

THE NEXT REVOLUTION

The Democratization of Artificial Intelligence

AI for Small to Mid-Size Businesses

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President

TwinEngines



MANUFACTURING[™]
TECHNOLOGY SERIES



What is artificial intelligence?

*AI is the capability of a machine to imitate intelligent human behavior through **pattern recognition**:*

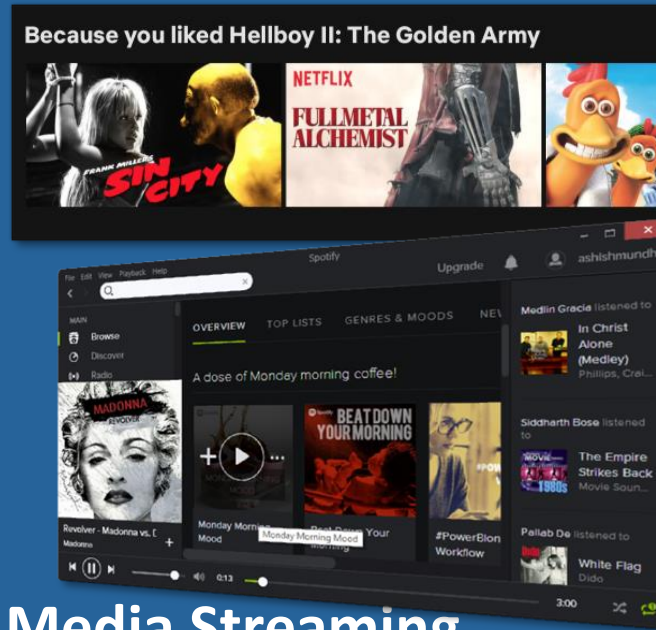
- Analyze images
- Comprehend speech
- Interact with users in natural ways
- Make predictions using data, and much more.

Artificial Intelligence in our daily lives



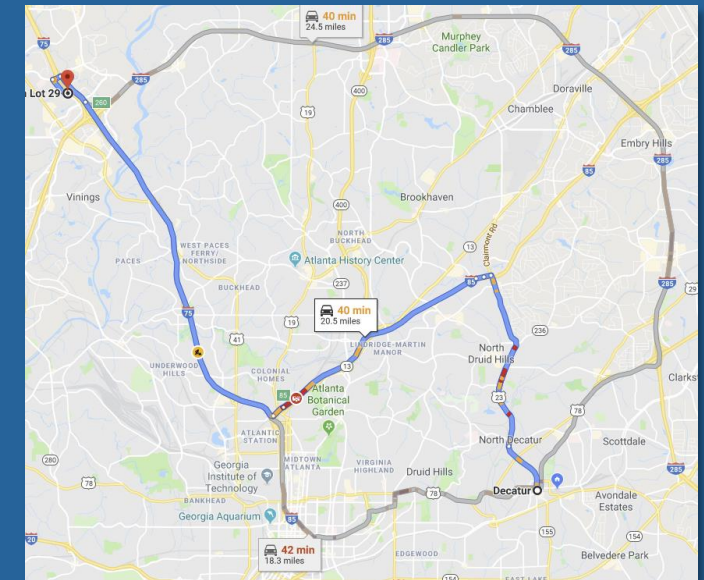
Smart Assistants

Alexa | Siri | Cortana



Media Streaming

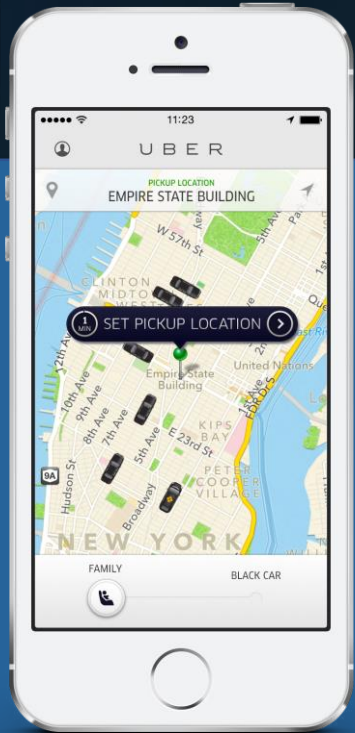
Netflix | Spotify | YouTube



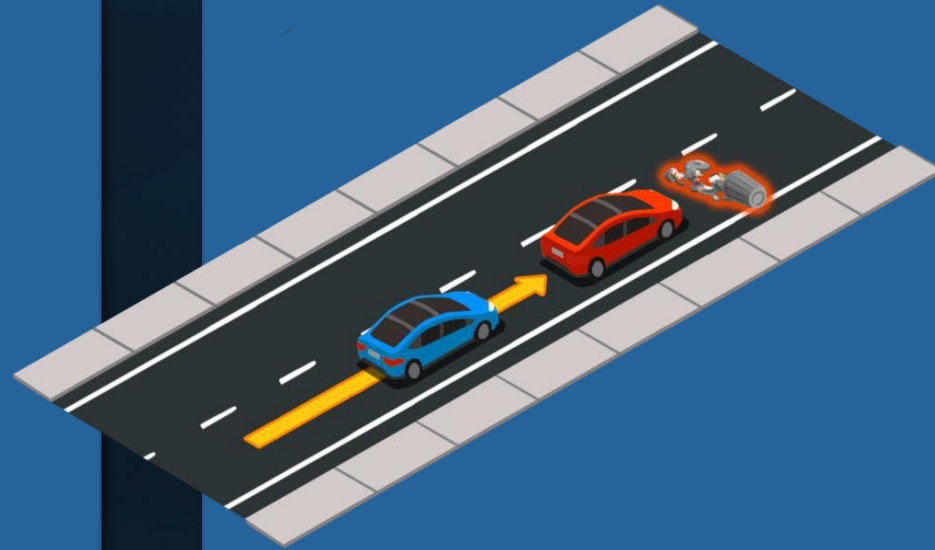
Navigation

Google Maps | Waze

AI in our daily lives



Uber | Lyft



Crash Avoidance

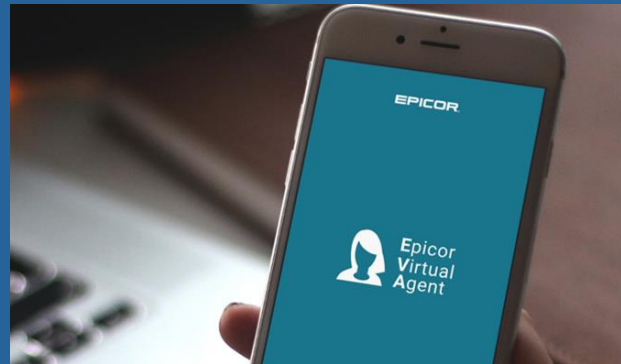


Fraud Detection

AI in business



Business Travel



Ready-to-run Bots



Employment Predictor

INTELLIGENT ECONOMIES Expected impact from AI:

27%

AI already incorporated into key processes and services.

