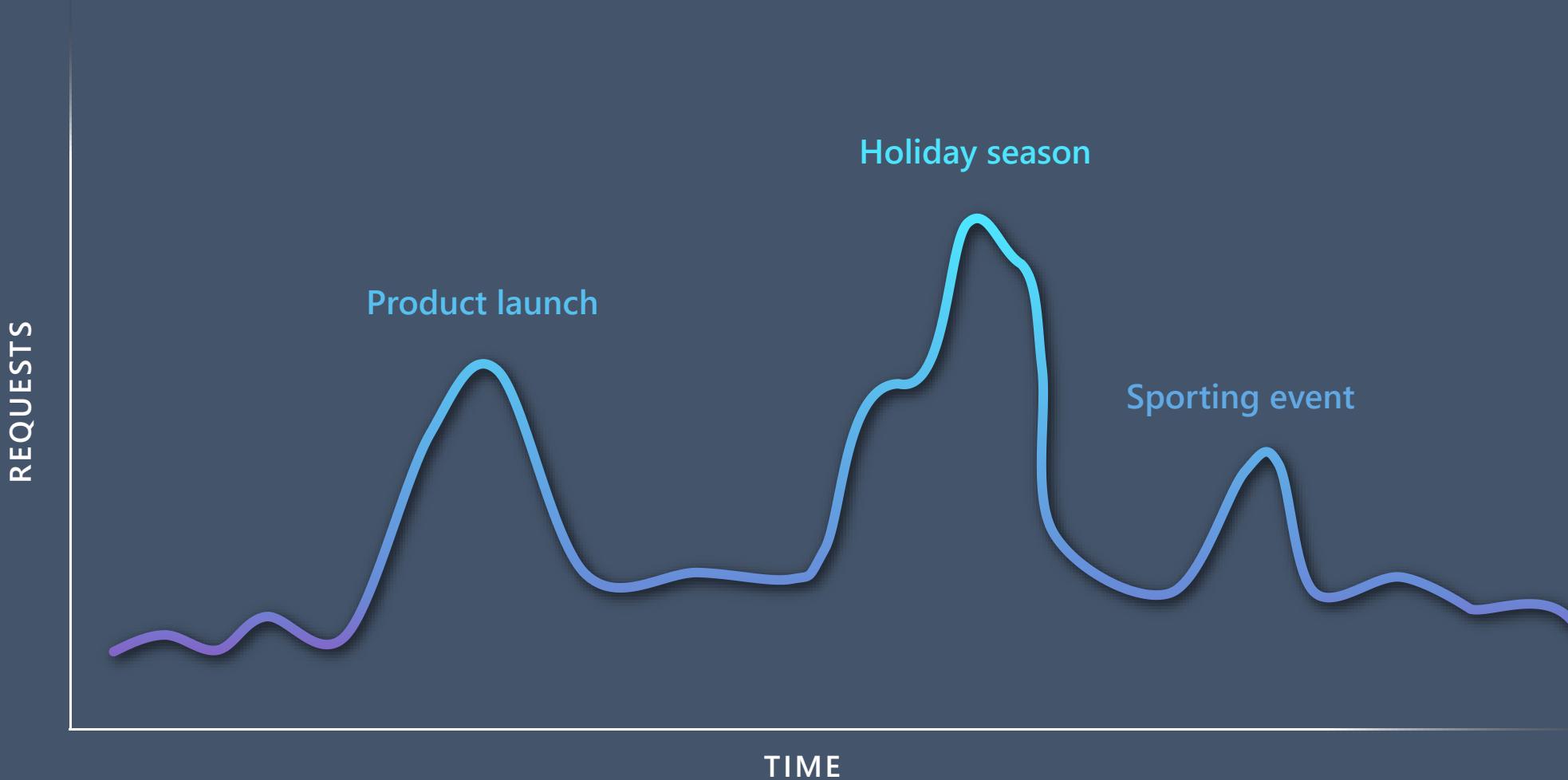
Microsoft 365

Dynamics 365

Power Platform

Azure

Elasticity of demand



Why cloud-native is important

Scale to meet any demand

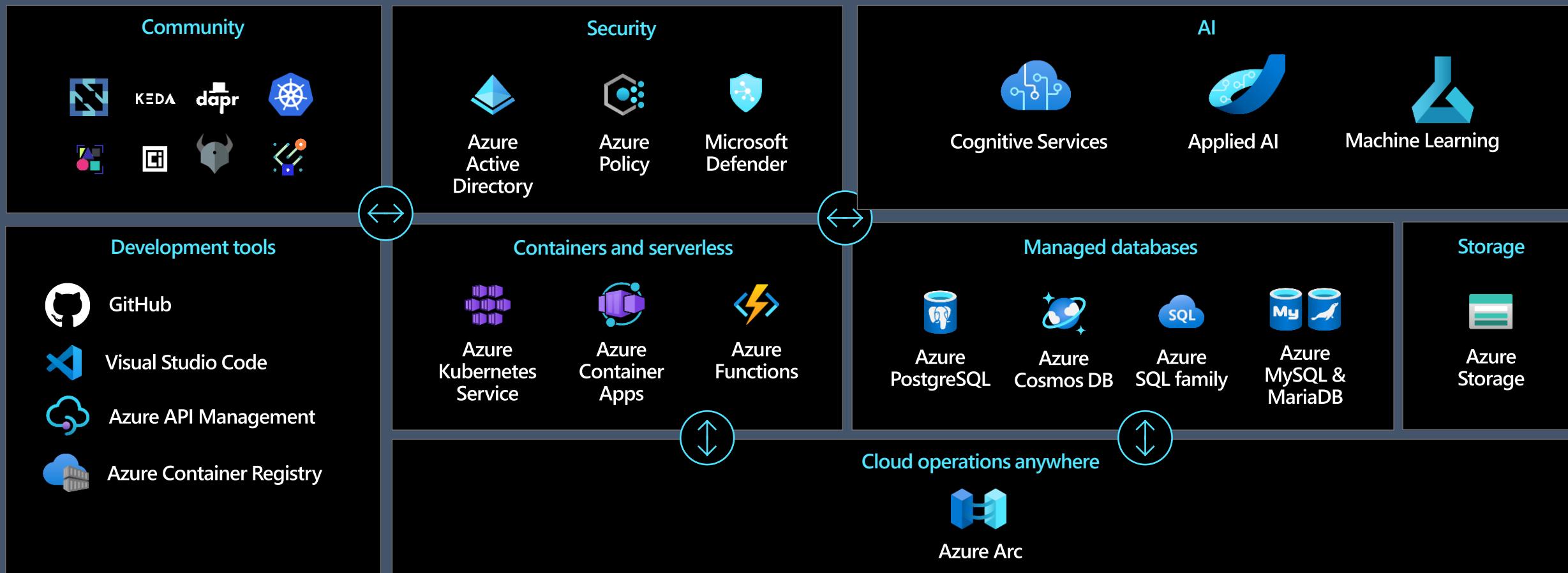
Achieve greater resiliency

Deliver better apps faster

What is cloud-native?



Building cloud-native on Azure



Use cases

Customer Stories

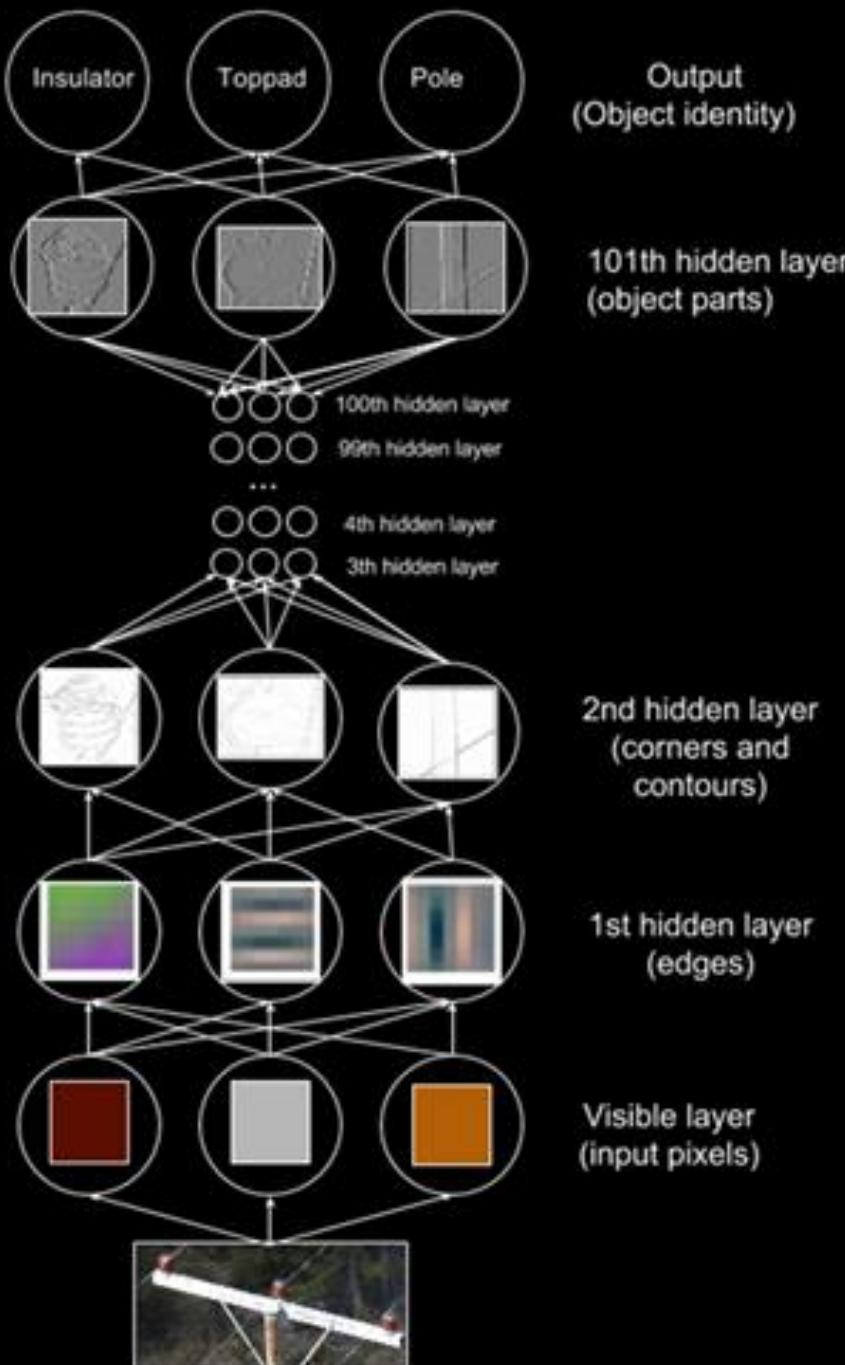


Connected Drone (powered by Azure)



eSmart Systems

e-on



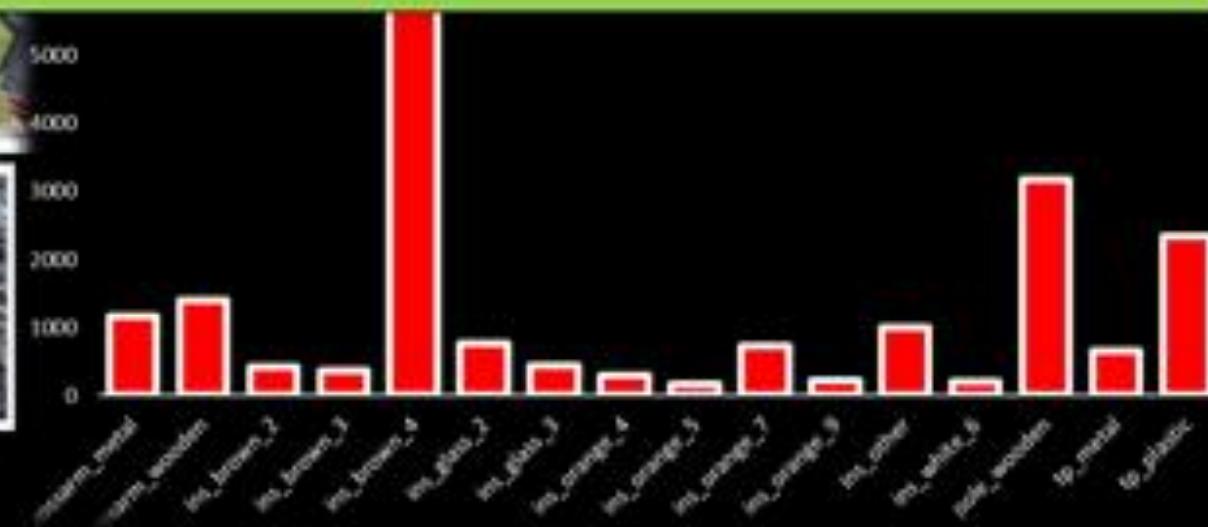
Very Deep Neural Nets For Object Recognition

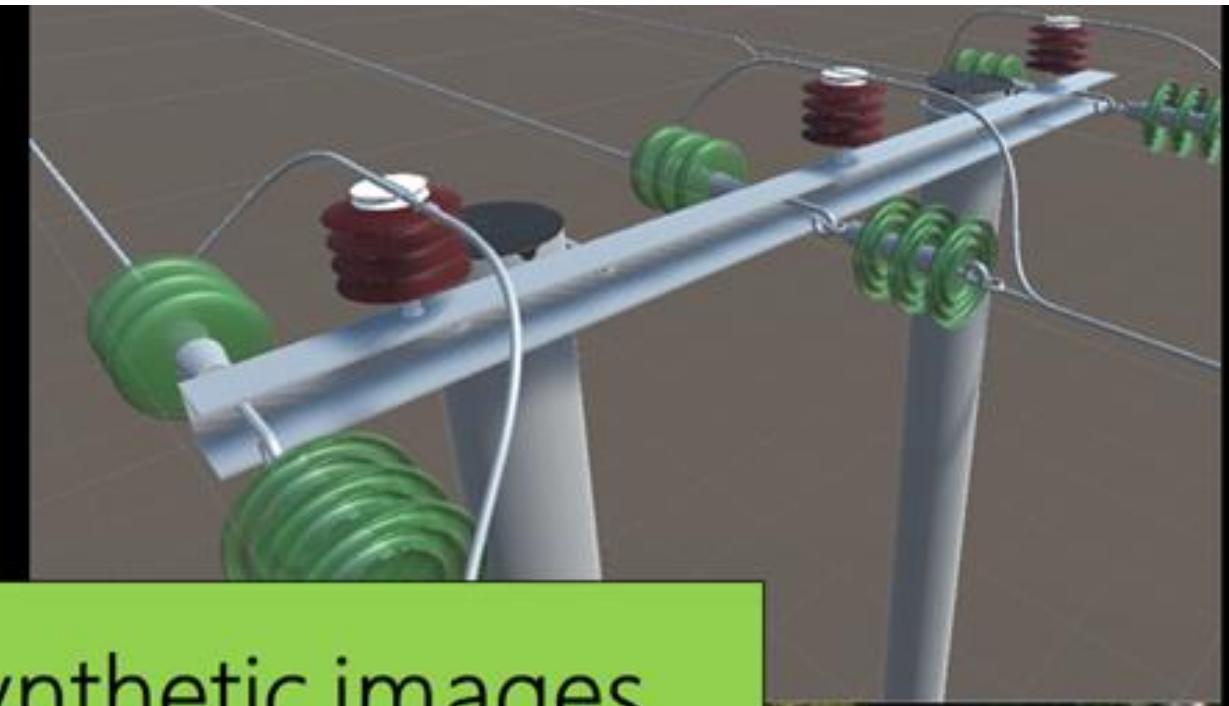
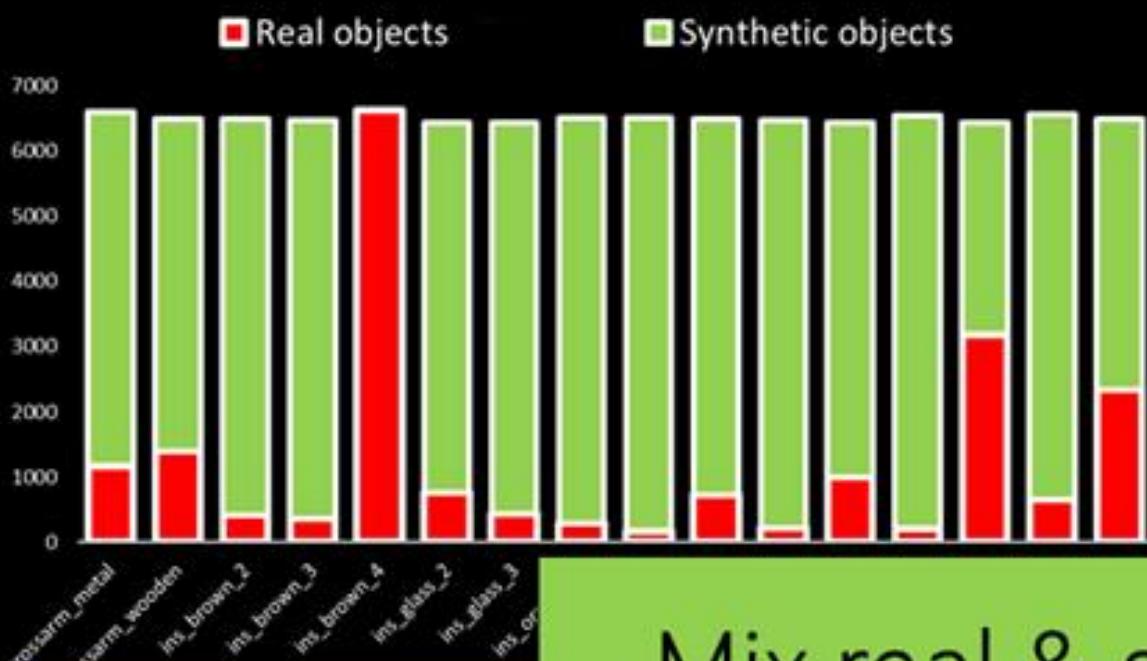
- Faster R-CNN
 - Region Proposal Network + Fast R-CNN Detector
 - Fast Region-based Convolutional Network
- YOLO
 - You Only Look Once
- SDD
 - Single Shot MultiBox Detector



