

# FUELING DIGITAL TRANSFORMATION WITH ADVANCED ANALYTICS

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# Agenda

- What do we mean by “advanced analytics”
- Azure machine learning overview
- Azure cognitive services
- Demonstrations
  - AI builder: online shopper intention
  - AI builder: form recognition
  - AutoML: customer churn prediction
  - AML: computer vision – product defect detection
- Application: Prevedere – intelligent forecasting

# What is advanced analytics?



predictive analytics



machine learning



artificial intelligence

# What is predictive analytics?



**Predictive analytics refers to the field of data science that involves making predictions about future events. By using different statistical techniques like linear regression an algorithm analyzes past data to make predictions about the future events.**



## **A predictive analytics model is based on 3 key elements:**

**Historical data** - To make predictions about future, a machine needs past data. Predictions are made about the future based on the trends in this data.

**Statistical modeling** - Many complex statistical algorithms are used to make sense out of past data and make predictions about the future. Regression analysis, in particular, linear regression is the most common approach used to understand correlations between different variable factors to the one fixed factor.

**Assumptions** - Predictive analytics is based on the simple assumption that future trends in data are based on past trends and the level of correlation between varied factors will continue to stay true in future, just like in present.

# What is machine learning?

“Machine learning is the study of computer algorithms that improve automatically through experience.”

Tom Mitchell, “Machine Learning”,  
McGraw Hill, **1991**

# What is artificial intelligence?

“Artificial intelligence is the science and engineering of making computers behave in ways that, until recently, we thought required human intelligence.”

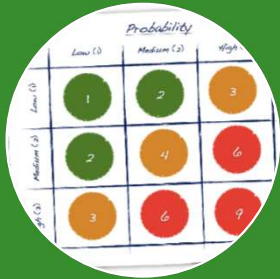
Andrew Moore, Dean of the School of Computer Science at Carnegie Mellon University

# Applications of machine learning

Supervised			Unsupervised	
Classification	Regression	Time-series prediction	Clustering	Association
<ul style="list-style-type: none"><li>• A classification problem is when the output variable is a category, such as “red” or “blue” or “disease” and “no disease”.</li></ul>	<ul style="list-style-type: none"><li>• A regression problem is when the output variable is a real value, such as “dollars” or “weight”</li></ul>	<ul style="list-style-type: none"><li>• A time series is modeled to determine its components in terms of seasonal patterns, trends, relation to external factors, to forecast future values of that series</li></ul>	<ul style="list-style-type: none"><li>• A clustering problem is where you want to discover the inherent groupings in the data, such as grouping customers by purchasing behavior.</li></ul>	<ul style="list-style-type: none"><li>• An association rule learning problem is where you want to discover rules that describe large portions of your data, such as people that buy X also tend to buy Y.</li></ul>



