Microsoft AI

Microsoft AI in action

Ha Cole
CTO Nonprofits

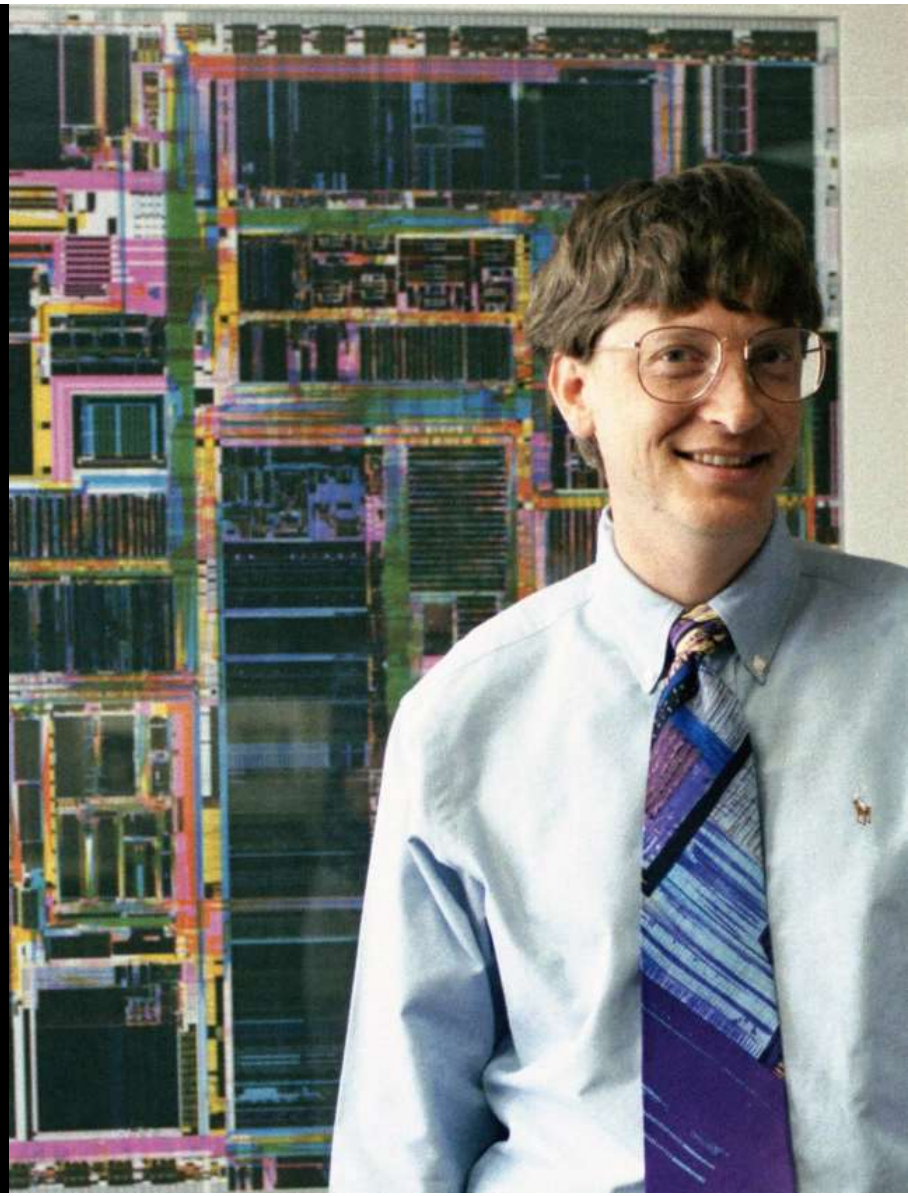
26th Oct 2022

/in/hacole

Agenda

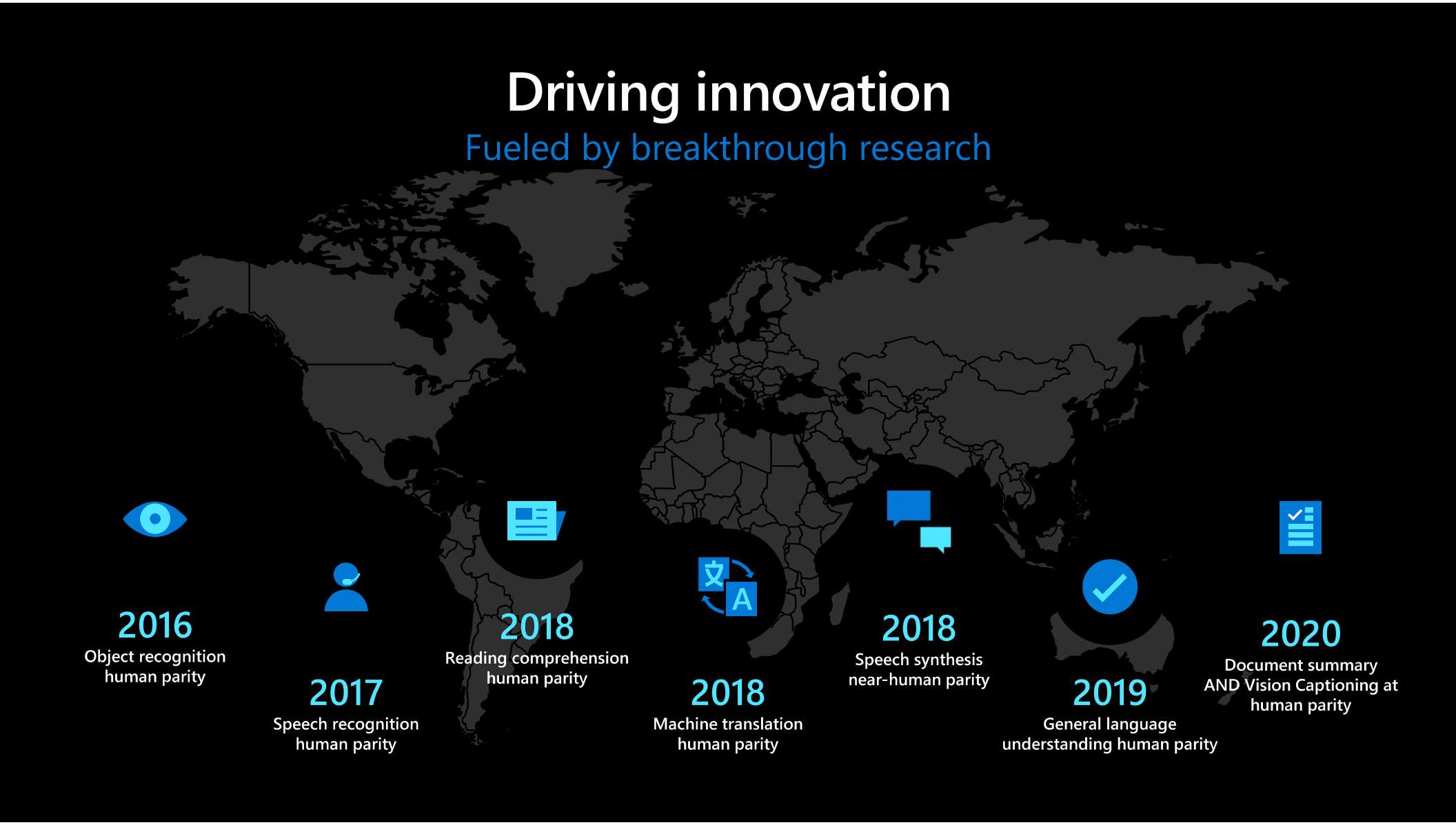
1. Microsoft AI in real life
2. Reimagine what's possible
3. An actionable start

"Computers will one day see, hear, talk, and understand human beings."



Driving innovation