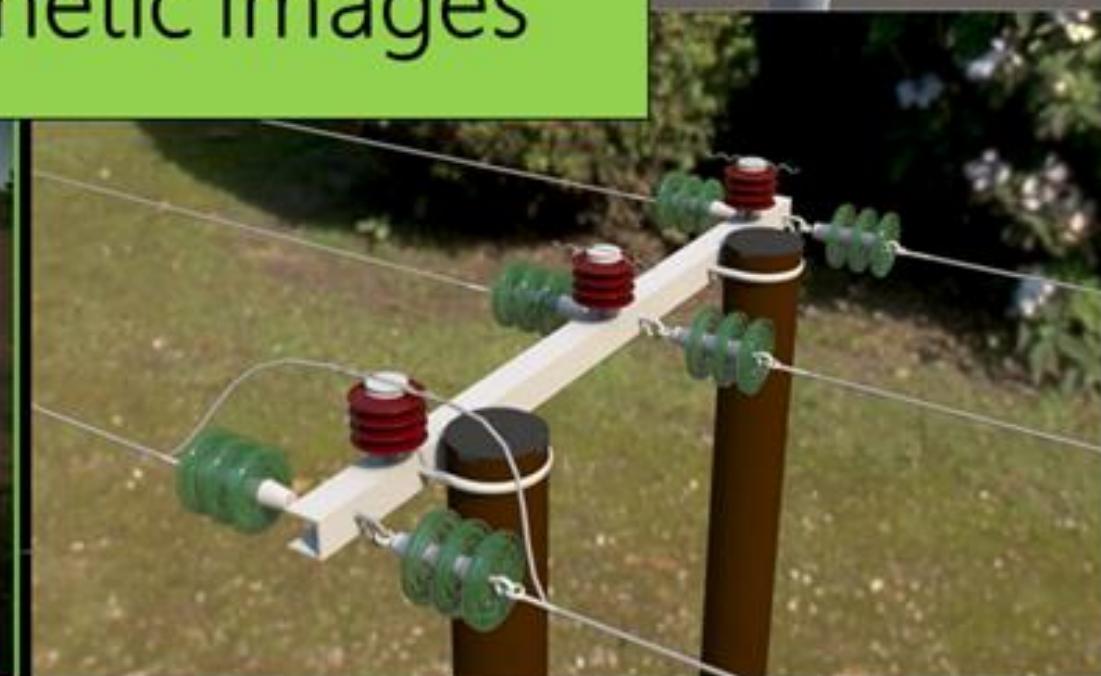


The challenge of class imbalance





Mix real & synthetic images



 eSmart Connected Drone

DASHBOARD



Main Dashboard

GUDBRANDSDAL ENERGI NETT

19.9.2016

INSPECTIONS



INSPECTION PLANNER



DRONE FLEET



SYSTEM STATUS



EXPERT MODE



JOB ORDERS



POWERLINES

OBSERVATIONS

TOTAL INSPECTIONS

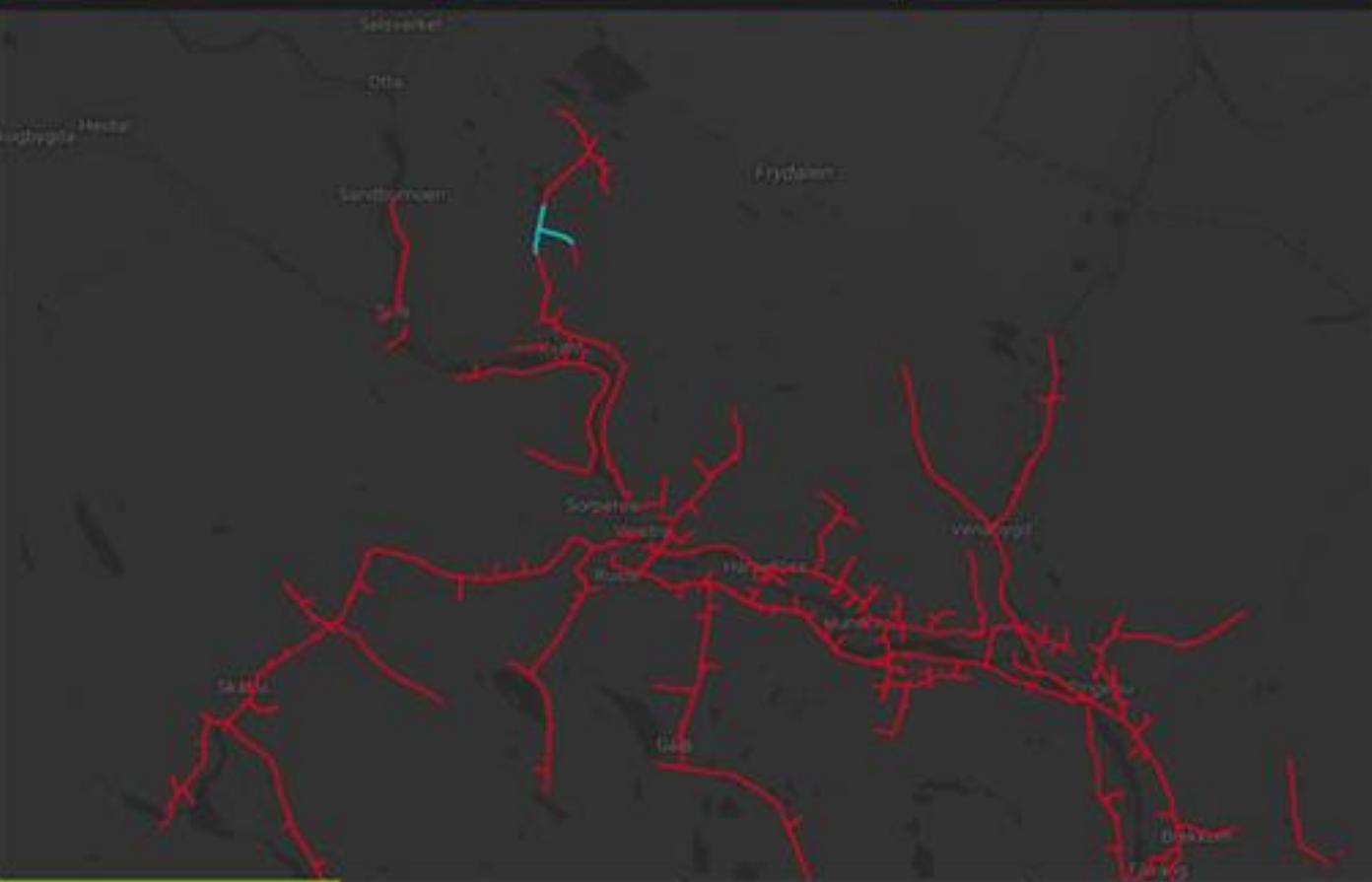
COMPLETED INSPECTIONS

213 power lines

6 observations

33 inspections

32/33 checked



ID	LINE	DATE
27831	1.4.4	12.09.16
34534	1.4.17	03.04.16
12432	3.2.8	04.02.16
93423	1.1.15	01.01.16
67341	2.1.18	07.12.15
43432	1.9.8	03.12.15
12643	3.5.7	04.11.15
32312	5.3.5	24.09.15
52371	2.3.6	14.03.15
12631	2.1.13	02.01.15
41364	1.6.3	15.11.14
92571	1.4.6	24.08.14
06056	3.2.3	31.03.14
12506	1.4.21	10.03.14
15021	2.1.18	18.02.14

NEW

PLANNED

COMPLETED

OBSERVATIONS

Andrew Jones
Consultant

eSmart Connected Drone

DASHBOARD



INSPECTIONS



RINGERBU



RISDAL



TRETTEN



VINSTRA



14.4-12-09-16



AUTO



MANUAL



REPORT



INSPECTION PLANNER



DRONE FLEET



SYSTEM STATUS



EXPERT MODE



JOB ORDERS



Vinstra

14.4-12-09-16

12.9.2016



NUMBER OF OBJECTS

ACCURACY

NUMBER OF OBSERVATIONS

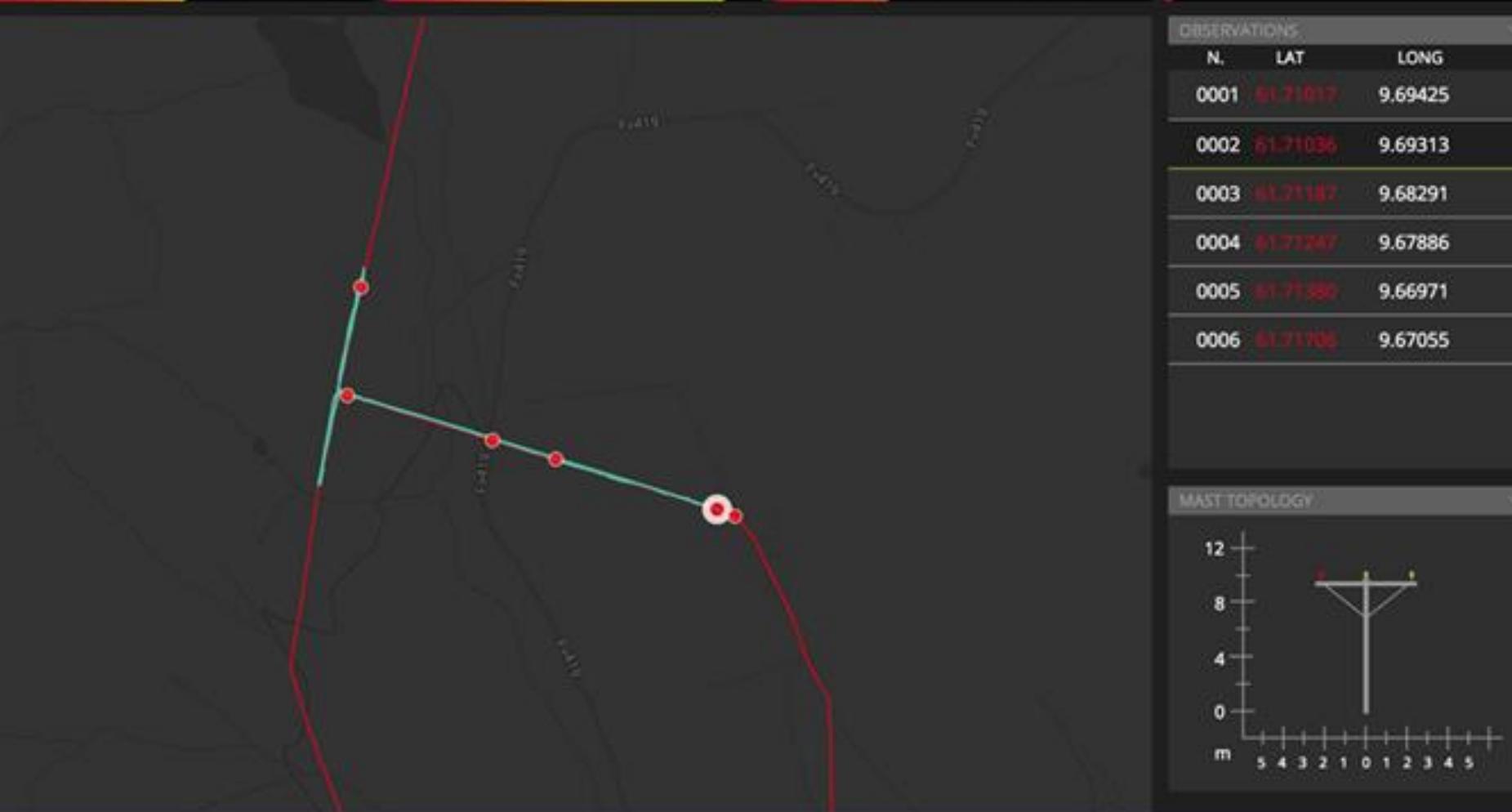
PROGRESS

217 objects

90 %

6 observations

0/6 checked





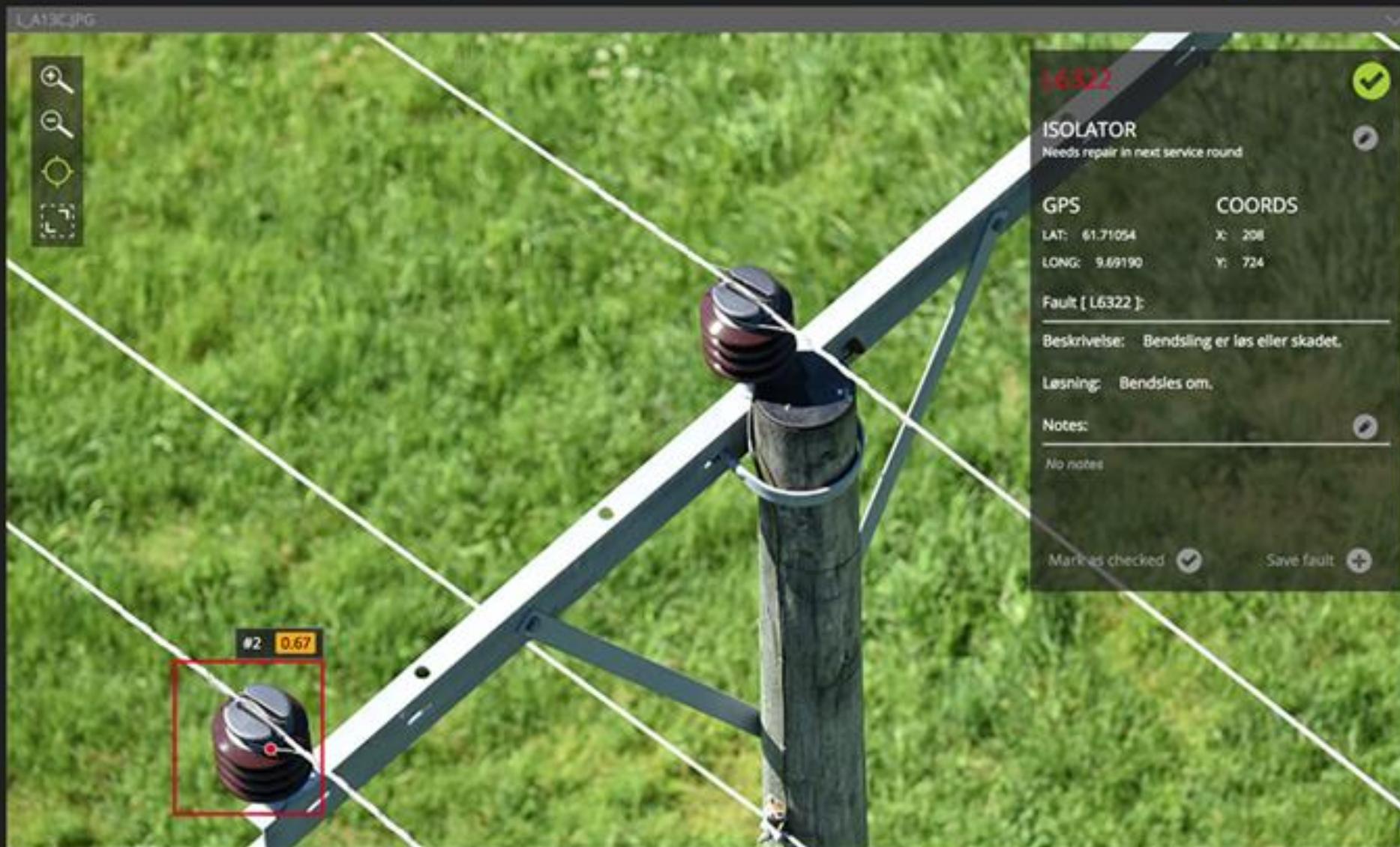
Observations

IMAGE DETAIL: L_A13C.JPG

Image Quality

1 2 3 4 5 6

Submit



MAST TOPOLOGY

Type 1 - Single Mast

Edit



Type Unknown



FAULTS

MAST INVENTORY

L_A13C.JPG 4

Insulator 2

 Insulator Insulator

Power Line Tower 2

 Pole Crossarm

DETAILS



[Video](#)

Customer:
Nuance Communications

Industry:
Partner Professional Services

Size:
1,000–9,999 employees

Country:
United States

Products and services:
Microsoft Azure
Azure Blob Storage
Azure Container Registry
Azure Cosmos DB
Azure Kubernetes Service
Azure Machine Learning
PyTorch Enterprise

[Read full story here](#)

Nuance is now looking to further accelerate its AI model training by using PyTorch together with [Azure Machine Learning](#), which provides fully managed high-performance computing CPU and GPU clusters. "We take things to another level with Azure Machine Learning because we can basically create infrastructure for training our models as we go," continues Jancsary. "We've found PyTorch and Azure Machine Learning to be very powerful together."

Nuance also uses [Azure Cosmos DB](#), [Azure Blob Storage](#), and [Azure Container Registry](#) to support DAX, which has a fully containerized back end. Build artifacts are stored in Container Registry, and the execution of these images is hosted on [Azure Kubernetes Service](#). At the cloud ingress, Azure Cosmos DB is used to synchronize and coordinate audio upload from multiple parallel clients. The intermediate and final output of processing steps persists in Azure Blob Storage. "We architected our whole solution on Azure, which shows how much the platform has to offer," says Gallopyn. "We have a leg up on security and privacy that would have been more difficult to achieve in our own datacenters."



"With support from Azure and PyTorch, our solution can fundamentally change how doctors and patients engage and how doctors deliver healthcare."

—Guido Gallopyn, Vice President of Healthcare Research, Nuance

Situation:

Nuance knew that doctors spend a lot of time entering patient visit notes into electronic health records during and after a visit. It wanted to create an AI-based clinical solution to help reduce that time and enhance the patient experience.

Solution:

The company built a conversational AI solution called DAX using Microsoft Azure Machine Learning and PyTorch to run models and iterate quickly. DAX automatically captures doctor-patient conversation, converts it to text, and formats it for the correct medical chart.

Impact:

By adopting DAX in their practices, doctors are realizing significant time savings that lighten their load and give them more time for focused patient care. Ultimately, by reducing administrative burden, Nuance aims to help decrease doctor burnout and improve the patient-provider experience.





Customer:
Walgreens

Industry:
Retailers

Size:
10,000+ employees

Country:
United States

Products and services:
Microsoft Azure
Azure Cosmos DB
Azure Databricks
Azure Data Lake Storage
Azure SQL Database
Azure Synapse Analytics
Microsoft Consulting Services
Power BI

[Read full story here](#)



"At peak times, our platform can receive around 40,000 transactions per second," says Sashi Venkatesan, Director of Product Engineering, Pharmacy and Healthcare Data Product Line at Walgreens. "But with Azure Databricks, we have the flexibility to scale whenever we need."