# Business applications of AI



Lead scoring



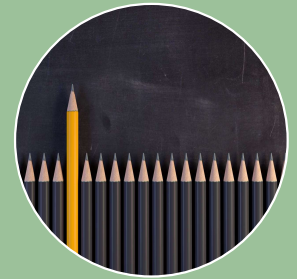
Chatbot/digital agent



Autonomous warehouse operations



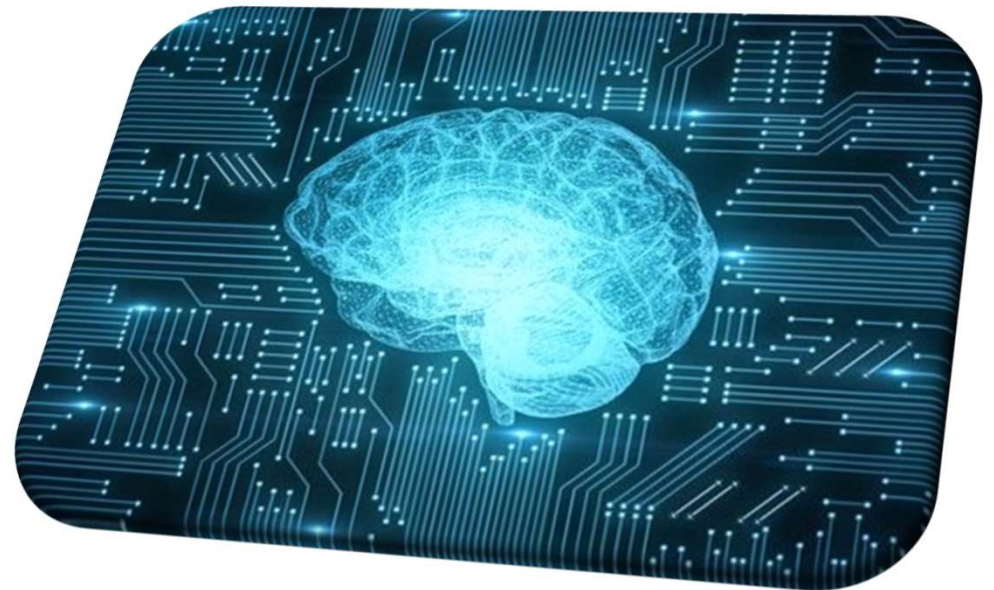
Fraud detection



Quality control

# Out-of-the-box AI solutions

- **Sales Insights add-in for Dynamics 365 Sales**
  - Increase sales and improve decision making with AI-powered insights fueled by customer data.
- **Customer Service Insights for Dynamics 365 Customer Service**
  - Leverage AI-driven insights to make better decisions and proactively improve customer satisfaction with confidence.
- **Dynamics 365 Fraud Protection**
  - Help protect your e-commerce business—and your customers—against fraud and improve your shopping experiences.



# Azure machine learning

## Build business-critical machine learning models at scale

Empower data scientists and developers to build, deploy, and manage high-quality models faster and with confidence. Accelerate time to value with industry-leading machine learning operations (MLOps), open-source interoperability, and integrated tools. Innovate on a secure, trusted platform designed for responsible AI applications in machine learning.



### Rapidly build and train models

Use the studio development experience to access built-in tools and best-in-class support for open-source frameworks and libraries.



### Deliver responsible solutions

Develop models for fairness and explainability, use them responsibly when deployed, and govern to fulfill lineage and audit compliance requirements.



### Operationalize at scale

Deploy ML models quickly and easily, and manage and govern them efficiently, with MLOps.



### Innovate on a more secure hybrid platform

Run machine learning workloads anywhere with built-in governance, security, and compliance.

# Azure cognitive services



Cognitive services brings AI within reach of every developer—without requiring machine-learning expertise. All it takes is an API call to embed the ability to see, hear, speak, search, understand, and accelerate decision-making into your apps.



Build confidently with the first AI services to achieve human parity in computer vision, speech, and language



Deploy cognitive services anywhere from the cloud to the edge with containers

# Azure cognitive services - decisions

- **Make smarter decisions faster**
  - **Anomaly detector**
    - Identify potential problems early on.
  - **Content moderator**
    - Detect potentially offensive or unwanted content.
  - **Metrics advisor** PREVIEW
    - Monitor metrics and diagnose issues.
  - **Personalizer**
    - Create rich, personalized experiences for every user.

# Azure cognitive services - language

- **Extract meaning from unstructured text**
  - **Immersive reader**
    - Help readers of all abilities comprehend text using audio and visual cues.
  - **Language understanding**
    - Build natural language understanding into apps, bots, and IoT devices.
  - **QnA maker**
    - Create a conversational question and answer layer over your data.
  - **Text analytics**
    - Detect sentiment, key phrases, and named entities.
  - **Translator**
    - Detect and translate more than 90 supported languages.

# Azure cognitive services - speech

- Integrate speech into apps and services
  - **Speech to Text**
    - Transcribe audible speech into readable, searchable text.
  - **Text to Speech**
    - Convert text to lifelike speech for more natural interfaces.
  - **Speech Translation**
    - Integrate real-time speech translation into your apps.
  - **Speaker Recognition**
    - Identify and verify the people speaking based on audio.