46%

AI pilot projects underway



The Economist Intelligence Unit *sponsored by Microsoft* 2018

southtec®

THE DEMOCRATIZATION OF AI

Artificial intelligence in MANUFACTURING



AI in Manufacturing: **EXAMPLES**



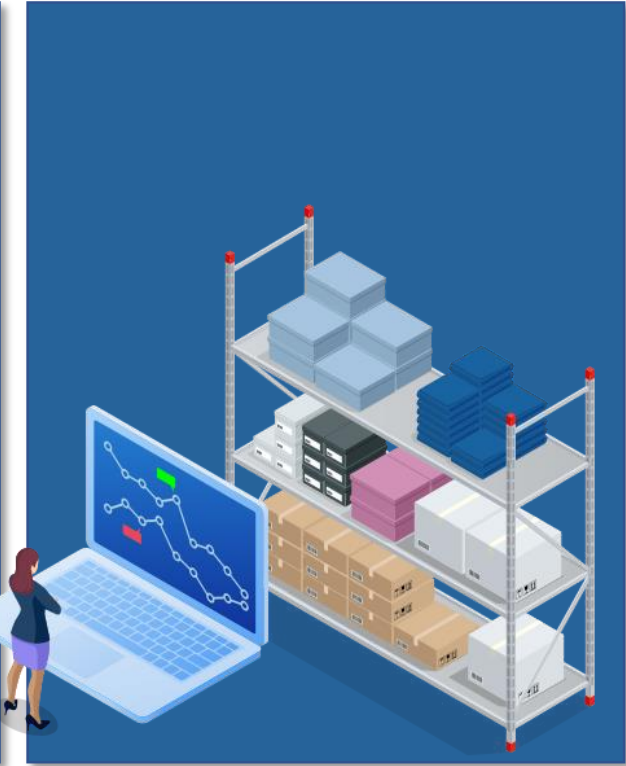
Production line efficiency



Predictive maintenance and failure detection

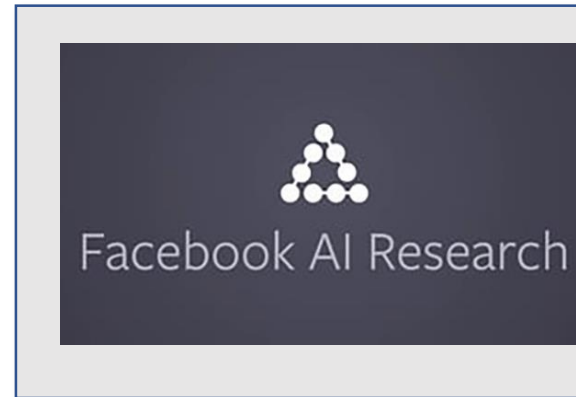
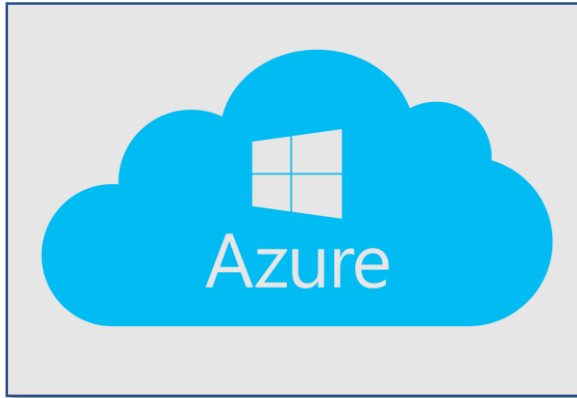


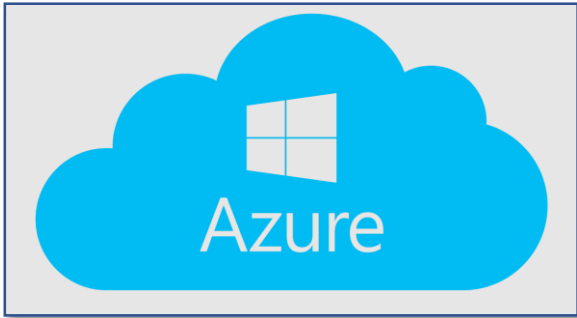
Logistics and intelligent routing



Inventory management

Who are the major players?





The Democratization of AI via:
The Microsoft Azure AI Platform

Leverage the same AI technology that powers Microsoft Apps

Let's use machine learning

Cloud-based platform

Ready-to-run modules

Start free, then pay as you go

southtec®

Microsoft AI: Key Components



Azure AI Key Components:

AI Apps and Agents

Cognitive Services

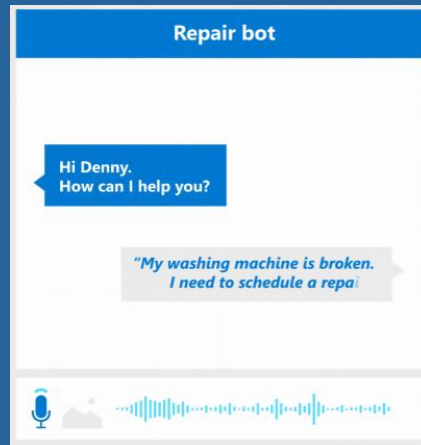
Domain specific pre-trained AI models that can be customized with your data.

•[Vision](#) > [Speech](#) > [Language](#) > [Decision](#) >



Bot Service

A purpose-built bot development environment with out-of-the-box templates to get started quickly.



Knowledge Mining

Azure Search

Form Recognizer

Machine Learning

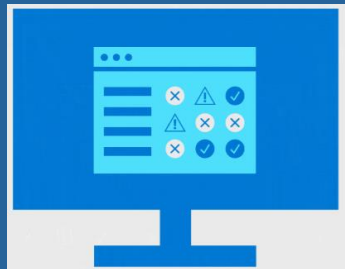


AI Apps and Agents

Cognitive Services

Domain specific pre-trained AI models that can be customized with your data.

•[Vision](#) > [Speech](#) > [Language](#) > [Decision](#) >



COGNITIVE SERVICES

1. Vision
2. Speech
3. Language
4. Decision

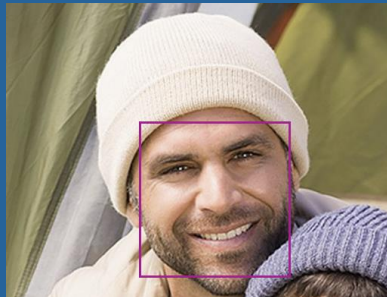
Azure AI Key Components: Cognitive Services: 1. VISION

COMPUTER VISION VIDEO INDEXER



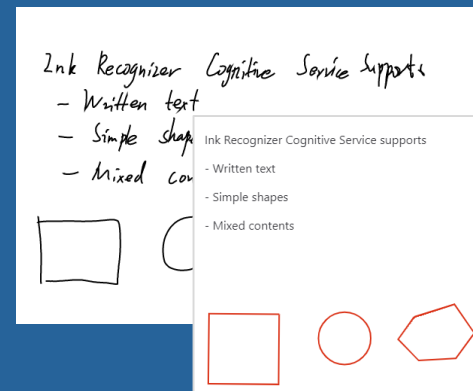
Gain insights from images, documents, and media

FACE



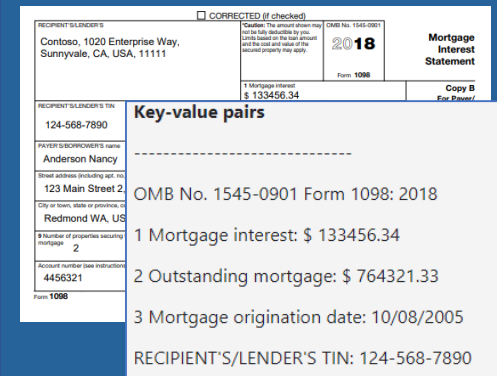
Detect persons, faces, and emotions from images

INK



Recognize hand-written content

FORM RECOGNIZER



Transform documents into usable content

SPEECH SERVICES



Speech to text
transcription.