The process is backed up by key storage and database technologies, including [Azure Data Lake Storage](#) and [Azure SQL Database](#), and the company uses [Azure Cosmos DB](#) to run the microservices that its prescription transactions rely on. Unlike its previous platform where data from prescription dispenses took 48 hours to reach its data warehouse, Walgreens can now respond within minutes.



"Using Azure resources, we've created state-of-the-art data engineering pipelines that help us process data points from prescription transactions and create valuable insights. We can quickly push these insights back to our pharmacists and technicians."

—Sashi Venkatesan, Director of Product Engineering, Pharmacy and Healthcare Data Product Line, Walgreens

Situation:

Walgreens wanted to create a modern, intelligent data platform that could process hundreds of millions of prescription transactions a year and offer pharmacists the insights that they need to better engage with patients.

Solution:

The company worked with Microsoft to build its Information, Data, and Insights platform using Azure Databricks, Azure Synapse Analytics, and other Azure resources. Pharmacists access real-time information through dashboards and data visualizations in Power BI.

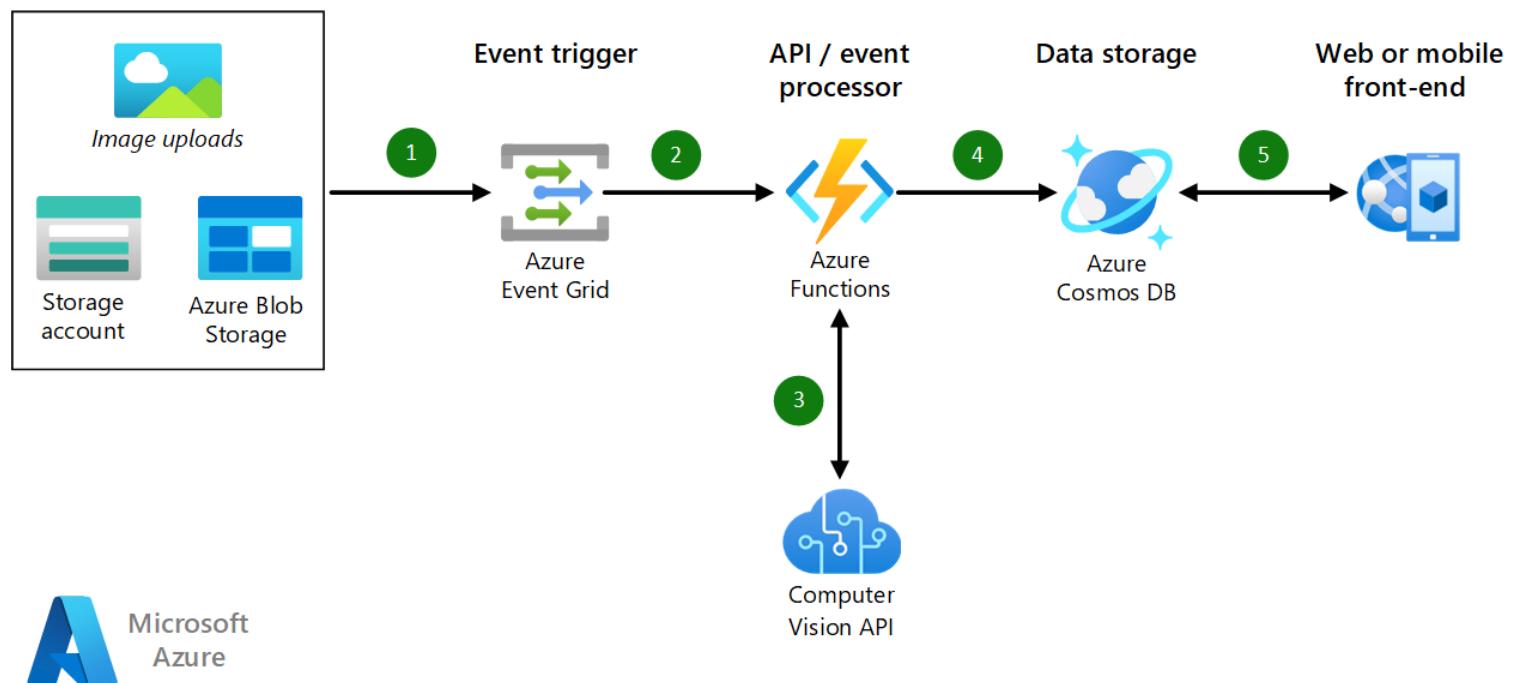
Impact:

Prescription processing now occurs within minutes, compared with 48 hours previously. The company has empowered its pharmacists and technicians with fast, accurate insights for more effective patient engagements.