# Azure cognitive services - vision

- **Identify and analyze content within images and videos**
- **Computer vision**
  - Analyze content in images and video.
- **Custom vision**
  - Customize image recognition to fit your business needs.
- **Face**
  - Detect and identify people and emotions in images.
- **Form recognizer**
  - Extract text, key-value pairs, and tables from documents.
- **Video indexer**
  - Analyze the visual and audio channels of a video and index its content.



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Enhance your business with AI

Add intelligence to your business. Create tailored AI models to automate processes and find insights. [Learn more](#)

Refine a model for your business needs

Category Classification

Categorize text by its meaning so it's easier to analyze.

Entity Extraction

Recognize specific information about your business from data.

Form Processing

Read and save information from standard documents.

Object Detection

Recognize and count things in images.

Prediction

Predict whether something will happen.

Get straight to productivity

Business Card Reader

Automatically process business card information

Category Classification (preview)

Categorize text by its meaning so it's easier to analyze

Entity Extraction

Extract entities and their types from text

Identity Document Reader

Read and save information from identity documents

Invoice Processing

Read and save information from invoices

Key Phrase Extraction

Extract the key talking points from text

Language Detection

Identify the language being used in text

Receipt Processing

Read and save information from receipts

Sentiment Analysis

Analyze positive/negative sentiment in text

Text Recognition

Automatically process text from images

Text Translation

Translate text into a new language automatically

## Demo – form recognition

Caseld: 202045038

Employer: Wide World Importers

Location: Stuttgart

Event Date: 1/5/2015

Event: Compressed or pinched by shifting objects or equipment

Nature: amputations

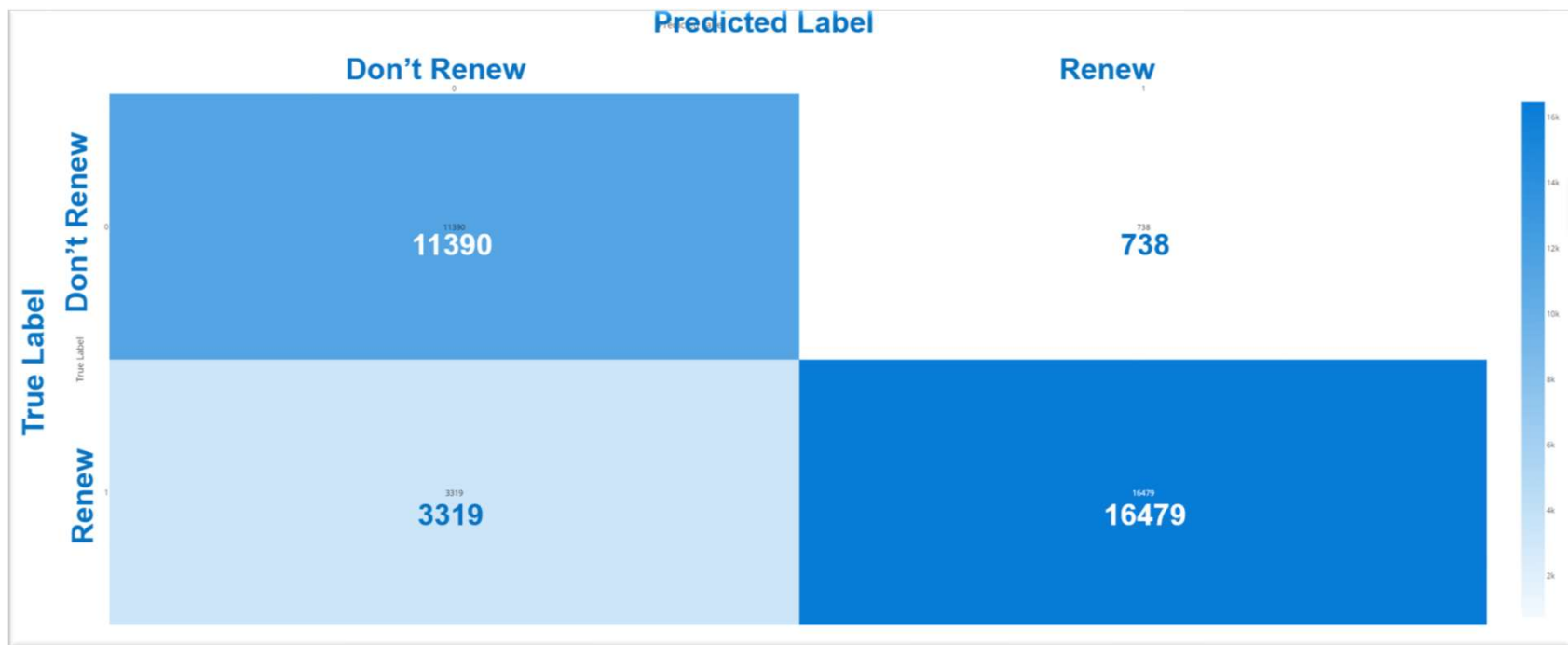
Final Narrative	Hospitalized	Amputation	Part Of Body	Source
Employee was working on a fluid end expendable pump using a torque wrench when his left ring finger got caught in between and was amputated - halfway through the nailbed.	0	1	fingernails	pumps