Text to natural
speech.

SPEAKER RECOGNITION



Identify individual
speakers or use
speech for
authentication

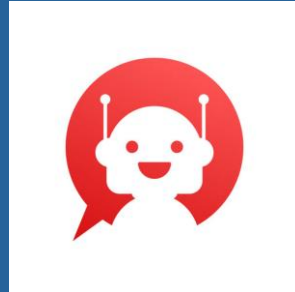
Cognitive Services: 3. LANGUAGE

TEXT ANALYTICS



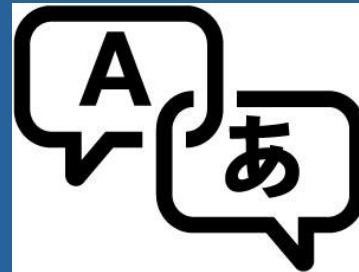
Detect sentiment, key phrases, people and language from your text

QnA MAKER



Go from semi-structured content to conversational bot in minutes

TRANSLATOR TEXT



Conduct real-time text translation.

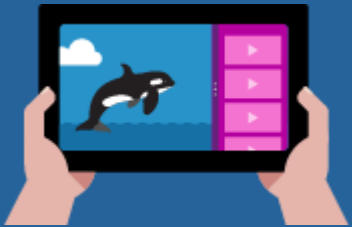
LANGUAGE UNDERSTANDING



Build natural language understanding into apps, bots, and IoT devices.

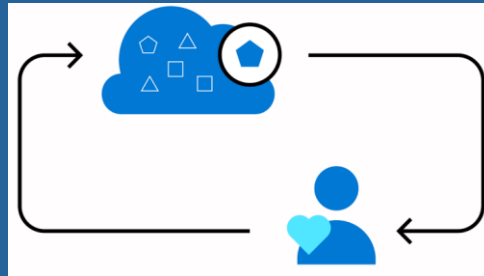
Cognitive Services: 4. DECISION

CONTENT MODERATOR



Detect offensive images, text, and adult content.

PERSONALIZER



Deliver rich, personalized experiences for every user.

ANOMALY DETECTOR



Foresee problems before they occur with early detection.

Azure AI Key Components:
AZURE SEARCH

SPELL CHECK



ENTITY SEARCH



AUTOSUGGEST



CUSTOM SEARCH



IMAGE SEARCH



VISUAL SEARCH



NEWS SEARCH



WEB SEARCH



VIDEO SEARCH



LOCAL BUSINESS
SEARCH



Using AI to Explore the JFK Files | 34,000 pages Combining Azure AI Services

Q pswald x SEARCH

857 results found

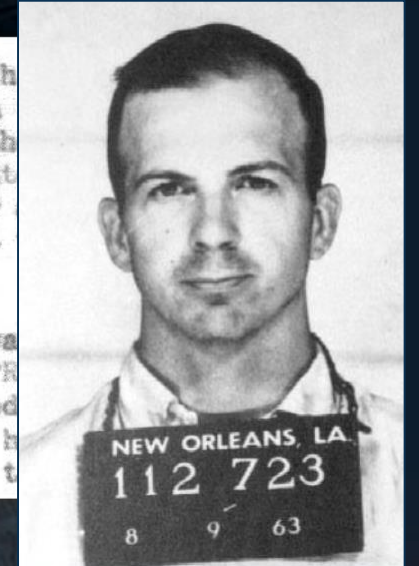
TAGS ▾

- John F. Kennedy (843)
- Central Intelligence Agency (CIA) (831)
- Document (811)
- Information (673)
- Lee Harvey Oswald (669)
- Northwest, Washington, D.C. (647)
- Act of Congress (643)
- Emmett Hudson (620)
- Federal Bureau of Investigation (607)
- Classified information (562)
- United States (457)

- OCR + Handwriting
- Computer Vision
- Entity Linking
- Language Translation
- Azure Search

written a book on the OSWALD case which
of April. He has spent many days in
essed him favorably though he was rather
He found Mrs. OSWALD exceedingly int
to her new riches. The image of her
sly false, but LEVINE does admit that
ve.

ed LEVINE if he thought Mrs. OSWALD wa
that she was a Soviet patriot. When PR
he replied
s. OSWALD h
D had not t



Lee Harvey Oswald

March 26, 1964

3-3-93 RDD/KSR
Classified by 9803 ON: OADR
DECLASSIFY ON: OADR (JFIC)

By letter dated November 29, 1963, [redacted] advised [redacted], that several persons had contacted his office and stated that LEE OSWALD had been seen distributing pamphlets entitled "Fair Play for Cuba," on St. Jacques and McGill Streets in Montreal during the Summer of 1963.