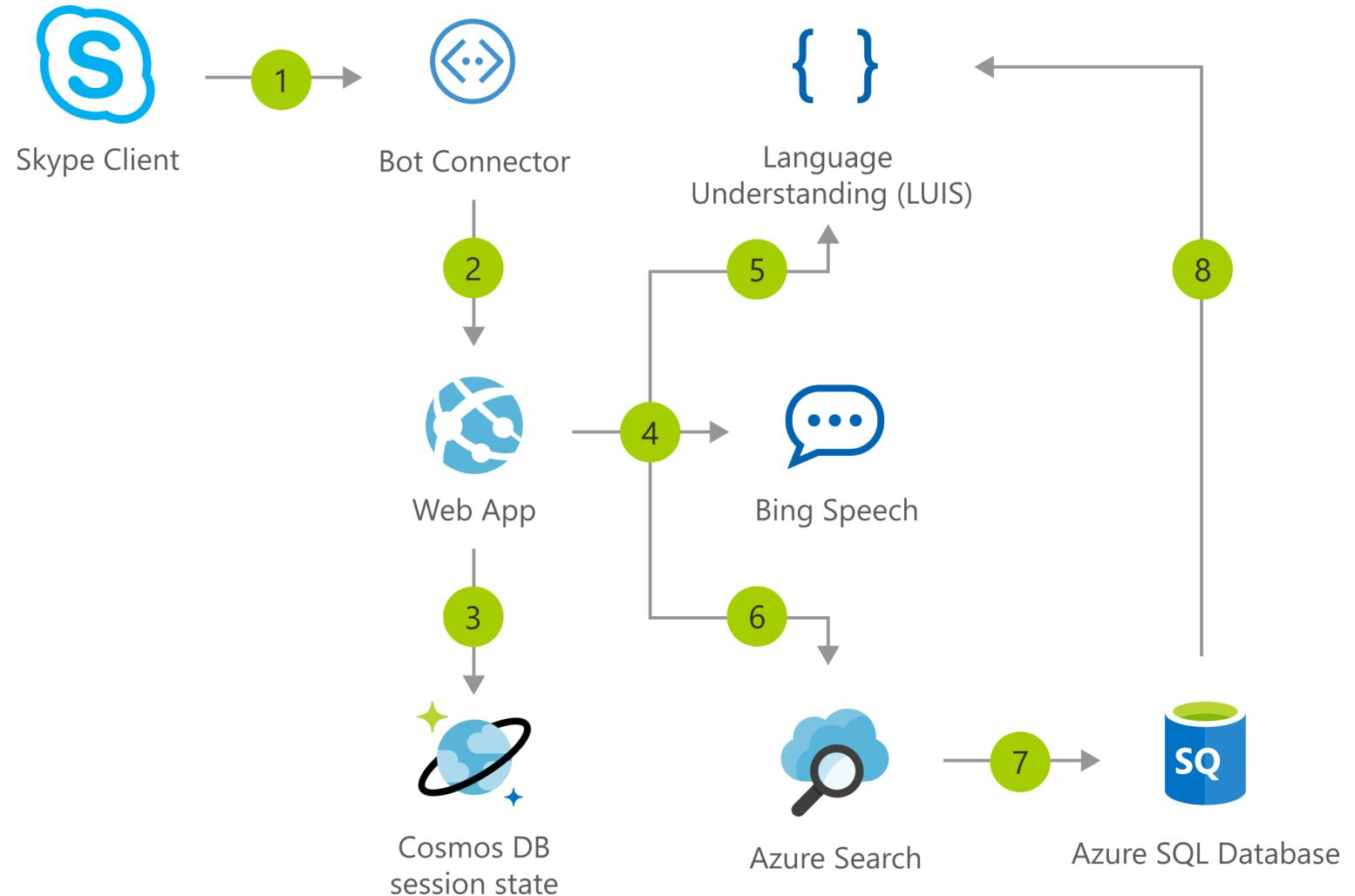
Architecture samples



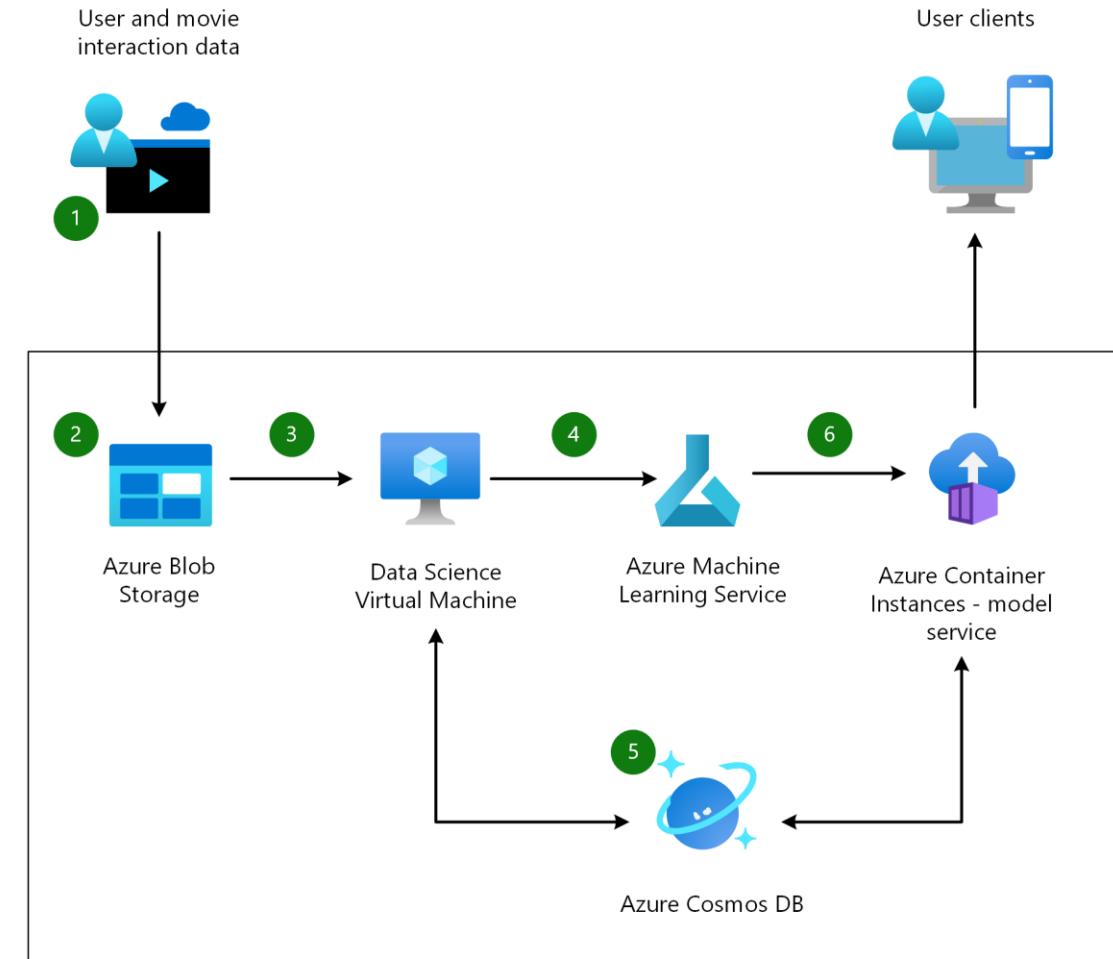
Image classification on Azure



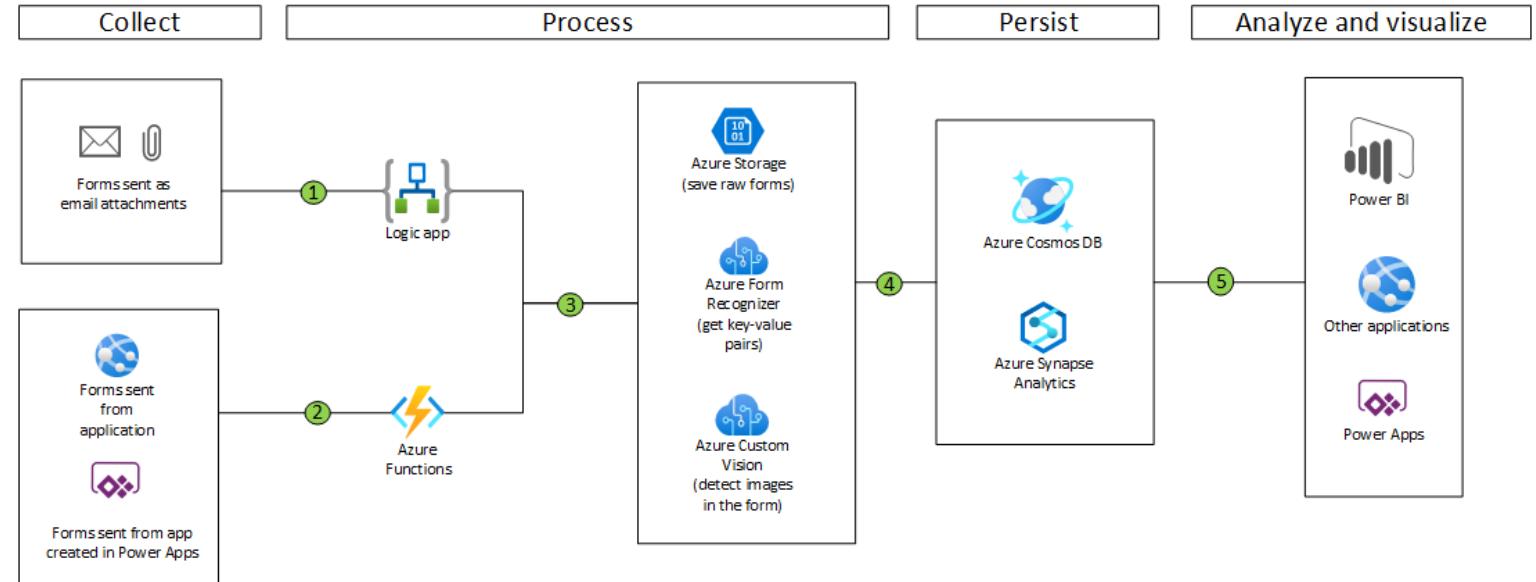
Interactive voice response app with bot



Build a movie recommendation system using machine learning

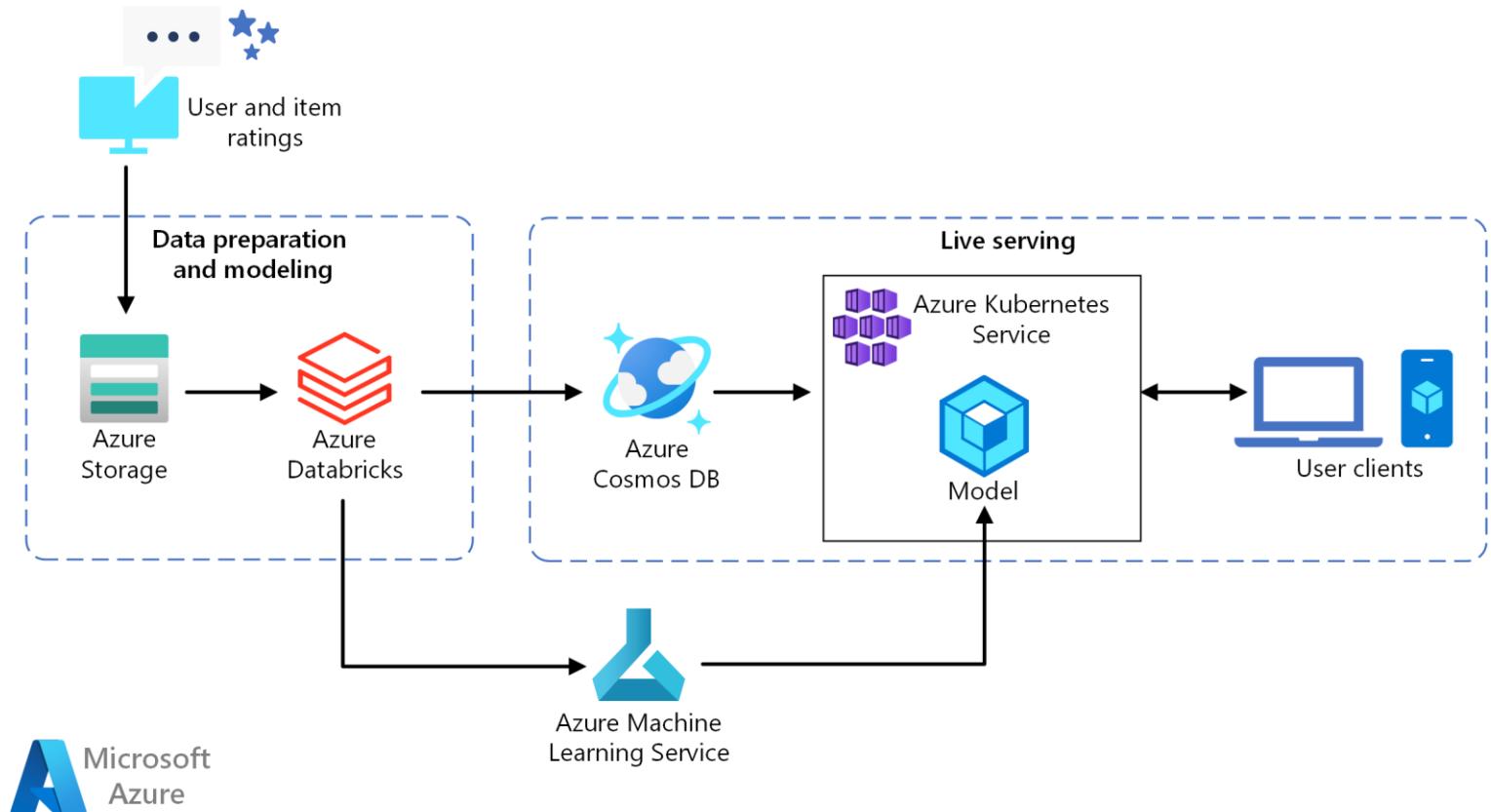


Automate COVID-19 test forms



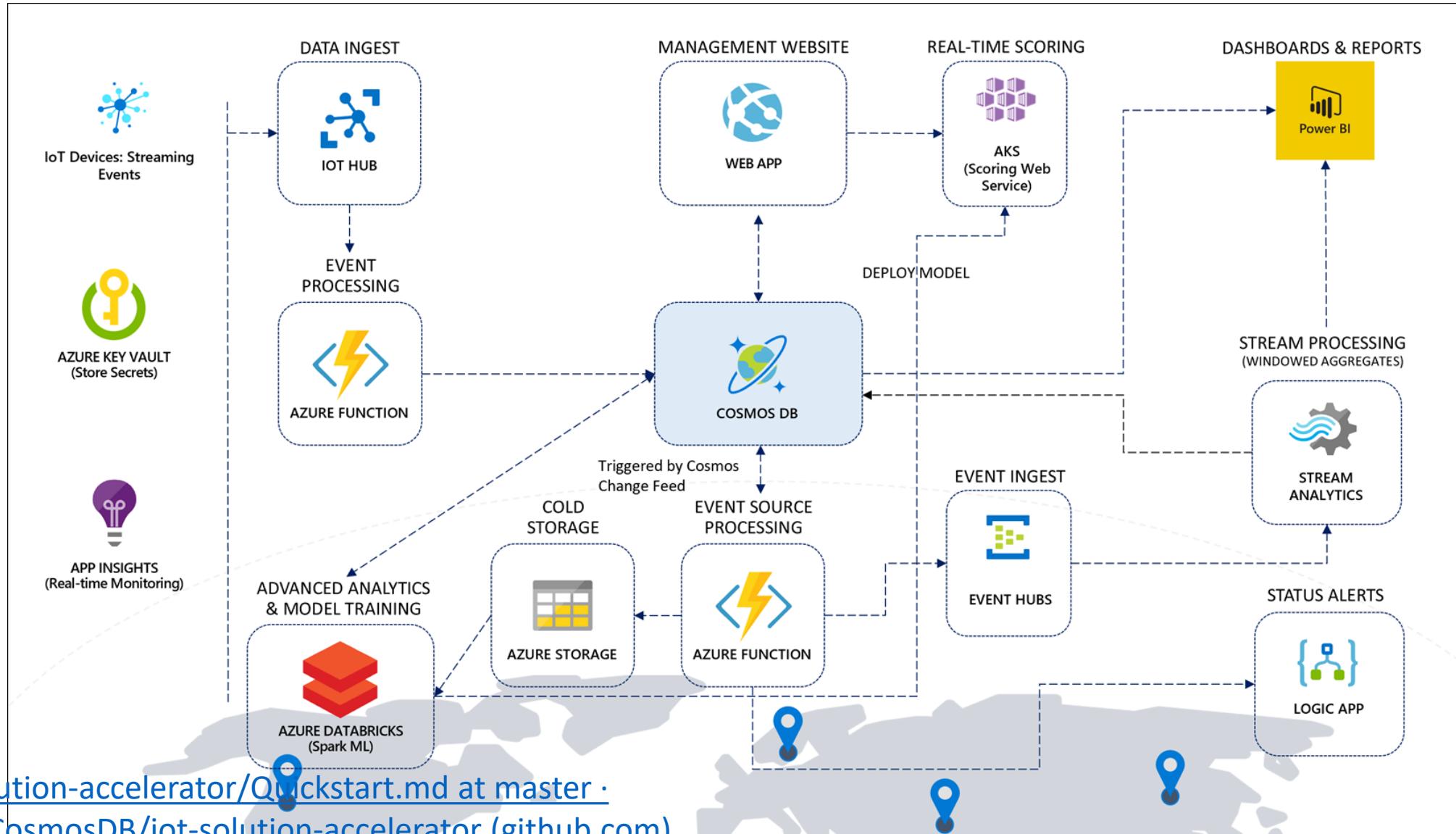
[Automate COVID-19 test forms - Azure Example Scenarios | Microsoft Learn](#)

Build a real-time recommendation API on Azure



[Build a real-time recommendation API on Azure - Azure Architecture Center | Microsoft Learn](#)

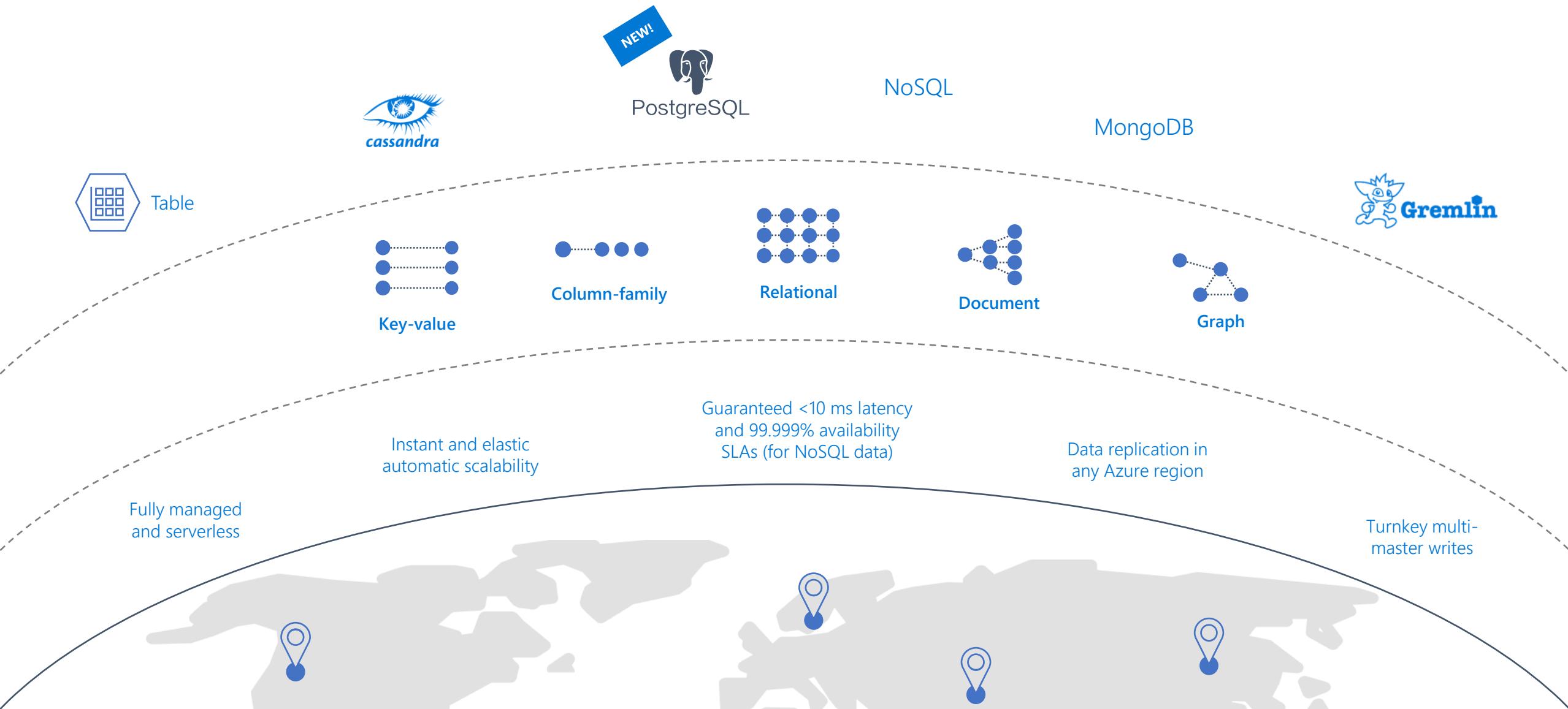
Azure Cosmos DB IoT solution accelerator



Azure cosmosdb Features



Azure Cosmos DB



Cosmos DB uniqueness

Cosmos DB has 6 unique features:



Global Distribution of Data



Serverless Architecture



Multi-Model support



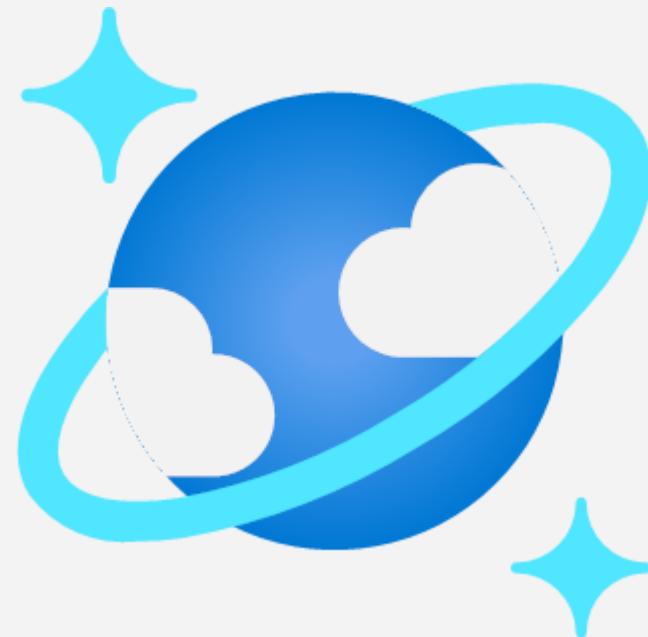
Throughput + Consistency Guarantees



Partitioning and Indexing



Security



Cosmos DB uniqueness

Cosmos DB has 6 unique features:



Global Distribution of Data



Serverless Architecture



Multi-Model support



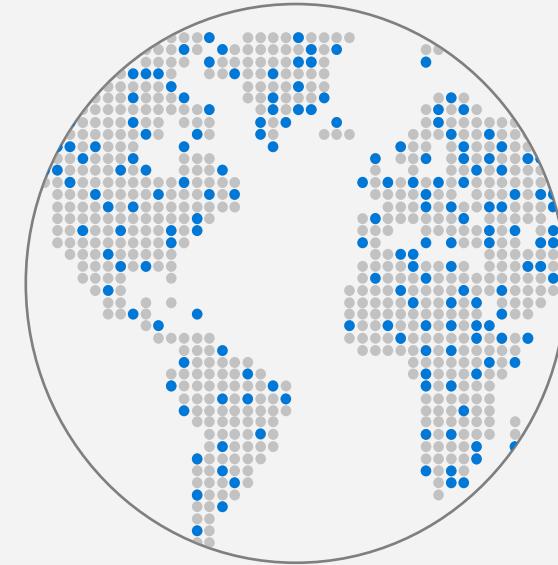
Throughput + Consistency Guarantees



Partitioning and Indexing



Security



- Data distributed all over the planet for low latency
- Automatic data replication to all your regions
- Unlimited scale, both in terms of:
 - storage – via server-side horizontal partitioning,
 - throughput – by provisioning a prescribed number of request units (RUs) per second.
- Different consistency levels for operations to best serve either latency or precision

Cosmos DB uniqueness

Cosmos DB has 6 unique features:



Global Distribution of Data



Serverless Architecture



Multi-Model support



Throughput + Consistency Guarantees

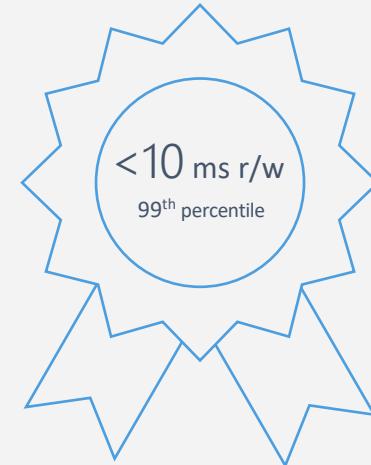


Partitioning and Indexing

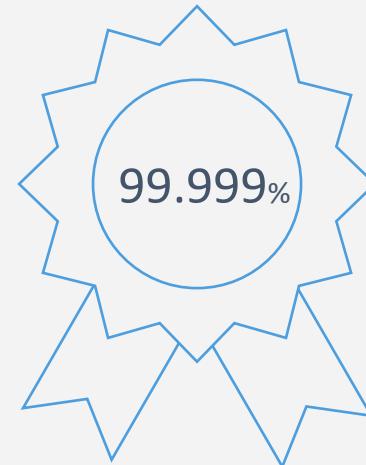


Security

Latency



• High Availability



- Database as a Service – no operational overhead
- Work with endpoints applications use
- Pricing based on resources utilized to operate (Requests Units)
- Smooth integration with other Azure services
- Strong financially-backed SLAs

Cosmos DB uniqueness

Cosmos DB has 6 unique features:



Global Distribution of Data



Serverless Architecture



Multi-Model support



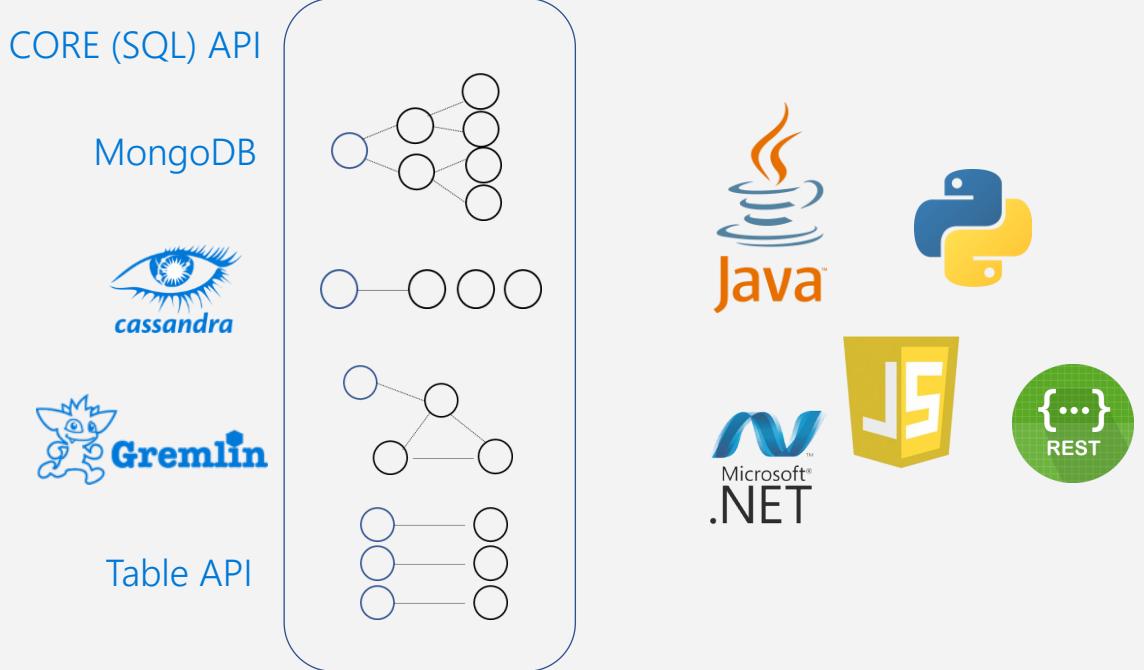
Throughput + Consistency Guarantees



Partitioning and Indexing



Security



- Flexibility to choose the right data model for the job
- Multiple native SDKs to access the database
- Leverage existing knowledge
- Improve TTM

Cosmos DB uniqueness

Cosmos DB has 6 unique features:



Global Distribution of Data



Serverless Architecture



Multi-Model support



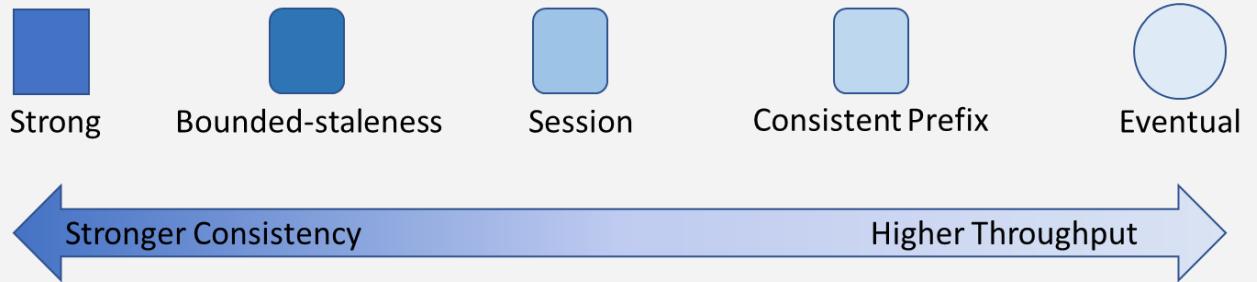
Throughput + Consistency Guarantees



Partitioning and Indexing



Security



- Consistency is tuneable
- 5 different consistency models to meet all business needs
- Throughput is a function of RUs and consistency settings

Cosmos DB uniqueness

Cosmos DB has 6 unique features:



Global Distribution of Data



Serverless Architecture



Multi-Model support



Throughput + Consistency Guarantees

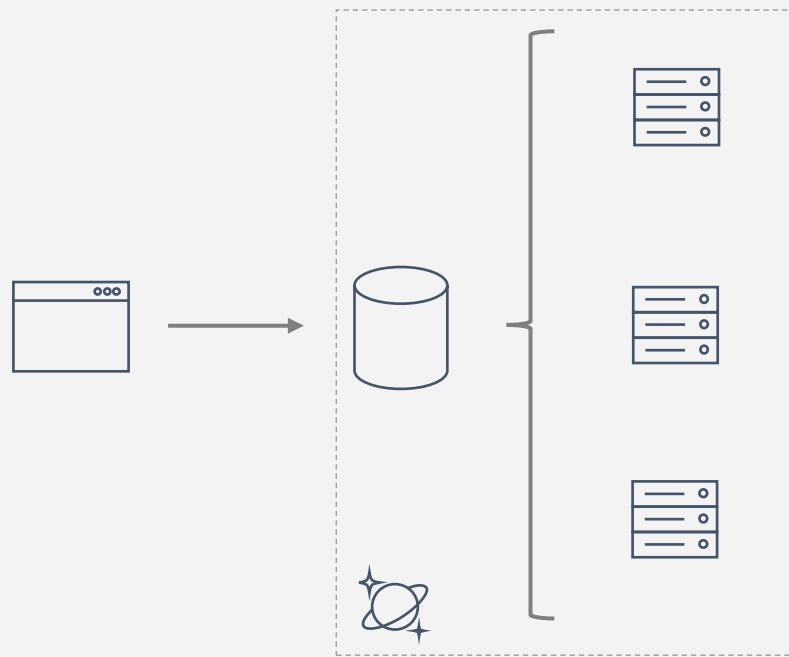


Partitioning and Indexing



Security

- Data is spread across different computers within logical and physical partitions (or buckets)
- Data replication and indexing are automatically handled by Cosmos DB
- Partitioning and indexing are two of the most important design decisions with Cosmos DB