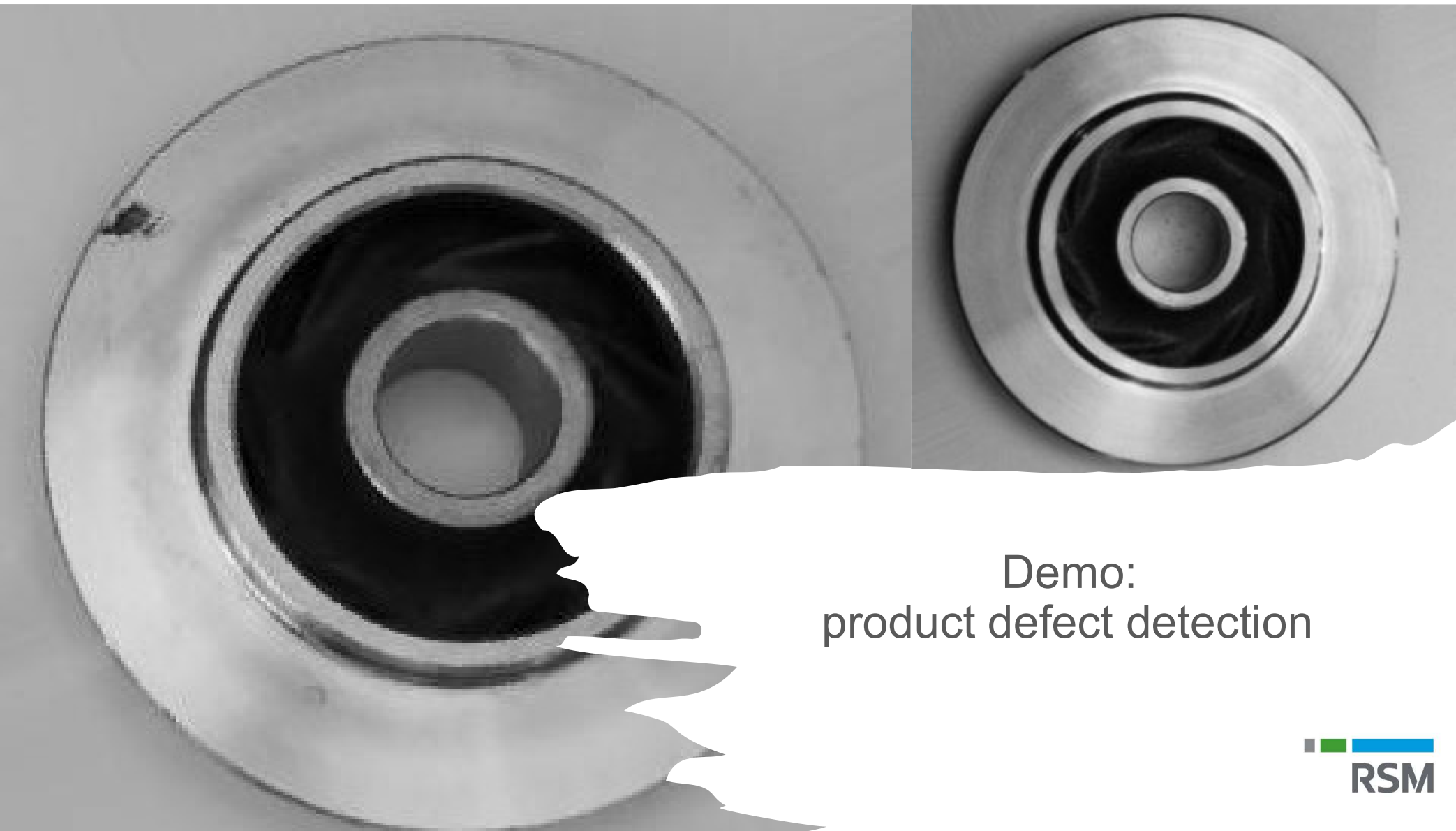
# Demo – shopper intention

The screenshot shows the Dynamics 365 Online Shopper Intention dashboard in Sandbox mode. The interface includes a left-hand navigation pane with options like Home, Recent, Pinned, and Main. The main content area displays a table titled 'OnLine\_Shopper\_Intention\_v1' with columns for Name, predicted revenue, probability, and Revenue (Label). The table lists several customers with their predicted revenue and probability values.

Name	aib_revenue - predicted (P_MSLab_SL_v1)	aib_revenue - probability (P_MSLab_SL_v1)	Revenue (Label)
Customer21	Yes	0.85	---
Customer25	Yes	0.82	---
Customer16	Yes	0.71	---
Customer3	Yes	0.66	---
Customer2	Yes	0.54	---
Customer26	Yes	0.53	---
Customer27	Yes	0.53	---
Customer12	Yes	0.50	---
Customer11	No	0.49	---