Fueled by breakthrough research



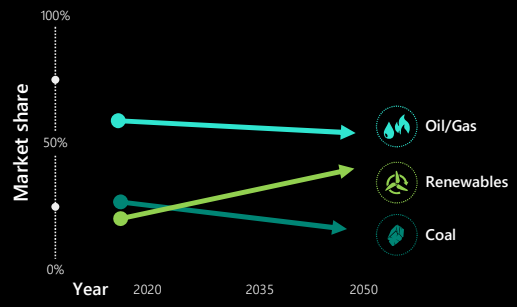
Computer vision & machine learning for safety

1 Microsoft AI in real life

Shifting Energy Landscape

ENERGY MIX

Overall Energy Demand



Power Generation

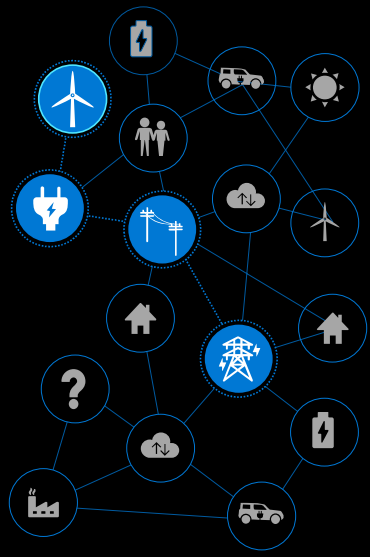
By 2035, **>50%** of electricity will be generated by renewable energy