Cosmos DB uniqueness

Cosmos DB has 6 unique features:



Global Distribution of Data



Serverless Architecture



Multi-Model support



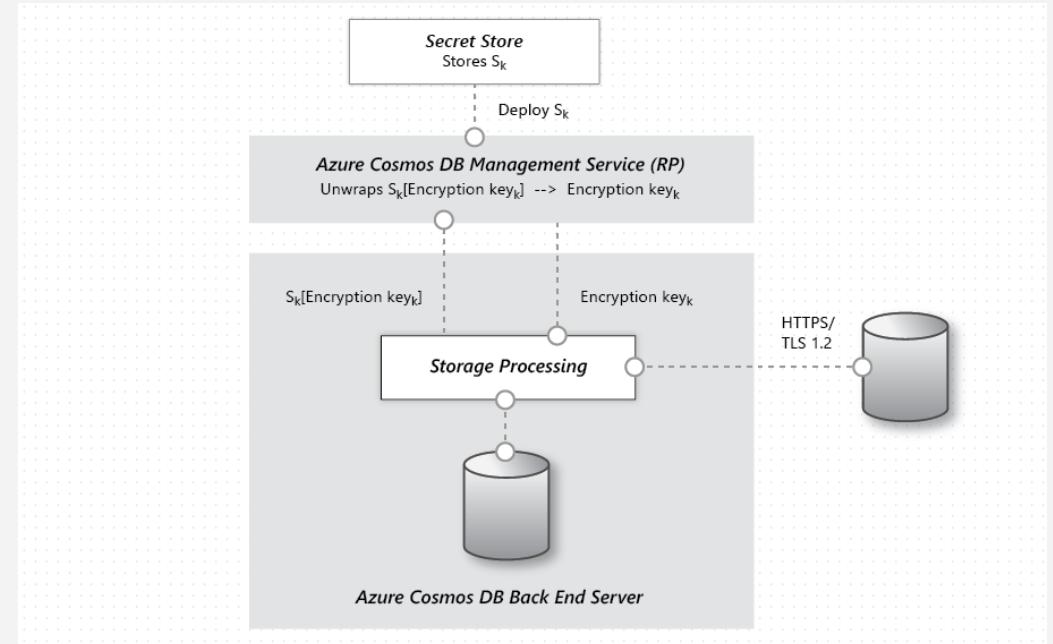
Throughput + Consistency Guarantees



Partitioning and Indexing



Security



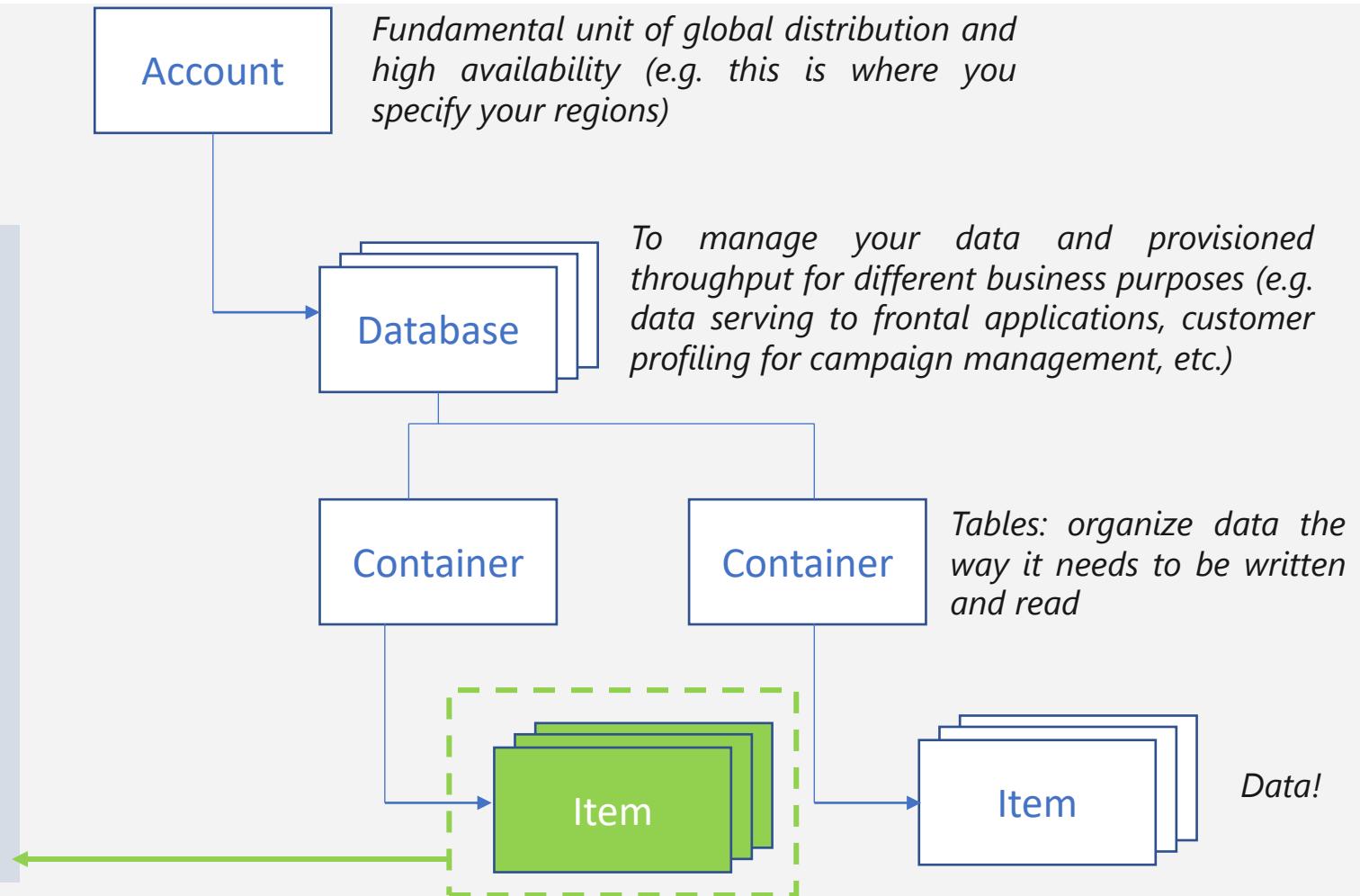
- Data encryption at rest and in transit with no user controls to turn it on or off.
- Https, tls supported.
- Two different types of credentials: master keys and resource tokens.

Azure Cosmos DB

Deeper dive

Resource Model

```
{  
    "id": "1",  
    "firstName": "Thomas",  
    "lastName": "Andersen",  
    "addresses": [  
        {  
            "line1": "100 Some Street",  
            "line2": "Unit 1",  
            "city": "Seattle",  
            "state": "WA",  
            "zip": 98012  
        }  
    ],  
    "contactDetails": [  
        {"email": "thomas@andersen.com"},  
        {"phone": "+1 555 555-5555", "extension": 5555}  
    ],  
    "_rid": <The resource ID >  
    "_self": <unique addressable URI for the resource>  
    "_etag": <optimistic concurrency control to avoid data loss in concurrent writes.>  
    "_ts": <last updated timestamp of the resource>  
}
```



Cosmos DB foundational API

- Core API of the Cosmos DB database engine
- Provides query capabilities rooted in SQL
- Executes server-side logic using a native JavaScript engine
- Although it is called SQL, it is still a document database (NoSQL)

```
{  
  "id": "1",  
  "firstName": "Thomas",  
  "lastName": "Andersen",  
  "addresses": [  
    {  
      "line1": "100 Some Street",  
      "line2": "Unit 1",  
      "city": "Seattle",  
      "state": "WA",  
      "zip": 98012  
    }  
,  
    "contactDetails": [  
      {"email": "thomas@andersen.com"},  
      {"phone": "+1 555 555-5555", "extension": 5555}  
    ]  
}
```

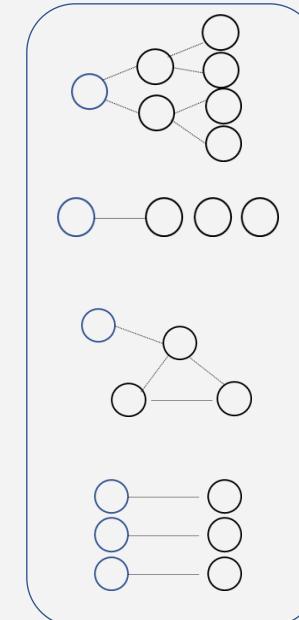
```
SELECT m.addresses.city, m.contactDetails.phone  
FROM members m  
WHERE m.lastname = "Andersen"
```

SQL like query capability

Cosmos DB APIs

APIs that provide a Fully-Managed, NoSQL DB as a Service for some common NoSQL app stacks:

- MongoDB: 3.2, 3.6, 4.0 & 4.2 versions
- Cassandra: CQL v3.11
- Gremlin: Apache Tinkerpop compliant Graph engine
- Table: Premium features of Azure Table Storage



These APIs, allow to:

- **Model real world data using different data models** (documents, key-value, graph, and column-family).
- Let apps **treat Azure Cosmos DB as if it were various other db technologies**, without the overhead of management and scaling approaches.

Multiple Native Core API SDKs

Cosmos DB provides multiple native SDKs to access the database.

- Primary SDKs are **.NET**, **Java**, **Python** and **JavaScript**
- **REST API** allows REST-based querying and interaction
- **Azure Functions** bindings enables rapid development and simplified integration model.

```
@FunctionName("CosmosQuery")
public HttpResponseMessage run(
    @HttpTrigger(name = "req",
        methods = {HttpMethod.GET, HttpMethod.POST},
        authLevel = AuthorizationLevel.ANONYMOUS)
    HttpRequestMessage<Optional<String>> request,
    @CosmosDBInput(name = "itemname",
        databaseName = "ContosoVideo",
        collectionName = "Item",
        id = "{Query.id}",
        partitionKey = "{Query.pk}",
        connectionStringSetting = "ConnectionApplicationSettingName")
    Object item,
    final ExecutionContext context) {
    context.getLogger().info("Retrieved item from the database: " + item);
}
```

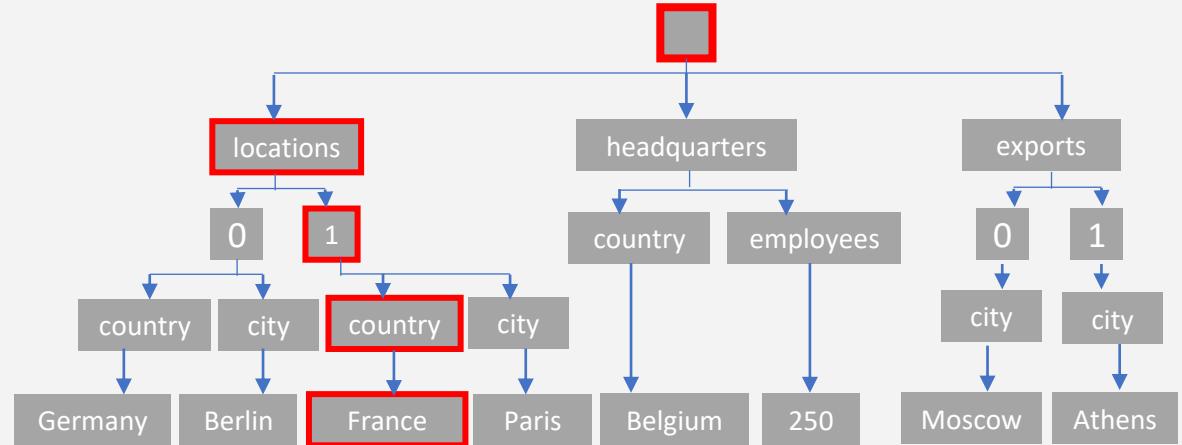


Schemaless Data Model

- Open standard JSON storage model
- Schema-less service automatically indexes all data, regardless of the data model, to provide fast queries.
- No schema: flexibility for changing data.
- Embed data instead of relate.
- Every time a new item is added, it is stored as a JSON document and converted into a tree representation where all its properties are represented.
- The new data is automatically indexed in the tree / auto-indexed by default.

```
{  
  "locations": [  
    { "country": "Germany",  
      "city": "Berlin" },  
    { "country": "France",  
      "city": "Paris" }  
  ],  
  "headquarters": { "country": "Belgium",  
    "employees": 250 },  
  "exports": [  
    { "city": "Moscow" },  
    { "city": "Athens" }  
  ]  
}
```

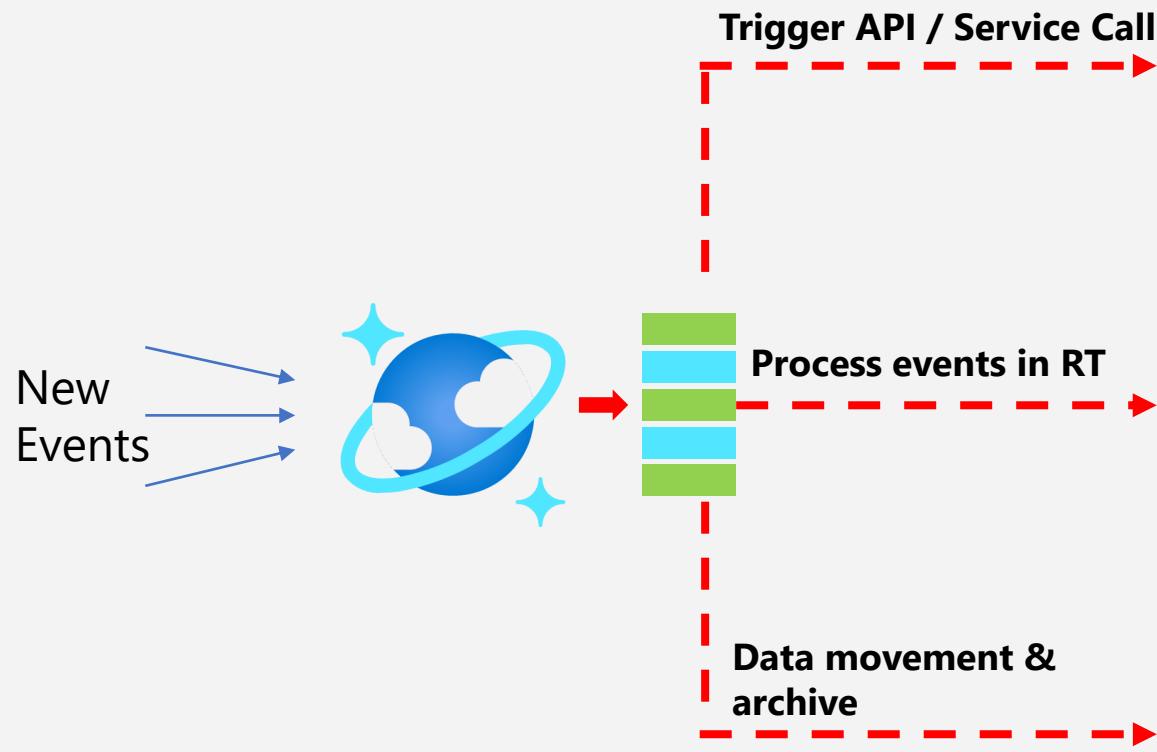
```
SELECT location  
FROM location IN company.locations  
WHERE location.country = "France"
```



Event-based Integration: Change Feed

Change Feed is an API exposed by containers to stream changes (create or update)

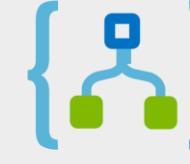
It can be used to react to changes in the DB for an event-driven solution



Event-driven Computing and Automation



OR



OR



AKS

Stream Processing



OR



Azure Stream Analytics

Azure Databricks

Data Movement



OR



OR



Azure Cosmos DB

Azure Data Lake

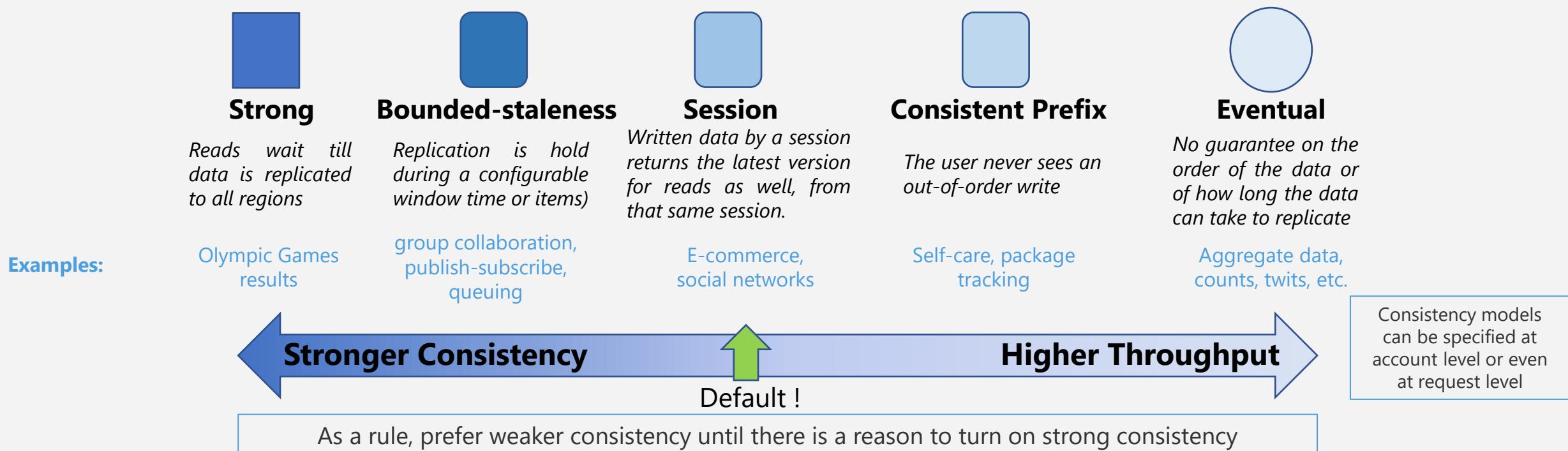
Blob

Consistency models

In Cosmos DB, data is replicated across multiple regions. Writes take time, and the more distance data must travel, the greater the latency.