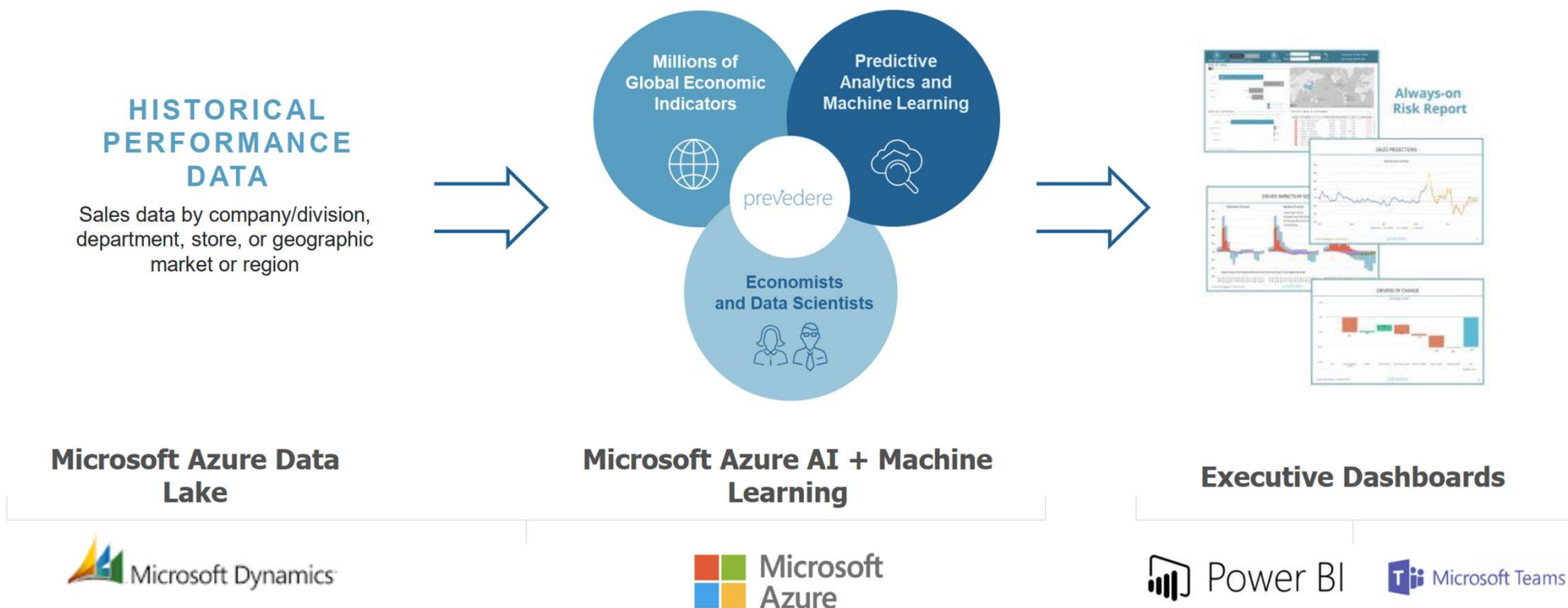
## Demo – churn prediction





Demo:  
product defect detection

# Intelligent forecasting with Prevedere



# There is a better way...

*“Going **beyond your four walls** to identify and leverage **external leading drivers** of business performance”*

Millions of in  
memory global  
data sets



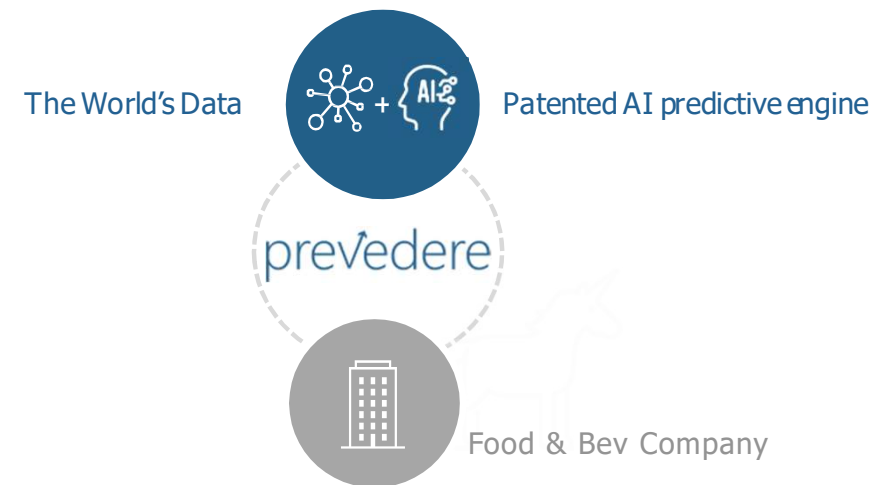
AI powered  
predictive  
analytics and  
machine  
learning

The power and scalability of  
cloud computing

## Unique solution

Prevedere's native cloud-based solution is the most automated and advanced intelligent forecasting solution.

- 4+ million curated global data series
- Internationally patented AI engine
- Always on real-time external insights
- Over 250 million models built and tested
- No new hardware or software to install



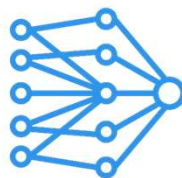
Prevedere makes your existing systems smarter and more valuable



# Leveraging global data for modeling

Millions of global data series

Economic data providers  
Weather data  
Consumer purchase intent  
Online activity  
Financial data  
Government websites  
Industry groups  
Industry forecast providers  
Mobility data  
Consumer sentiment data  
Pandemic health data  
Household surveys  
Prevedere industry leading indicators  
Population data  
Retail sales  
ATM/debit/mobile pay



#Category  
#Frequency  
#Geo Location  
#Industry relationships  
#Industry Codes  
#Type  
#Quality