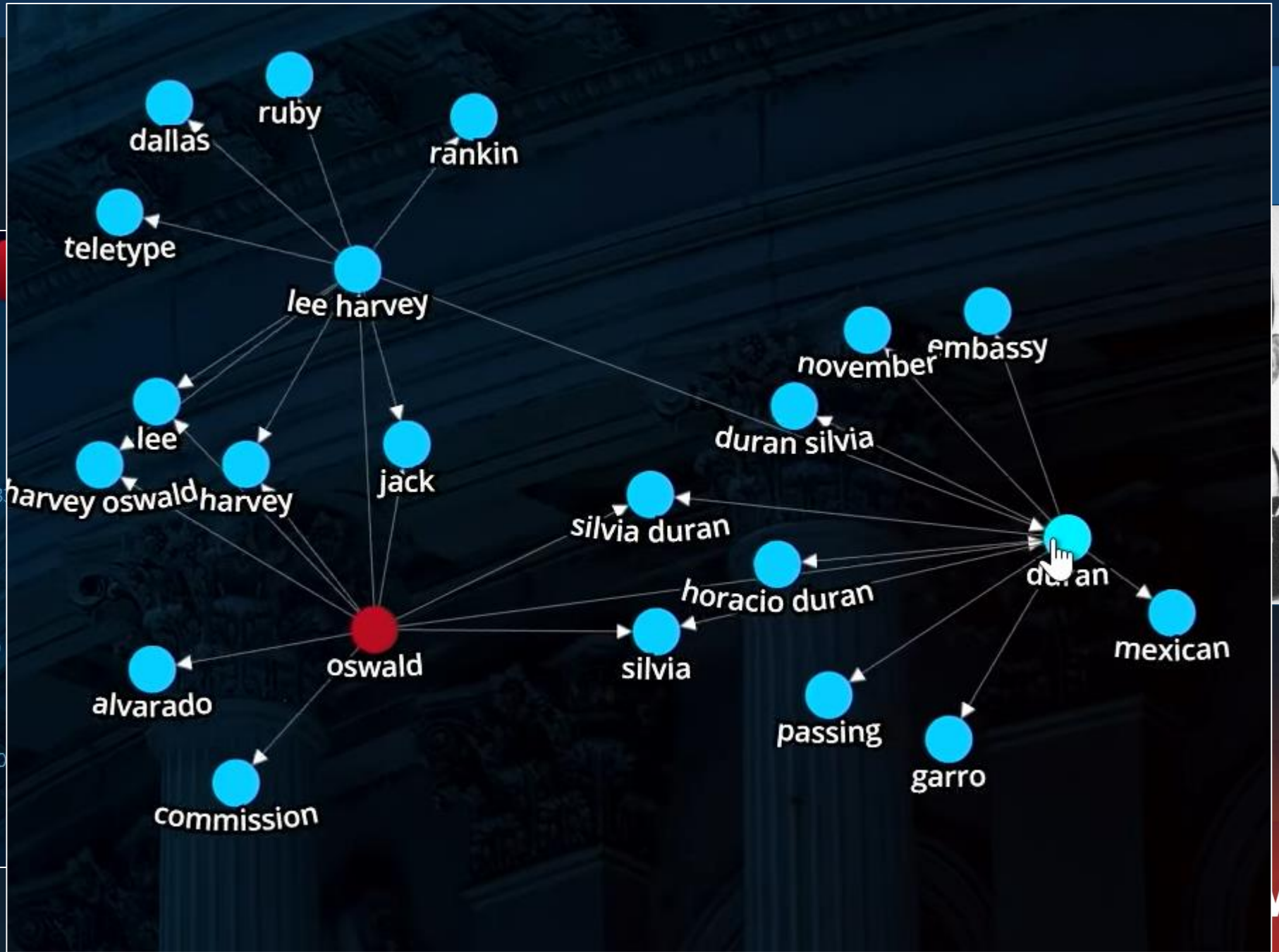
about the assassination and Lee Harvey Oswald were written down
by the Mexican government and Sylvia signed the statement.

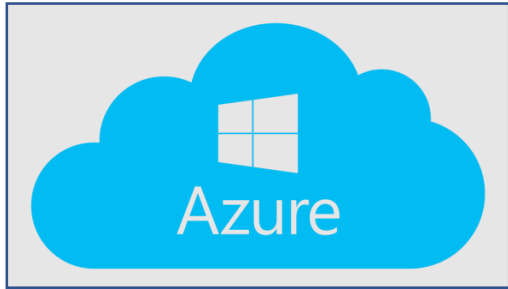
Q x

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+



Internet of Things

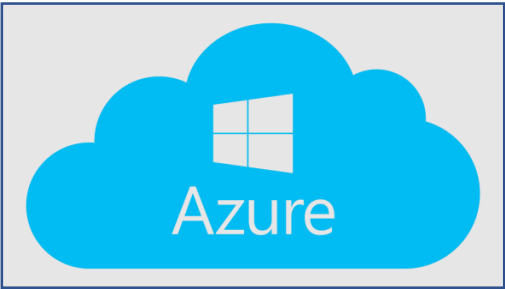
Artificial Intelligence

Advanced Search

**Ready-to-Run
AI Bots**

Speech to Text

Other Use Cases



**Cognitive
Services:**

**COMPUTER
VISION EXAMPLE**



Predictions

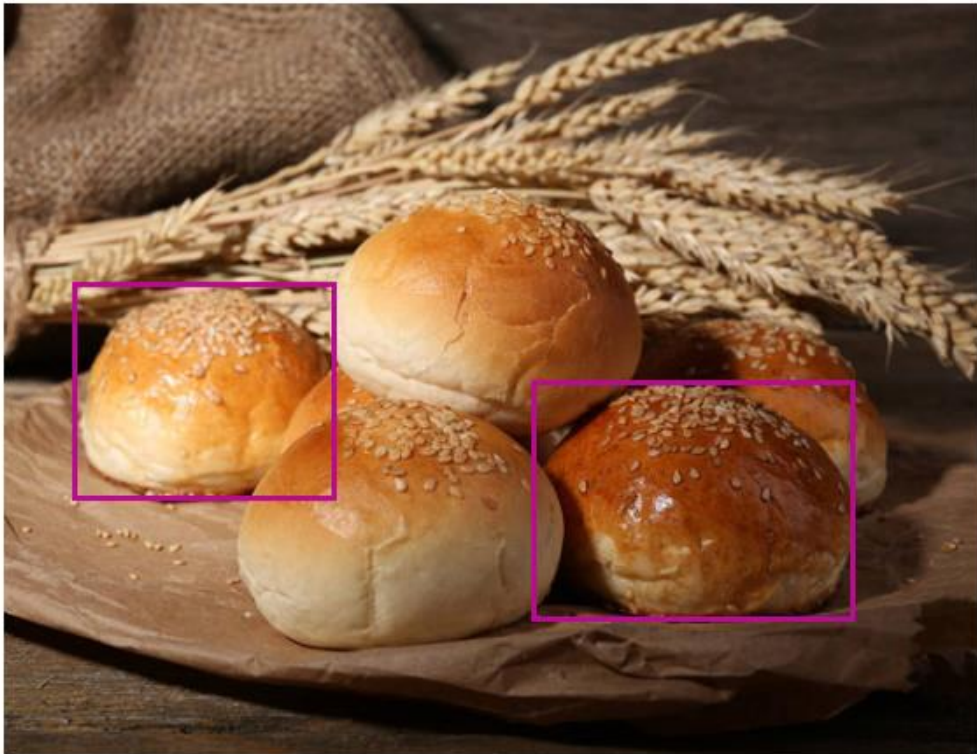
Tag	Probability
Grade A	99.5%
Grade B	0.7%