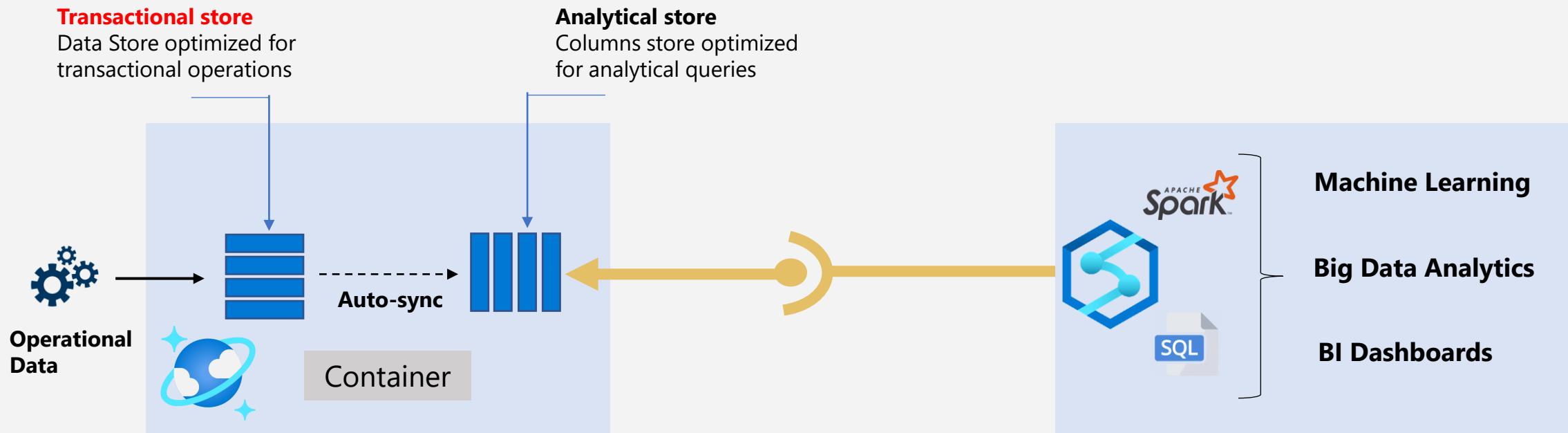
Network latency cannot be avoided (e.g. 100 ms from Europe to US) but choosing the right consistency model for your business requirements helps improve performance:

- 5 consistency models
- Provides control over performance-consistency tradeoffs, backed by comprehensive SLAs



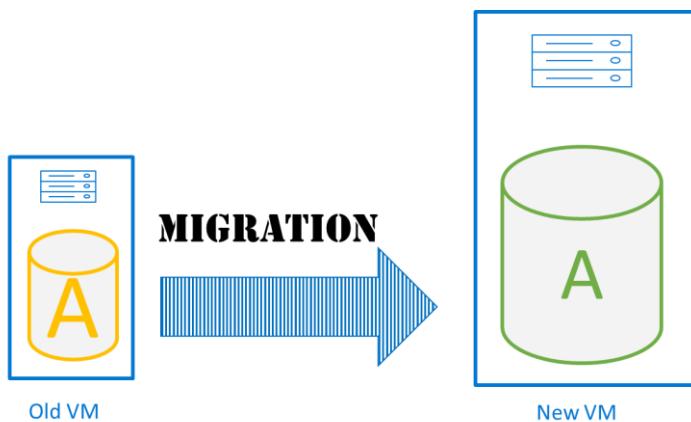
Analytics Processing

Enable real-time analytics over data stored in Cosmos DB without consuming RUs.

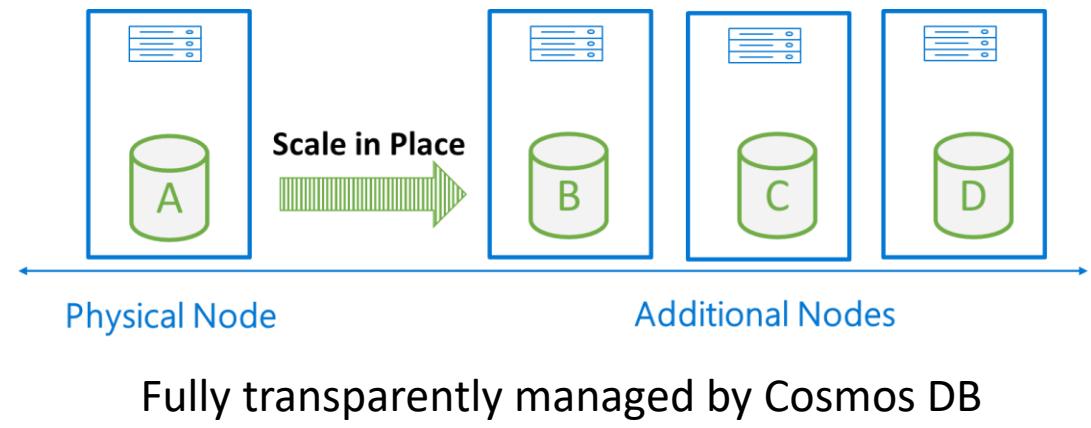


Scaling

Traditional vertical scaling



Cosmos DB always scales horizontally using data partitioning



Choose throughput mode as per workload

Pay only for what you need

Provisioned

- Suits fixed workload requirements



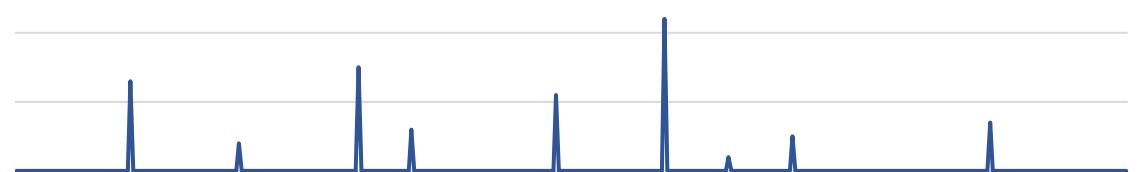
Autoscale

- Suits workloads with flexible needs
- Accommodates sudden growth in usage.
- Granularly scale from 10 to 100s of millions of requests/sec.



Serverless

- Suits spiky workloads
- Pay only for requests you use



Security - overview

Azure Cosmos DB fulfills a large set of security requirements

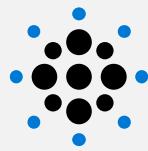
Security Requirement	Cosmos DB approach
Network security	Policy-driven IP-access controls for inbound firewall support. Only machines with the proper IP or within a range can access.
AAA	Authentication based on hash-based message authentication code (primary key or resource token). RBAC settings through IAM in the Azure portal. Azure AD.
Monitor for attacks	Audit logging + Microsoft Defender
Geo-fencing	Ensure data governance for sovereign regions
Protected facilities	Data is stored on SSDs in protected data centers
Encryption	All connections support HTTPS, SSL, TLS 1.2. Data is encrypted at rest and in-transit. Data is encrypted and decrypted on the fly with service-managed keys without affecting performance or availability (also own customer-managed keys can be used.)
Auditability	Advanced auditability possibilities



Powering global solutions

Azure Cosmos DB was built to support modern app patterns and use cases.

It enables industry-leading organizations to unlock the value of data and respond to global customers and changing business dynamics in real-time.



Data distributed and available globally

Puts data where your users are



Build real-time customer experiences

Enable latency-sensitive personalization, bidding, and fraud detection.



Ideal for gaming, IoT & eCommerce

Predictable and fast service, even during traffic spikes



Simplified development with serverless architecture

Fully-managed event-driven micro-services with elastic computing power



Run Spark analytics over operational data

Accelerate insights from fast, global data



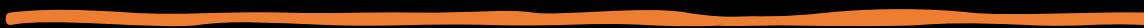
Lift and shift NoSQL data

Lift and shift MongoDB workloads while continuing to leverage existing drivers

Demo



Azure Artificial intelligence services



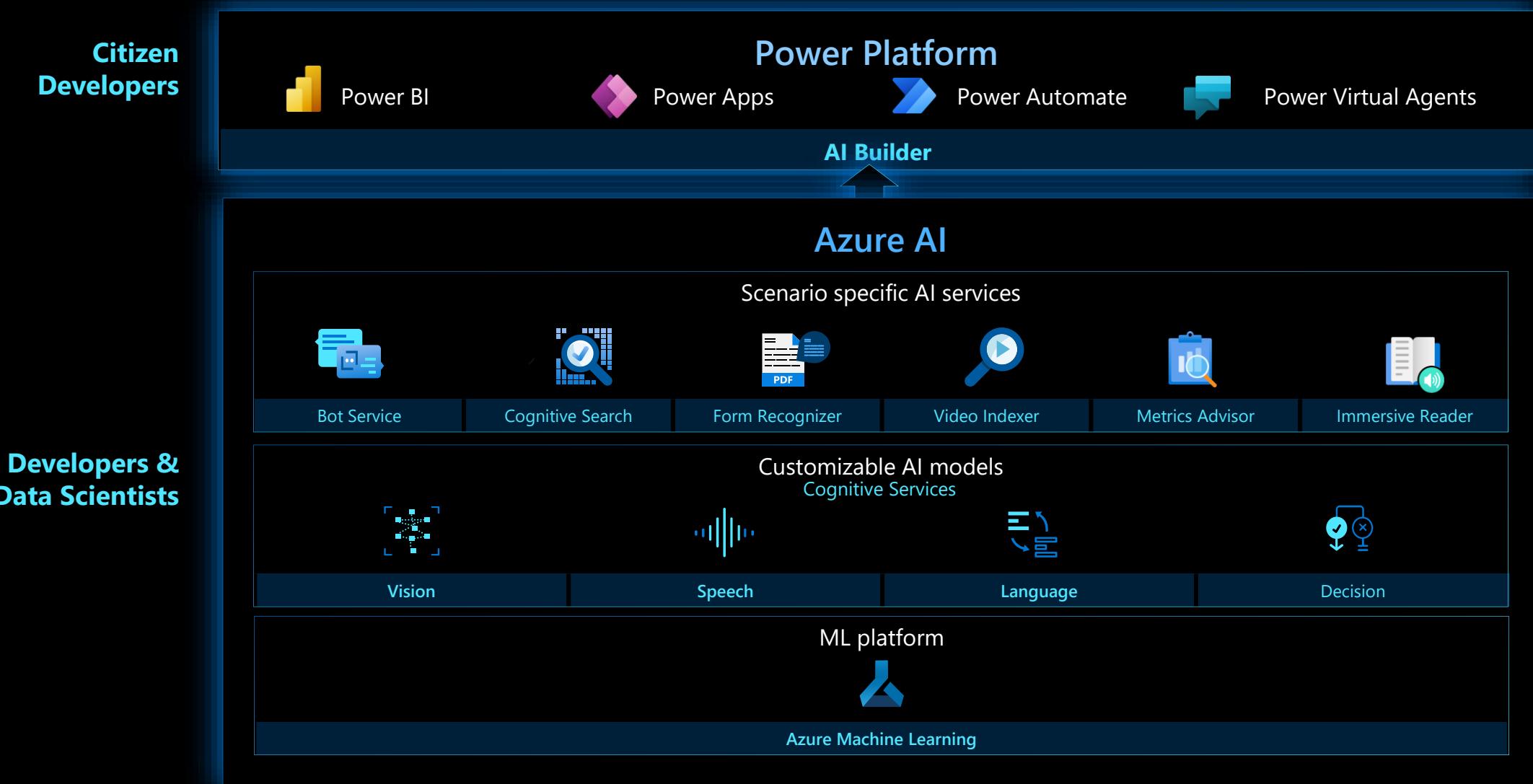
What is Artificial Intelligence ?

Software that imitates human capabilities

- Make decision based on data and past experience
- Recognizing abnormal events
- Interpreting visual input
- Understanding written and spoken language
- Engaging in dialog and conversations



AI Portfolio Overview



A leader in the industry...



"Its [Microsoft's] cloud AI developer services are among the most comprehensive on the market and are all highly competitive."

Gartner Magic Quadrant
Cloud AI Developer Services,
February 2020

[Artificial Intelligence Solutions & Services – Microsoft AI](#)

...transforming organizations worldwide

Reduce time and costs

Automate processes

Improve customer support



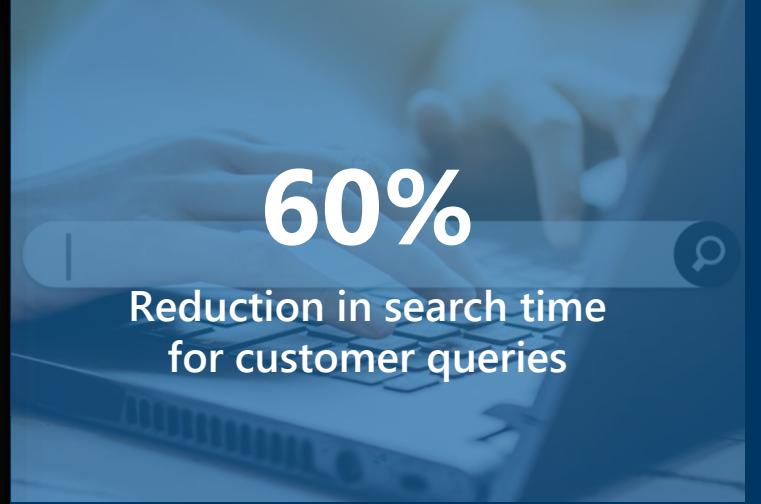
80%

Cost reduction by
streamlining transcription



54M

Prescriptions per month
automatically processed

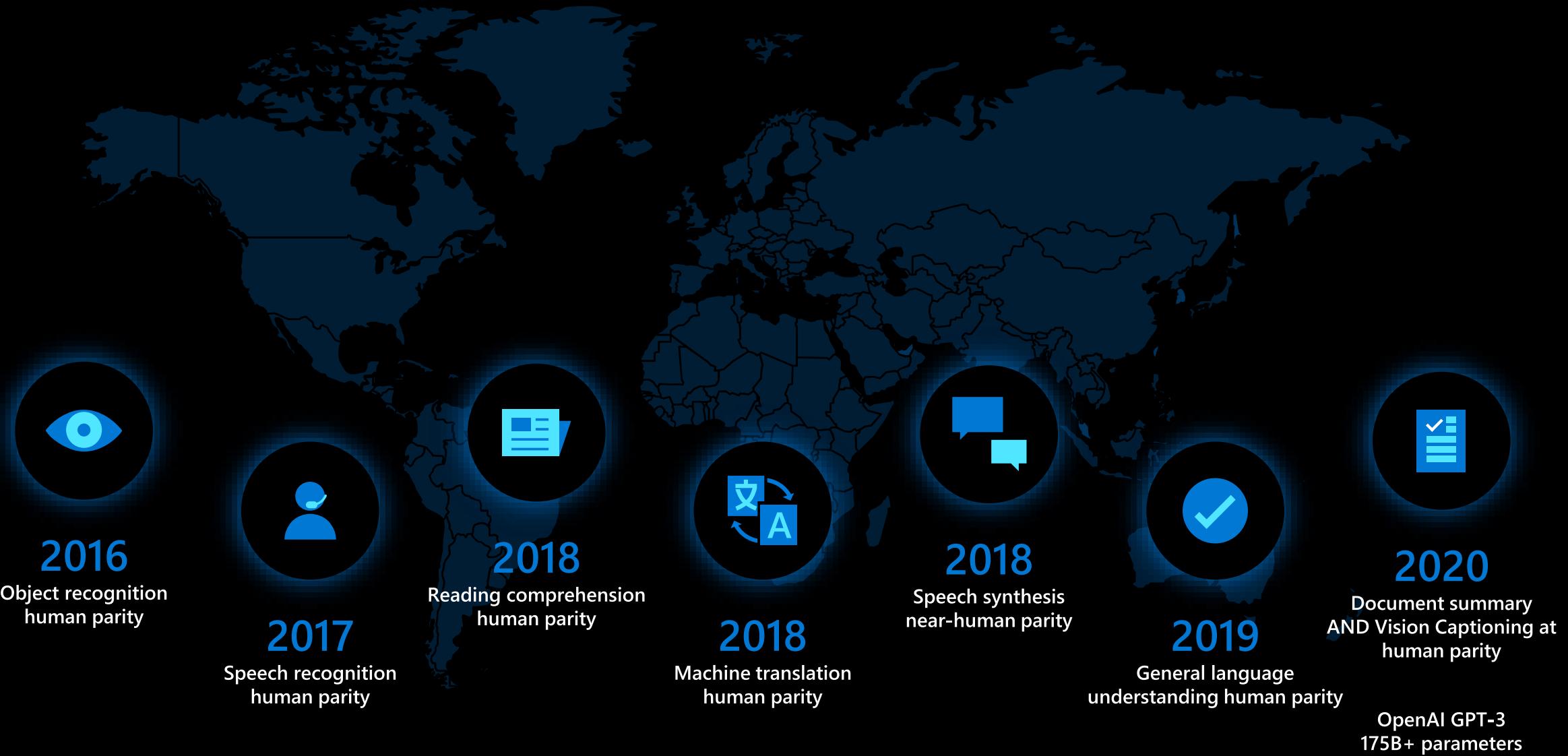


60%

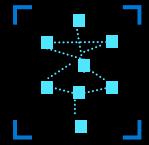
Reduction in search time
for customer queries



Breakthrough AI grounded in world-class research



Azure Cognitive Services



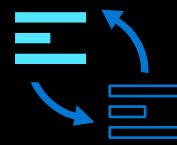
Vision

- Computer Vision
- Custom Vision
- Face
- Form Recognizer
- Video Indexer



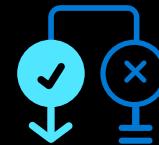
Speech

- Speaker Recognition
- Speech



Language

- Immersive Reader
- Language Understanding
- Text Analytics
- Text and document Translation
- QnA Maker



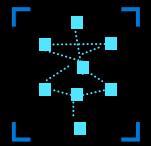
Decision

- Anomaly Detector
- Content Moderator
- Personalizer



Customizable

Most comprehensive set of AI capabilities



Vision

Image understanding

Text extraction

Image captioning

Form recognition

Video indexing

Facial recognition

Spatial analysis



Speech

Speaker recognition

Speech to text

Text to speech

Custom neural voices

Speech translation



Language

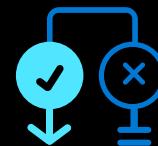
Entity extraction

Sentiment analysis

Intent understanding

Text and document translation

Q & A creation



Decision

Anomaly detection

Root-cause analysis

Metric monitoring

Personalization

Challenges and Risks with AI

Challenge or Risk	Example
Bias can affect results	A loan-approval model discriminates by gender due to bias in the data with which it was trained
Errors may cause harm	An autonomous vehicle experiences a system failure and causes a collision
Data could be exposed	A medical diagnostic bot is trained using sensitive patient data, which is stored insecurely
Solutions may not work for everyone	A predictive app provides no audio output for visually impaired users
Users must trust a complex system	An AI-based financial tool makes investment recommendations - what are they based on?
Who's liable for AI-driven decisions?	An innocent person is convicted of a crime based on evidence from facial recognition – who's responsible?