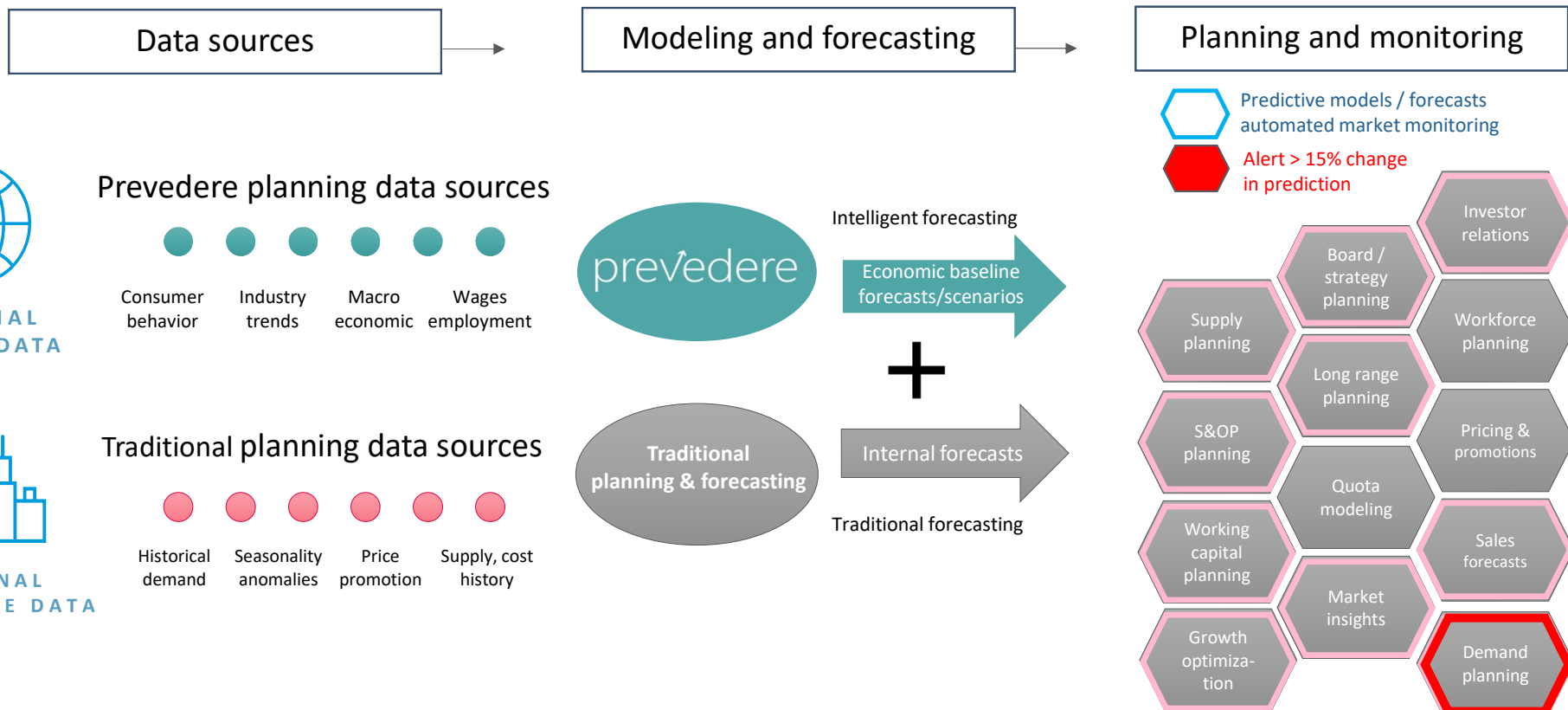
**Model-ready  
data cloud**

prevedere



# Prevedere predictive AI

## Economic forecasts, market intelligence and early warning



## Resources

- Churn model
- Product defect detection
- Form recognition
- Prevedere
  - Contact me:  
[george.casey@rsmus.com](mailto:george.casey@rsmus.com)
- Online shopper intention
  - <https://docs.microsoft.com/en-us/ai-builder/prediction-data-prep>
  - <https://docs.microsoft.com/en-us/ai-builder/prediction-create-model>

THANK YOU FOR  
YOUR TIME AND  
ATTENTION

# QUESTIONS AND ANSWERS



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