Predictions

Tag	Probability
Grade B	97.7%
Grade A	0.9%

Azure AI Key Components: Cognitive Services Example

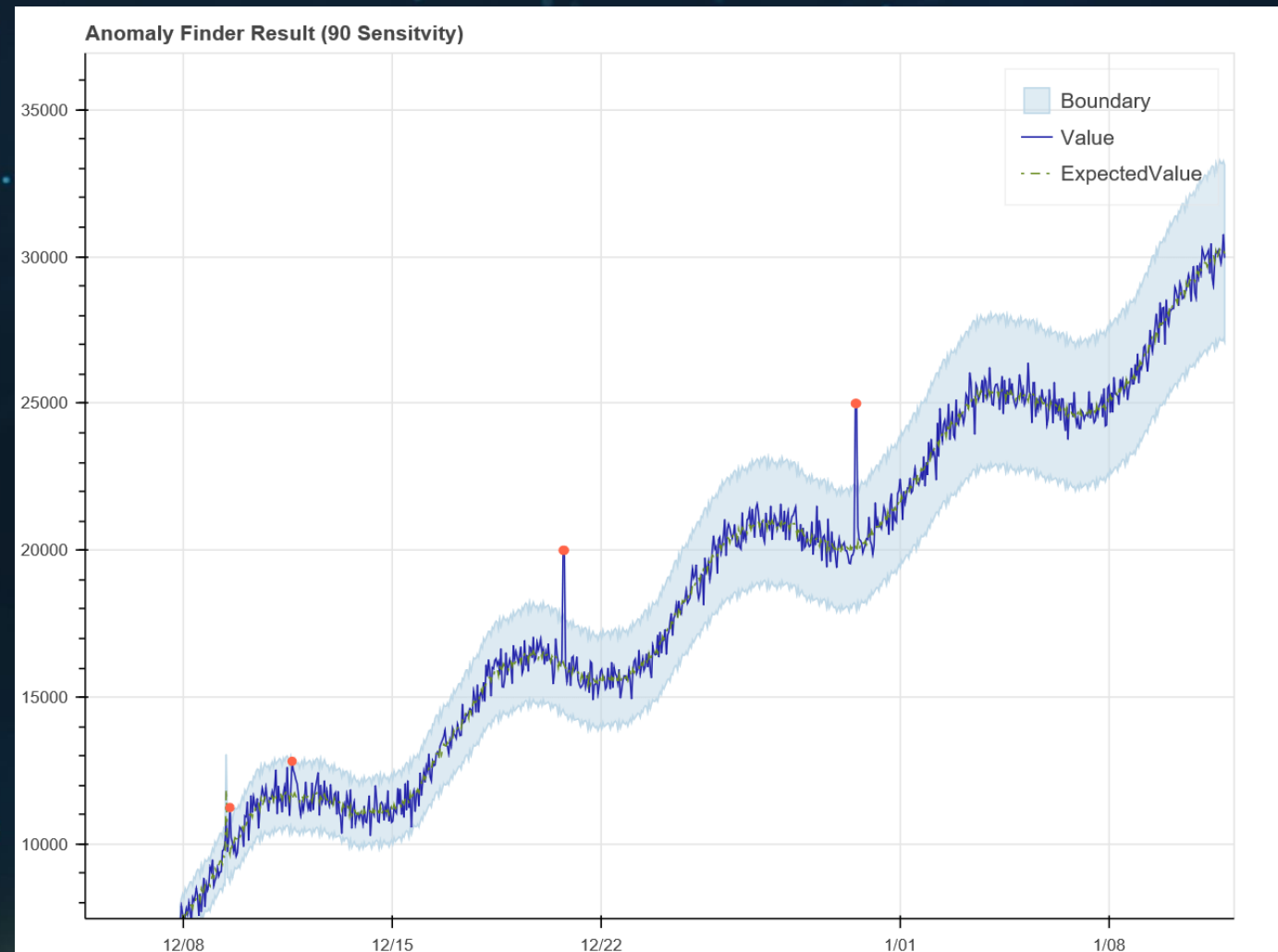


FEATURE NAME:	VALUE
Objects	[{ "rectangle": { "x": 44, "y": 172, "w": 161, "h": 132 }, "object": "Food", "confidence": 0.552 }, { "rectangle": { "x": 326, "y": 230, "w": 199, "h": 147 }, "object": "donut", "confidence": 0.652 }]
Tags	[{ "name": "baked goods", "confidence": 0.9914949 }, { "name": "fast food", "confidence": 0.9694487 }, { "name": "bun", "confidence": 0.9081944 }, { "name": "bread roll", "confidence": 0.800775468 }, { "name": "dessert", "confidence": 0.7862985 }, { "name": "food", "confidence": 0.7569548 }, { "name": "brioche", "confidence": 0.7129768 }, { "name": "sourdough", "confidence": 0.6970197 }, { "name": "loaf", "confidence": 0.687088549 }, { "name": "hamburger", "confidence": 0.6838401 }, { "name": "ciabatta", "confidence": 0.66836077 }, { "name": "sandwich", "confidence": 0.6475379 }, { "name": "potato bread", "confidence": ... }]

Azure AI Key Components: Cognitive Services Example

Anomaly Detector

Embed anomaly detection capabilities into your apps so users can quickly identify problems.



Azure AI Key Components: Azure Search Example

Form Recognizer

Quickly extract text and structure from documents

Contoso					
Bill To:	Contoso, Ltd	Phone: 432-555-0189	Invoice #:	3-456-2	
		Fax: 432-555-0123	Invoice Date:	4/14/2019	
		Email: contoso@example.com			
Invoice For: Project 2					
Item #	Description	Qty	Unit Price	Discount	Price
24567	Invoice 3-456-2 Data 1	39	\$ 5.00	\$ -	\$ 195.00
24568	Invoice 3-456-2 Data 2	40	4.00	5.00	155.00
24569	Invoice 3-456-2 Data 3	30	6.00	7.00	173.00
24570	Invoice 3-456-2 Data 4	40	7.00	-	280.00
24571	Invoice 3-456-2 Data 5	10	4.00	-	40.00
24572	Invoice 3-456-2 Data 6	5	8.00	-	40.00
24573	Invoice 3-456-2 Data 7	70	6.00	-	420.00
24574	Invoice 3-456-2 Data 8	25	4.00	-	100.00
24575	Invoice 3-456-2 Data 9	5	7.00	3.00	32.00
24576	Invoice 3-456-2 Data 10	80	1.00	-	80.00
24577	Invoice 3-456-2 Data 11	65	7.00	-	455.00
24578	Invoice 3-456-2 Data 12	44	1.00	-	44.00