Develop AI products responsibly

Microsoft improves facial recognition technology to perform well across all skin tones, genders

June 26, 2018 | John Roach

[in](#) [tw](#) [f](#) [re](#) [g](#)



Responsible AI principles

- Fairness
- Reliability & Safety
- Privacy & Security
- Inclusiveness
- Transparency
- Accountability

[Responsible AI principles from Microsoft](#)

Co-Designing Checklists to Understand Organizational Challenges and Opportunities around Fairness in AI

Michael Madan, Luke Stark, Jennifer Wotman Vaughan, Hanna Wallach
CHI Conference on Human Factors in Computing Systems | March 2020
Organized by ACM
CHI 2020 Best Paper Award

[Download BibTeX](#)

[Download PDF](#)

Groups

FATE: Fairness, Accountability, Transparency, and Ethics in AI
FATE | Montreal

Solving the challenge of securing AI and machine learning systems

Dec 6, 2019 | Valecia Maclin - General Manager, Engineering - Customer Security & Trust

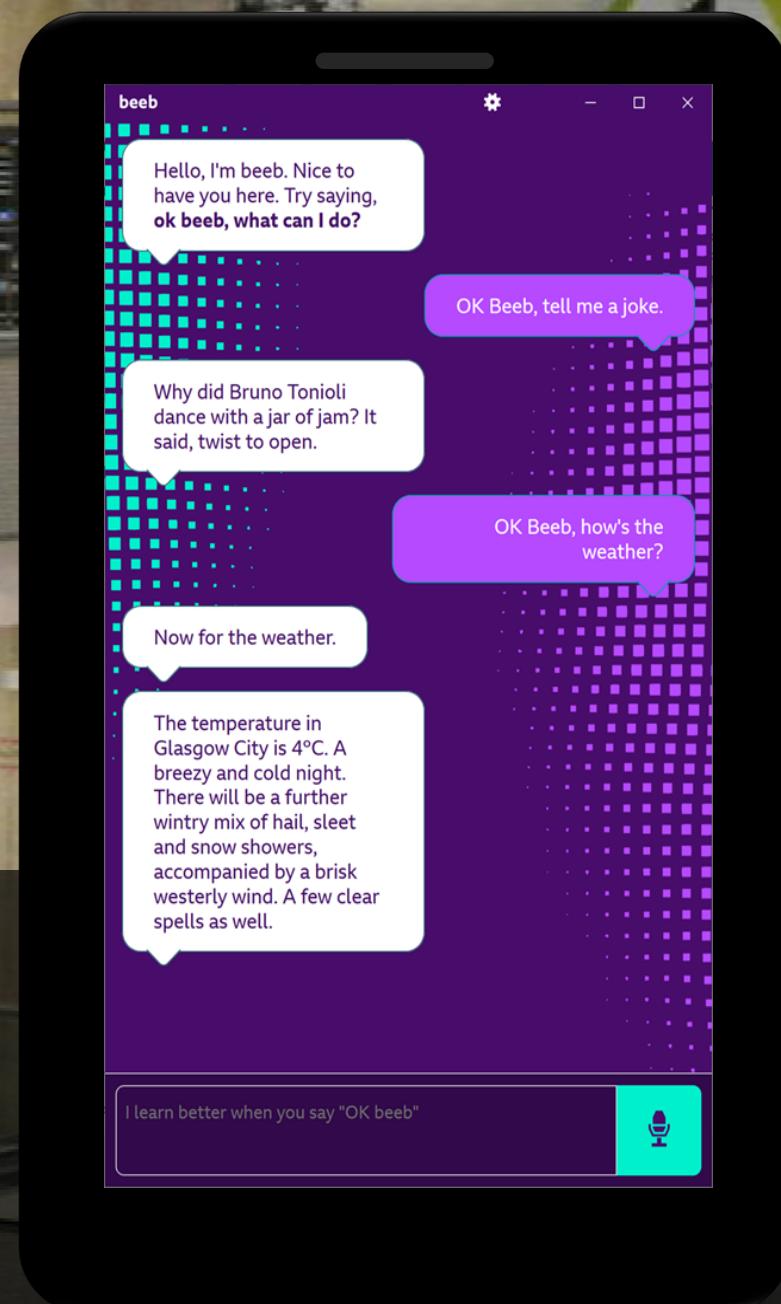


Today, in collaboration with Harvard University's [Berkman Klein Center](#), we at Microsoft are publishing a series of materials we believe will contribute to solving a major challenge to securing artificial intelligence and machine learning systems. In short, there is no common terminology today to discuss security threats to these systems and methods to mitigate them, and we hope these new materials will provide baseline language that will enable the research community to better collaborate.



Responsible

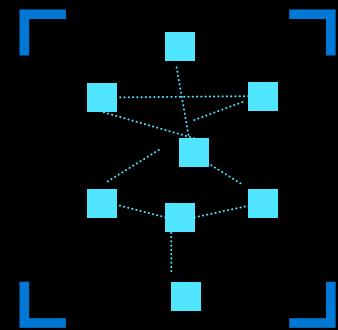
Bringing content to life with a customized voice assistant
that can understand a broad range of accents





Cognitive Services in Action

Vision



What is Computer Vision?

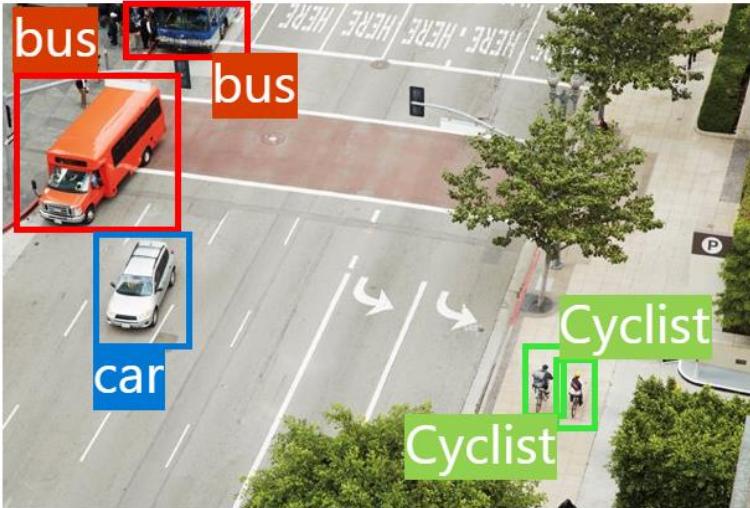


Applications of Computer Vision

Image Classification



Object Detection



Semantic Segmentation



Image Analysis



Face Detection & Recognition

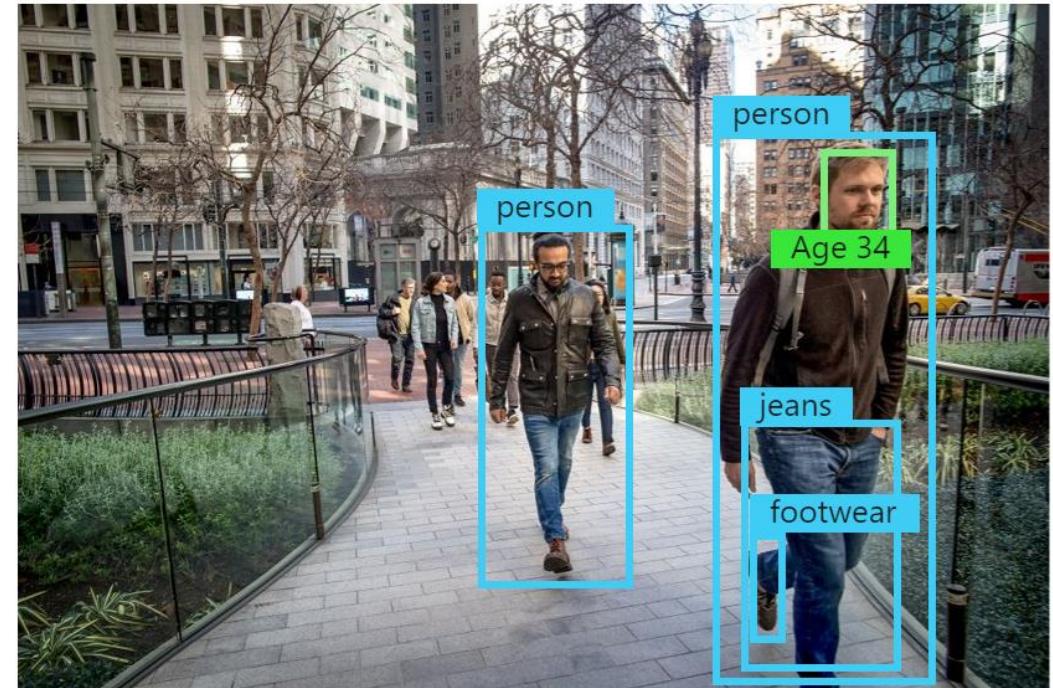


Optical Character Recognition



Image Analysis with the *Computer Vision Service*

- Pre-trained computer vision model
- Object detection for over 10,000 predefined classes
- Image description and tag generation
- Face detection and analysis
- Content moderation
- Text detection and OCR



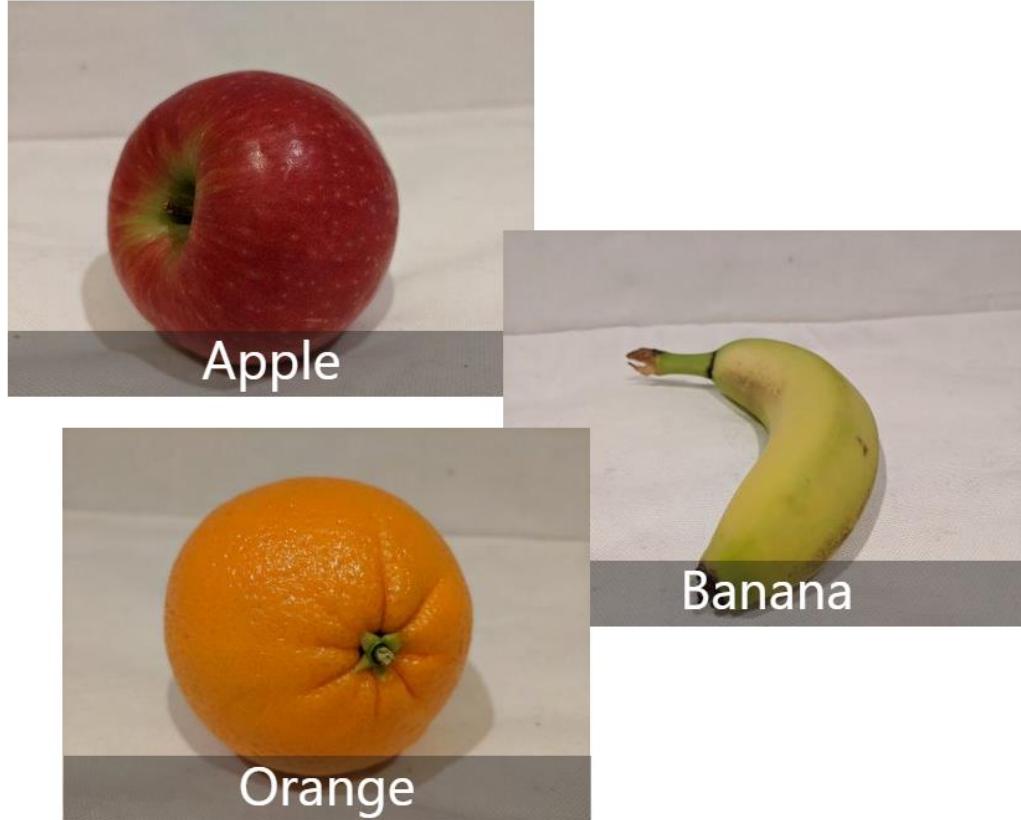
Caption: a group of people walking on a sidewalk

Tags: building, jeans, street, outdoor, jacket, city, person

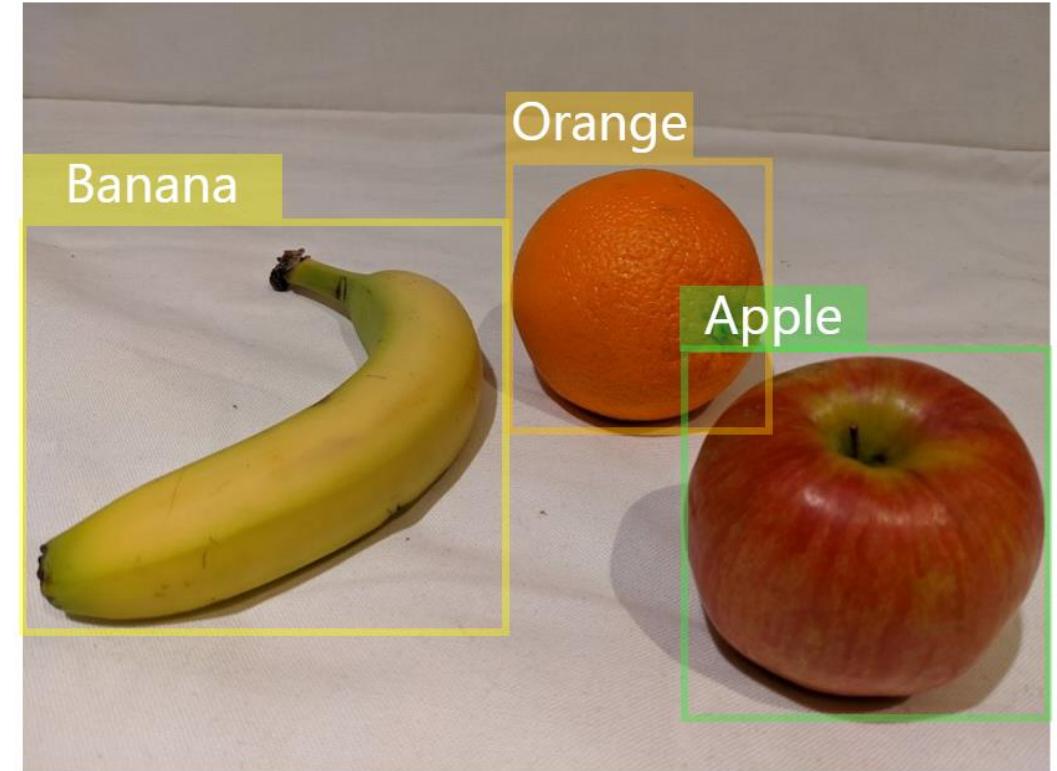
Ratings: Adult: False, Racy: False, Gore: False