Key-value pairs

Bill To: Contoso, Ltd

Phone: 432-555-0189

Invoice #: 3-456-2

Fax: 432-555-0123

Invoice Date: 4/14/2019

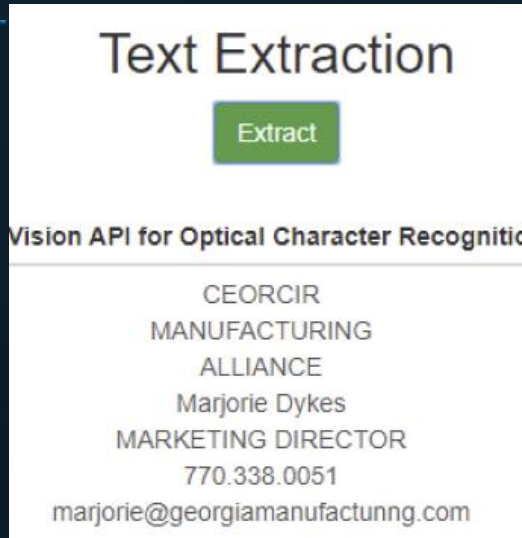
Email: contoso@example.com

Invoice For: Project 2

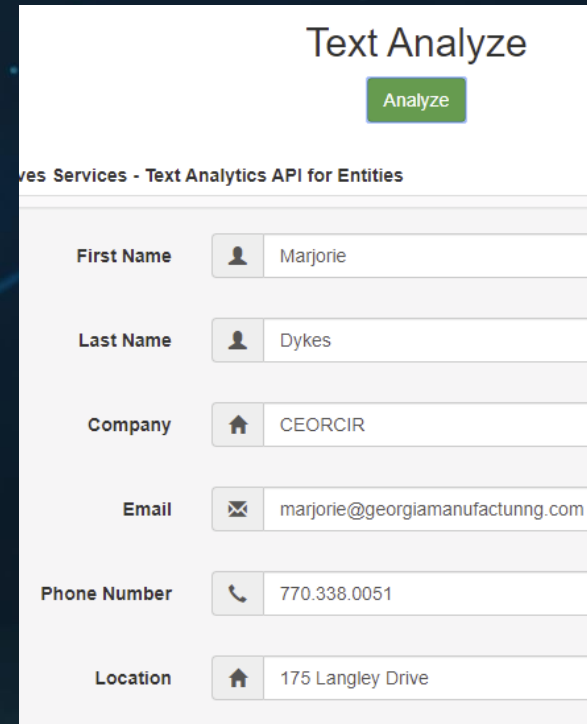
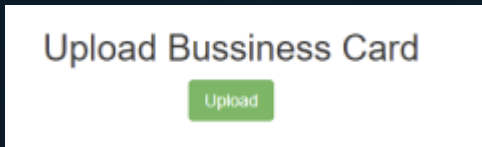
Invoice Subtotal: 2,014.00

Tax Rate: 8.75%

Azure AI Key Components: Business Card Conversion Example



Text extracted with
OCR + Computer Vision



Text analyzed
with Text
Analytics API
to recognize
fields and
parse data

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**FORMETCO:
Manufacturing example
with the Azure AI platform**



The Challenge:

How do you monitor 1100 digital billboards in real time?

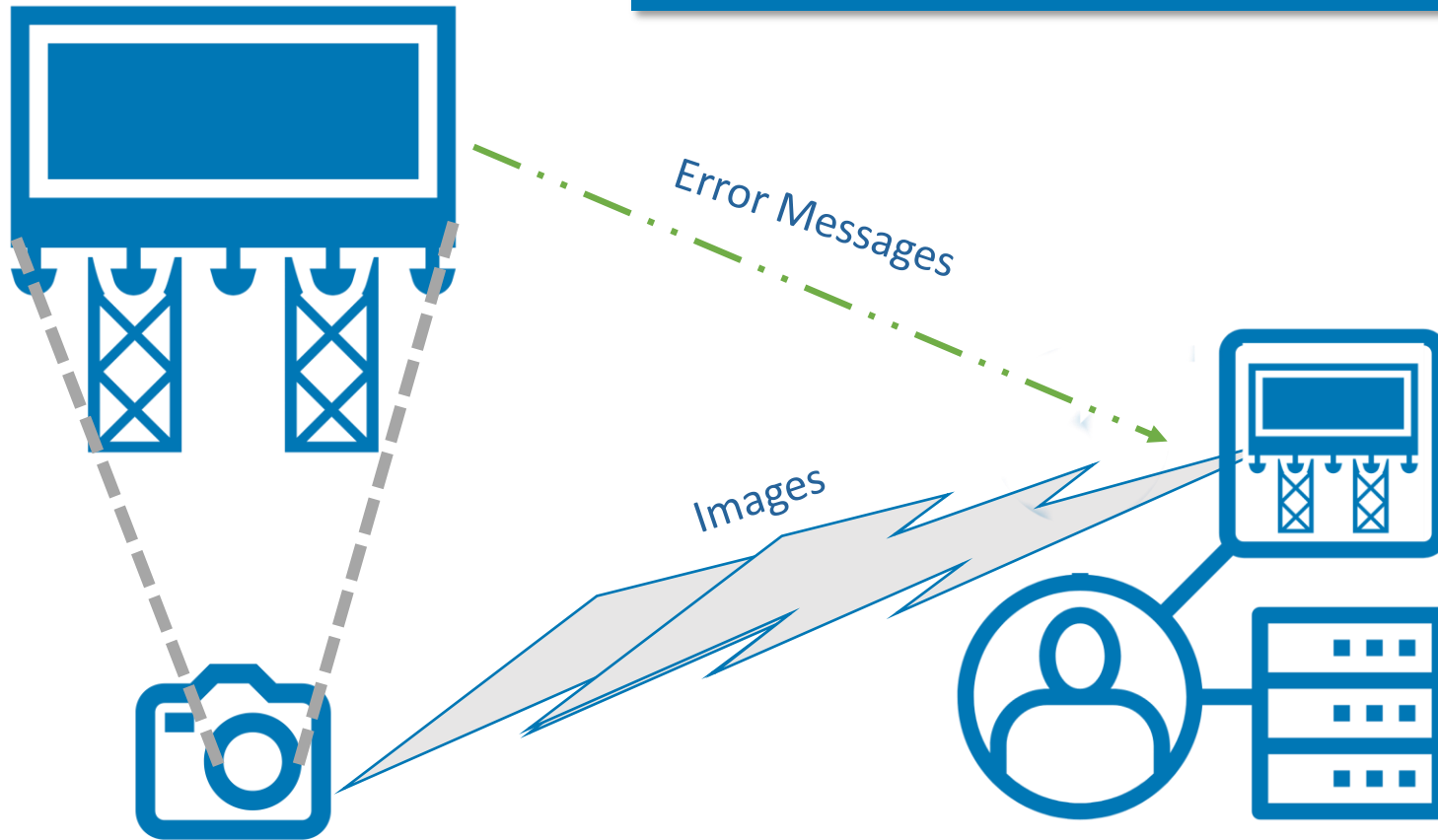
FORMETCO

Formetco designs & manufactures LED Digital Billboards

- 1100 billboards installed and maintained for outdoor advertising companies.
- Service and maintenance provide a key source of revenue.
- Logistics challenge to monitor billboard performance to:
 - meet customer expectations,
 - enhance productivity, and
 - increase profitability