Training Models with the *Custom Vision Service*

Image Classification

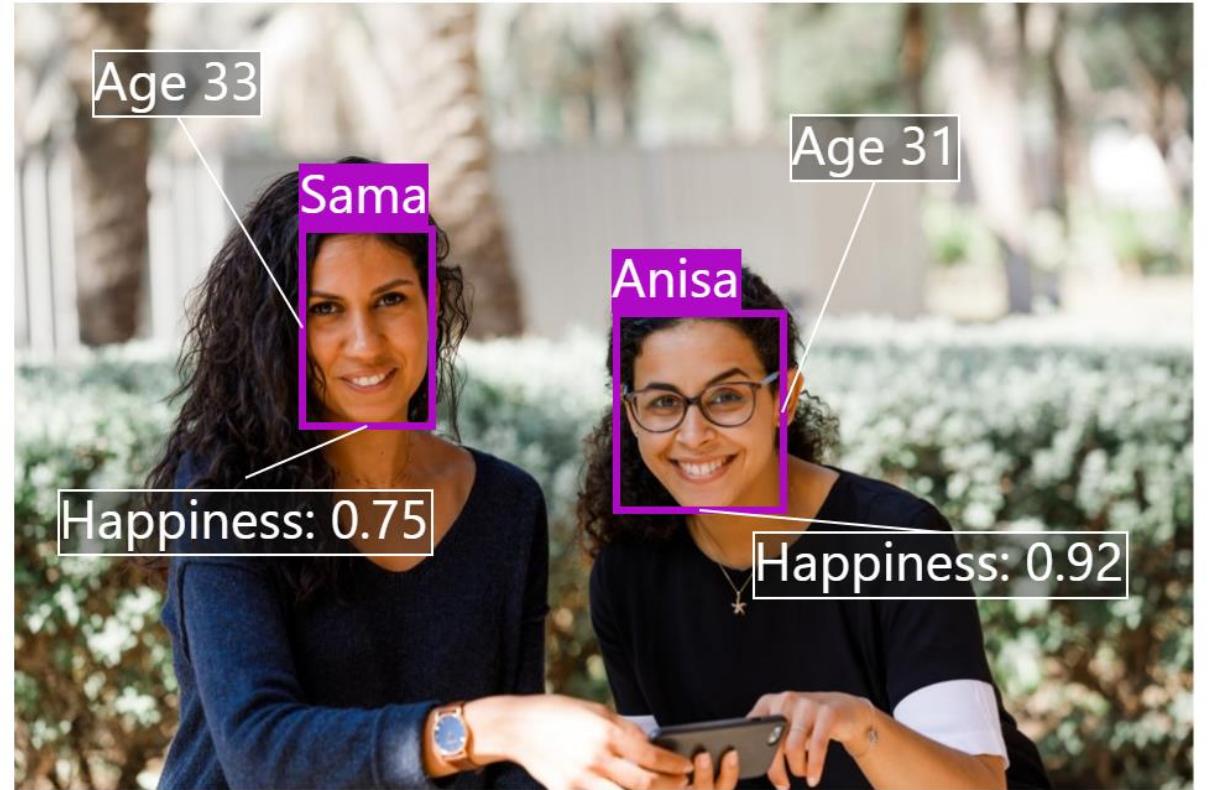


Object Detection



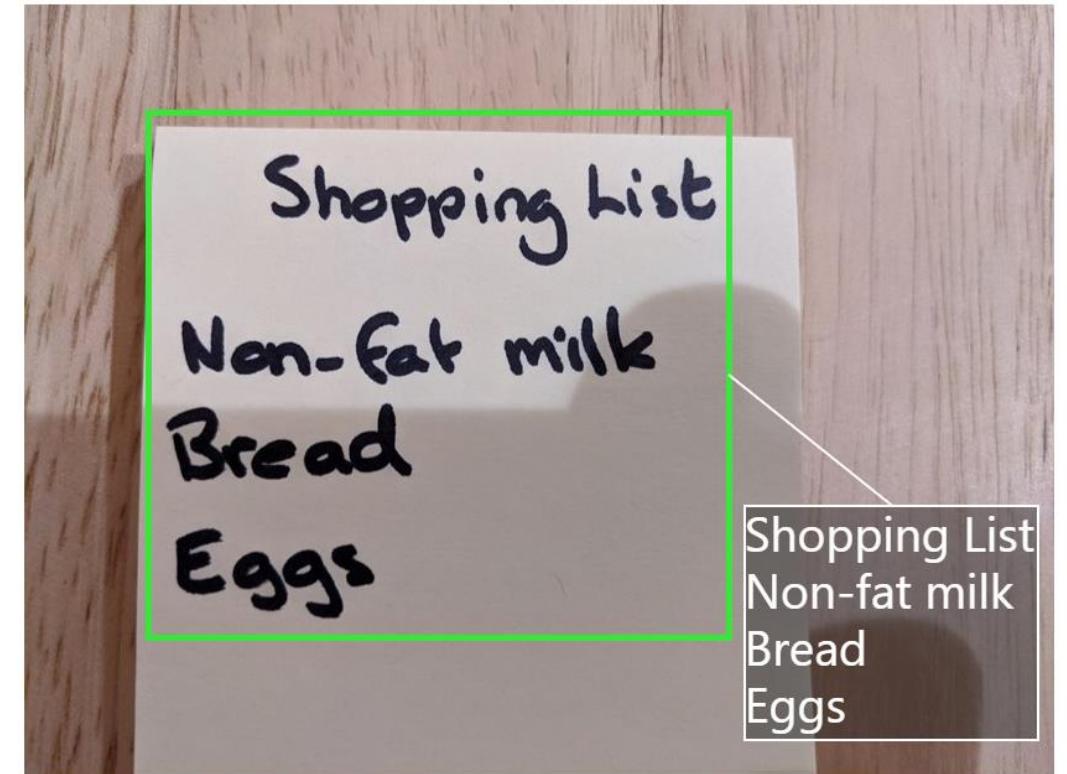
Analyzing Faces with the *Face Service*

- More facial analysis functionality than the *Computer Vision* service, including:
 - Facial attributes:
 - Age
 - Emotions
 - Facial recognition:
 - Similarity matching
 - Identity verification



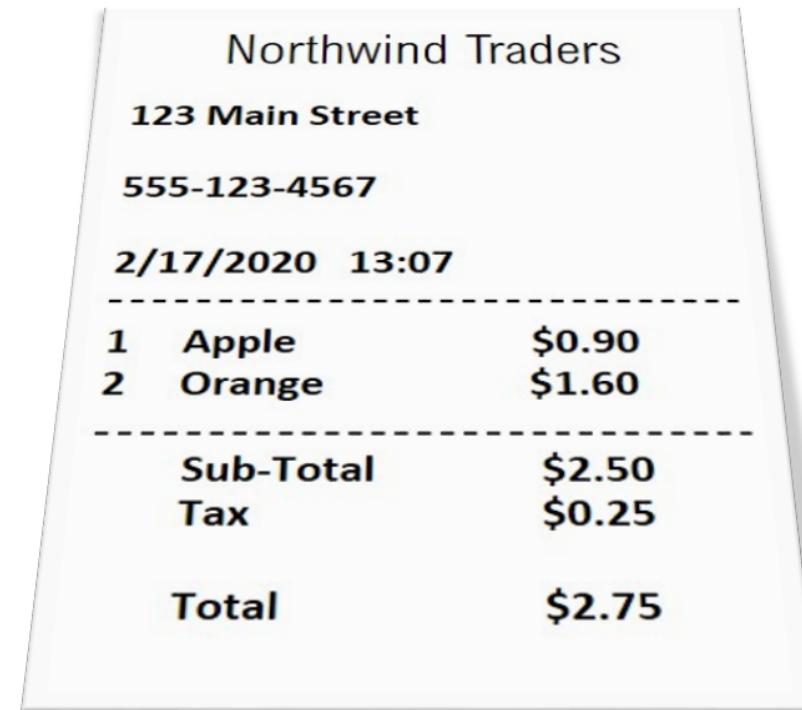
Reading Text with the *Computer Vision Service*

- Detect the location of text:
 - Printed
 - Handwritten
- Options for quick text extraction from images, or asynchronous analysis of larger scanned documents



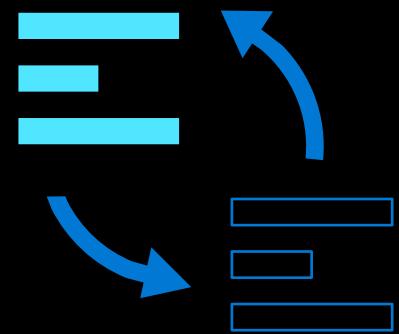
Analyzing Forms with the *Form Recognizer* Service

- Extract information from scanned forms in image or PDF format
 - Train a custom model using your own forms
 - Use the pre-trained receipt model
- Models perform semantic recognition of form fields – not just text extraction

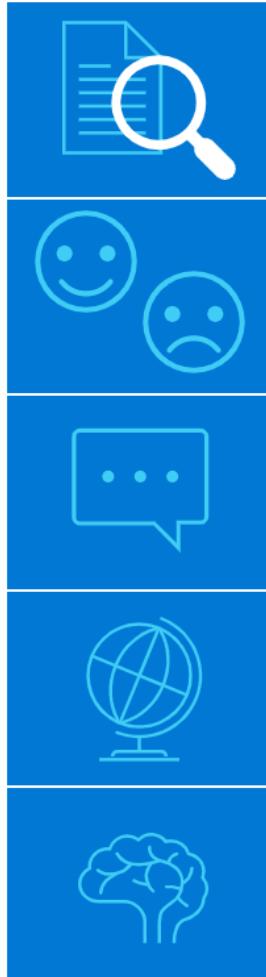




Language



What is Natural Language Processing?



Text analysis and entity recognition

Sentiment analysis

Speech recognition and synthesis

Machine translation

Semantic language modeling

Natural Language Processing in Azure



Cognitive Services

Text Analytics

- Language detection
- Key phrase extraction
- Entity detection
- Sentiment analysis

Speech

- Text to speech
- Speech to text
- Speech translation

Translator Text

- Text translation

Language Understanding

- Custom language modeling

Text Analytics

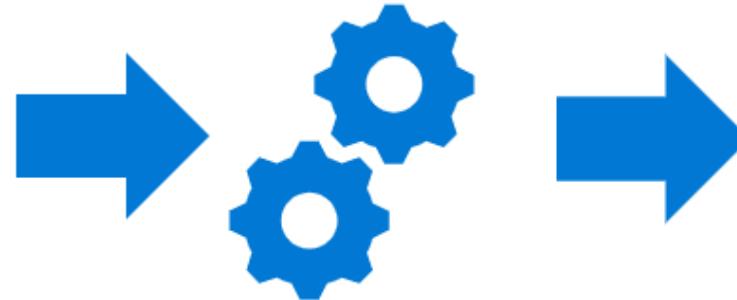
I had a wonderful vacation in France.

- **Predominant Language:** English
- **Sentiment:** 88% (positive)
- **Key Phrases:** "wonderful vacation"
- **Entities:** France

Translation

Translator Text service

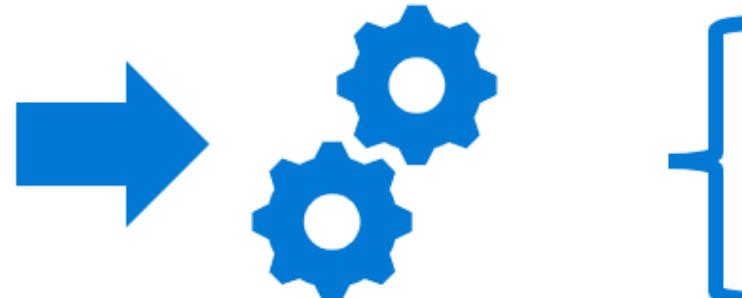
Bonjour



Hello

Speech service

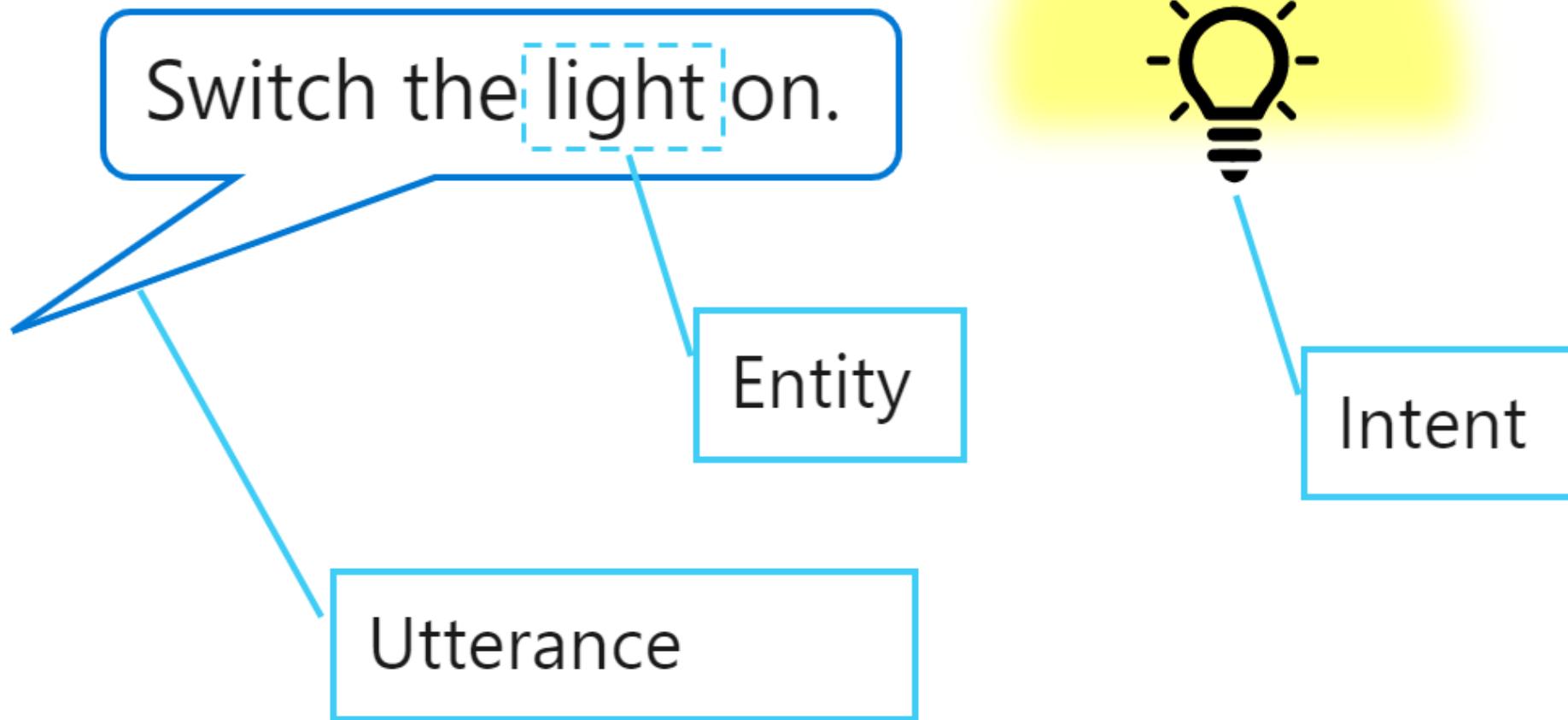
Hello



Hola

你好

Language Understanding

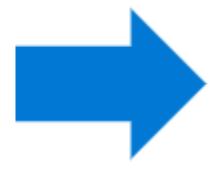




Speech



Speech Recognition and Synthesis

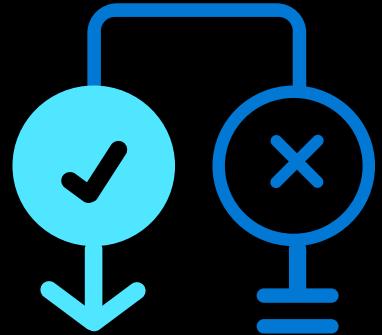


Use the *speech-to-text* capabilities of the **Speech** service to transcribe audible speech to text

Use the *text-to-speech* capabilities of the **Speech** service to generate audible speech from text



Decision



Make smarter decisions faster

Anomaly Detector

- Identify potential problems early on.

Content Moderator

- Detect potentially offensive or unwanted content.

Personalizer

- Create rich, personalized experiences for every user.

Open AI



What is OpenAI?



- OpenAI is an AI research and deployment company.
- Their mission is to ensure that artificial general intelligence (AGI) benefits humanity.

Who is
OpenAI?

Startup

Research
Lab

Safety and
Policy

Commercial
Service

In Beta

OpenAI API Beta

GPT-3 Model APIs



OpenAI Codex

AI system that translates natural language into code

Core
Research

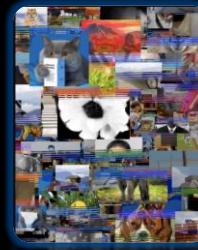


Image GPT
Image completion



Jukebox Music
generation



DALL-E Images
from text



Robots



CLIP Connecting
images & text



Azure Applied AI Services

What are Azure Applied AI Services?

Azure Applied AI Services are high-level services focused on empowering developers to *quickly unlock the value of data* by applying AI into their key business scenarios.

Built on top of the AI APIs of Azure Cognitive Services, Azure Applied AI Services are optimized for critical tasks ranging from

- monitoring and diagnosing metric anomalies,
- mining knowledge from documents,
- enhancing the customer experience through transcription analysis,
- boosting literacy in the classroom,
- document understanding and more.

Previously, companies would have to orchestrate multiple AI skills, add business logic, and create a UI to go from development to deployment for their scenario – all of which would consume time, expertise, and resources – these “scenario specific” services provide developers these benefits “out of the box”.

Azure Applied AI Services

Form
Recognizer

Metrics
Advisor

Cognitive
Search

Immersive
Reader

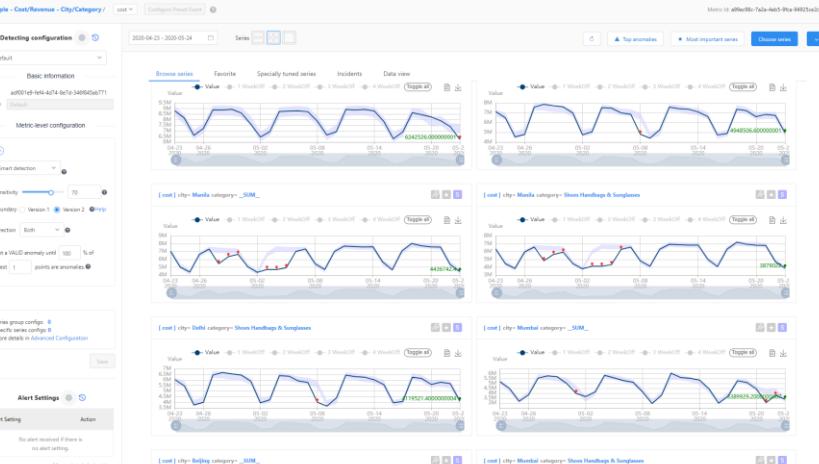
Bot
Service

Video
Analyser



Azure Media Services | Video Indexer

18 People: Sanya Nadella, Microsoft CEO
17 Keywords: geography, landforms, mountains, valleys, glaciers, rivers, landforms, sometimes, called, physical, important, students, know, about, physical
Emotions: 4.3% Joy, 1.7% Sadness
Topics: Geography, Landforms, Mountains, Valleys, Glaciers, Rivers, Landforms, Sometimes, Called, Physical, Important, Students, Know, About, Physical



The study of Earth's land-forms is called physical geography. Land-forms can be mountains and valleys. They can also be glaciers or rivers. Land-forms are sometimes called physical features. It is important for students to know about the physical

Geography

Contoso

Vision

Language

Speech

...and more

Language: US English

People: Adele Vance, Megan Bowen

Organization(s): Fabrikam, Inc., Northwind Traders

Location(s): Redmond, WA, other location

Images: Bolt, steel, logos, text...

Key Phrase(s): Metal, industrial, steel...

Power Virtual Agents | Bot

Test bot

Get user's name

Flow inputs (1): `userToken` gets value from `AuthToken (hard)`

Get user name and location

Flow outputs (2) give value to `displayName (text)`, `officeLocation (text)`

Select options for user

Ask a question: What would you like to do next?

Identify

Multiple choice options

Select options for user

New option

Save response as User choice (hard)

Message: My name is `displayName`