Using Azure AI Platform to Monitor Billboards

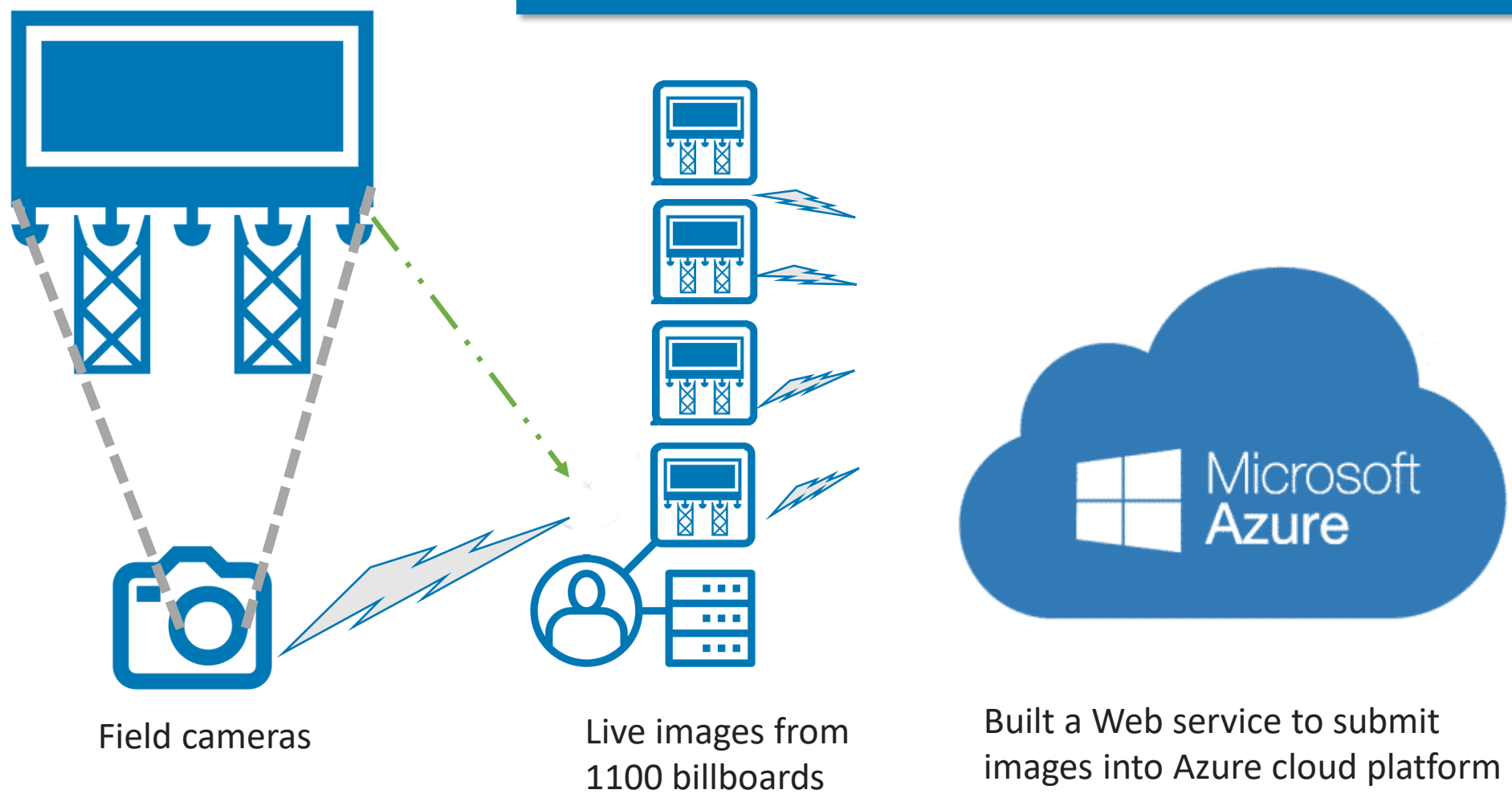


Formetco's Existing System:

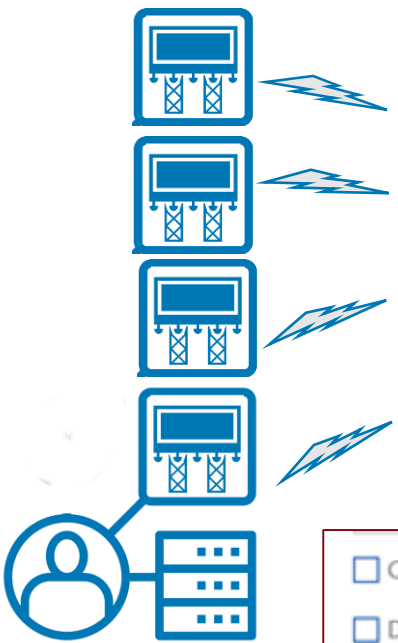
1. Billboard monitoring cameras
2. CRM built on Microsoft Dynamics 365
3. Images attached to alerts received from cameras in the field

THE PROBLEM: Time-consuming manpower needed to review thousands of images

1. Uploaded images into the Azure platform



2. Training the System



<input type="checkbox"/>	CAMERAABSTRACTED	56	...
<input type="checkbox"/>	DOWN	197	...
<input checked="" type="checkbox"/>	GOOD	1013	...
<input type="checkbox"/>	INDECISIVE	203	...
<input type="checkbox"/>	PANELOUT	286	...

Good



Down



Panel Out

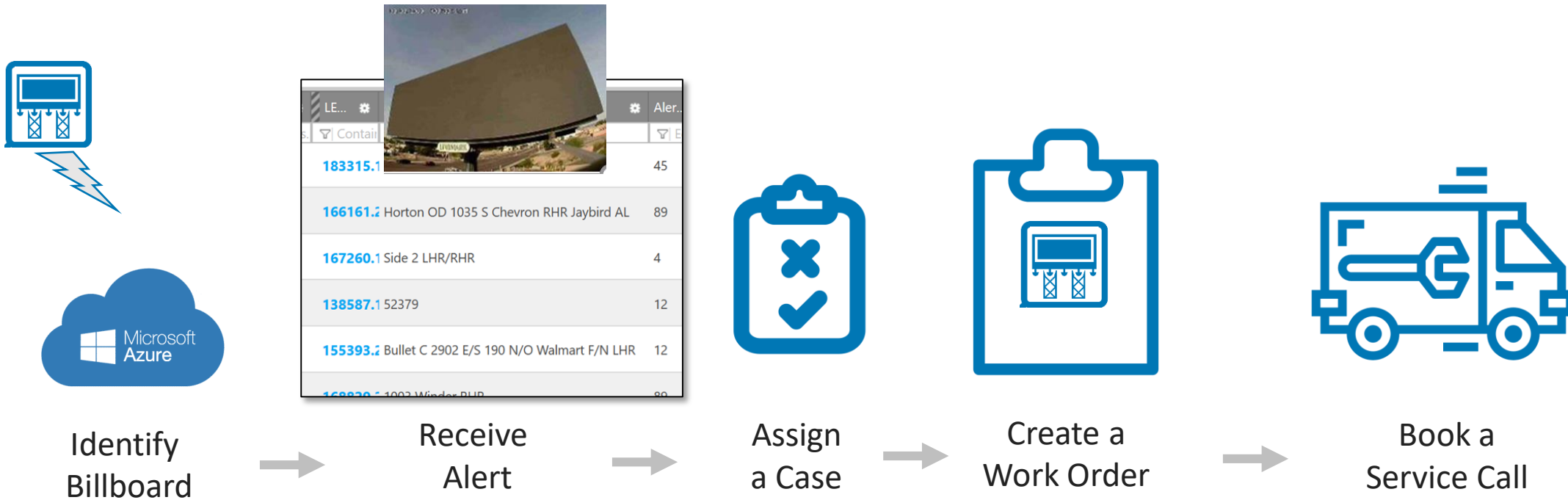


3. Alert List Results

ID	LE...	LED ID	Aler...	Alert Code Name	Ca...	P... ↑	Revi...	Type	Created Date	IdDoc	Cam...	E..	Rela...	Tag	Tag2
5350439	183315.1	Malone Sikeston RHR	45	ERROR_OUTPUT_DISABLED_NO_CONTROLLERS		High	✘	Web Service	10/22/2019 07:33 AM		📷		⚠️		
5350411	166161.2	Horton OD 1035 S Chevron RHR Jaybird AL	89	ERROR_MONITOR_POWER_OFF		High	✘	Web Service	10/22/2019 07:29 AM	🔗	📷		⚠️	GOOD 96%	GOOD 94%
5350347	167260.1	Side 2 LHR/RHR	4	ERROR_CONTROLLER_OUTPUT_CONFLICT_DETECTED		High	✘	Web Service	10/22/2019 07:19 AM		📷		⚠️		
5350272	138587.1	52379	12	FEEDBACK_POWERSUPPLY_FAILED		High	✘	Web Service	10/22/2019 07:02 AM	🔗	📷		⚠️	PANELOUT 73%	PANELOUT 86%
5350189	155393.2	Bullet C 2902 E/S 190 N/O Walmart F/N LHR	12	FEEDBACK_POWERSUPPLY_FAILED		High	✘	Web Service	10/22/2019 06:48 AM	🔗	📷		⚠️	GOOD 41%	PANELOUT 77%
5350163	168829.2	1003 Winder RHR	89	ERROR_MONITOR_POWER_OFF		High	✘	Web Service	10/22/2019 06:43 AM	🔗	📷		⚠️	GOOD 98%	GOOD 91%
5350162	181919.1	North Cobb High School Football	45	ERROR_OUTPUT_DISABLED_NO_CONTROLLERS		High	✘	Web Service	10/22/2019 06:43 AM		📷		⚠️		
5350122	175733.1	North Face	88	ERROR_DISPLAY_FREEZE_NOTIFICATION		High	✘	Web Service	10/22/2019 06:35 AM		📷		⚠️		
5350081								Web			📷		⚠️		
5350102										🔗	📷		⚠️	PANELOUT 73%	PANELOUT 86%
5349994										🔗	📷		⚠️	GOOD 41%	PANELOUT 77%
5349991										🔗	📷		⚠️	GOOD 98%	GOOD 91%

Formetco staff can quickly identify problem billboards based on AI scoring system.

4. AI-Enhanced Service Workflow



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Manufacturing
GETTING STARTED WITH AI



1. Examine Your Workflows

Look for new sources of value and growth

Discover areas where AI technologies can achieve such goals:

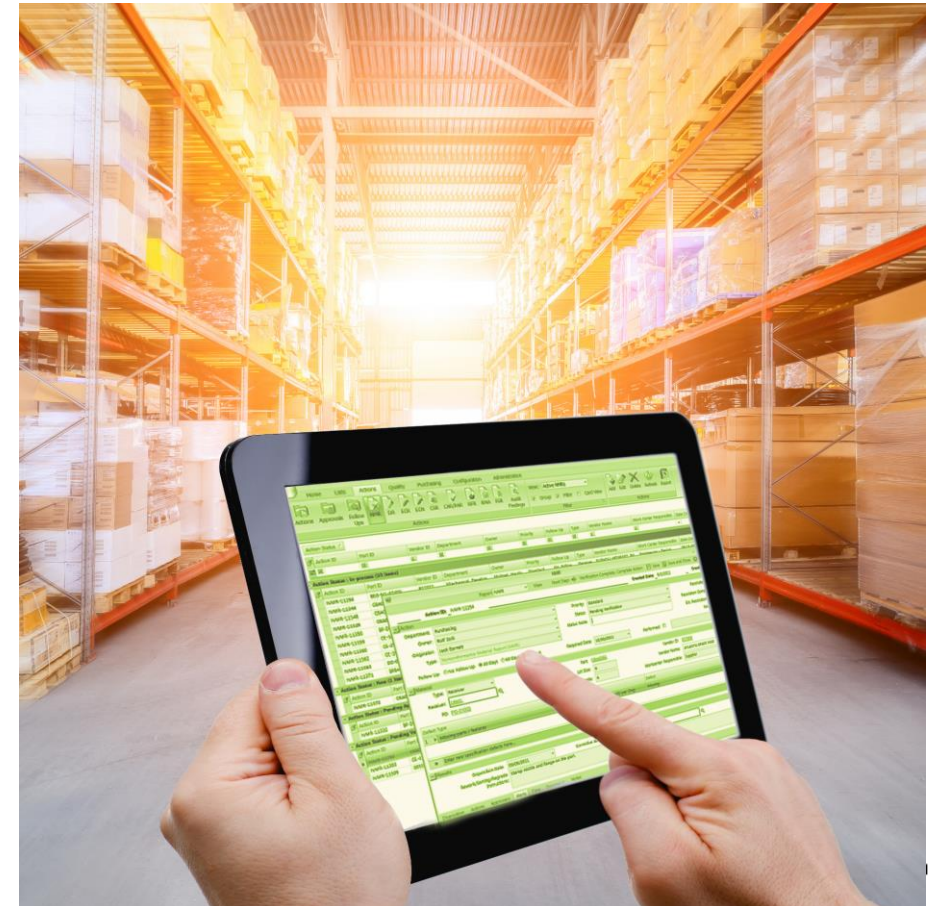
- Process innovation
- Product innovation
- Improve customer service
- Boosting output per worker



2. Determine Value

Explore use cases for Artificial Intelligence

- Define key performance indicators you wish to achieve
- Find some "quick wins" with identifiable return on investment
- Ask the question: "How is this creating customer value?"



3. Implement your first project

Start small, think big

- Adopt a data analysis mindset
- Modernize your ERP and IT infrastructure to integrate with AI
- Plan for scalable and adaptable systems



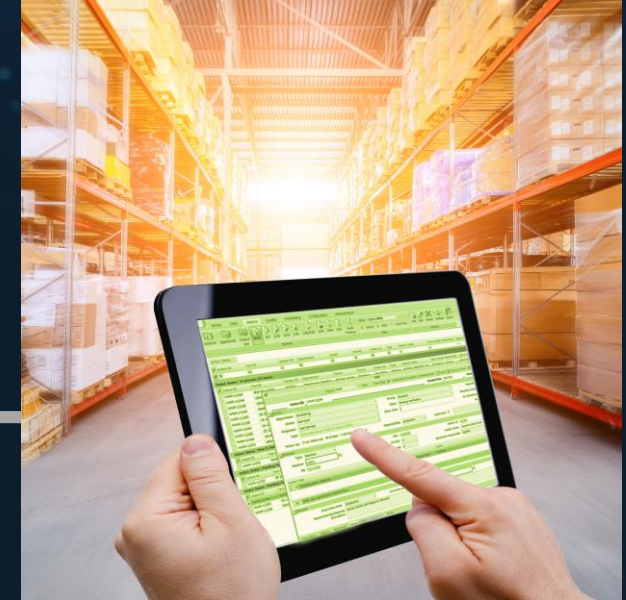
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SUMMARY



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AI is the natural next step for manufacturers...



For companies already using cloud-based management and productivity solutions...

...Microsoft's AI infrastructure is now available to small and medium-sized businesses.

All that is needed is the vision

southtec®

A Manufacturing Technology Series Event