DECENTRALIZATION

Today

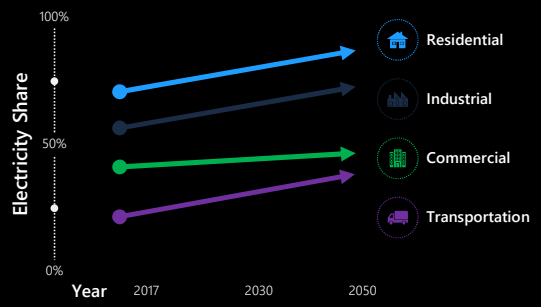
- Producer
- Grid
- Distribution Trade
- Customer

Future



ELECTRIFICATION

Power Consumption Growth



Overall Growth

By 2050, overall electricity use is expected to grow by **>50%**

Microsoft for Energy

Powering a sustainable future

Operate for the future

Increase reliability and recovery rates, and decrease variability of your operations, reducing environmental impact while generating value for stakeholders

Transition to clean

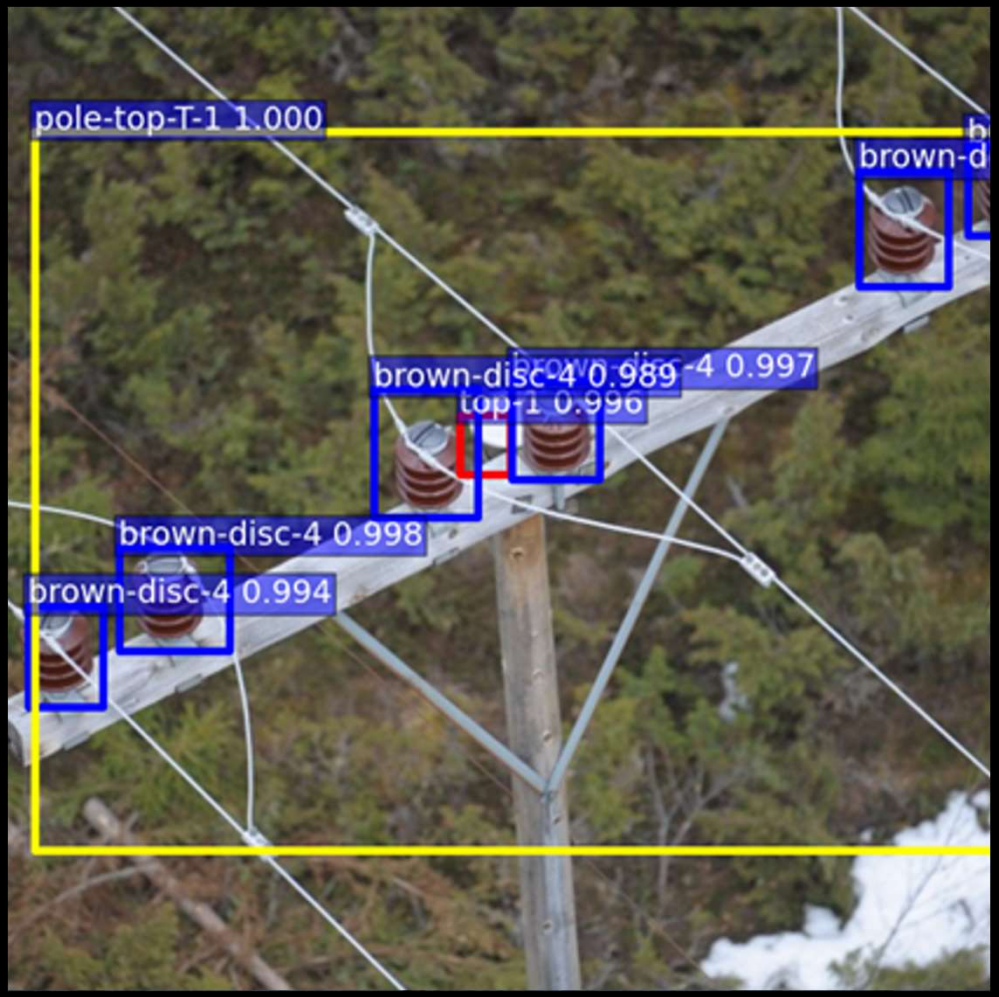
Keep people, products, and the world moving, while realizing reductions in carbon emissions and intelligently fulfilling demand with new renewable energy sources

Transform your workforce

Attract, train, and retain your next generation workforce, equipping them with the skills and technologies to drive your transformation to sustainable energy operator and service provider

Reimagine energy

Shape the future of energy beyond power generation and distribution with innovations in smart cities, infrastructure, vehicles and homes, and energy services



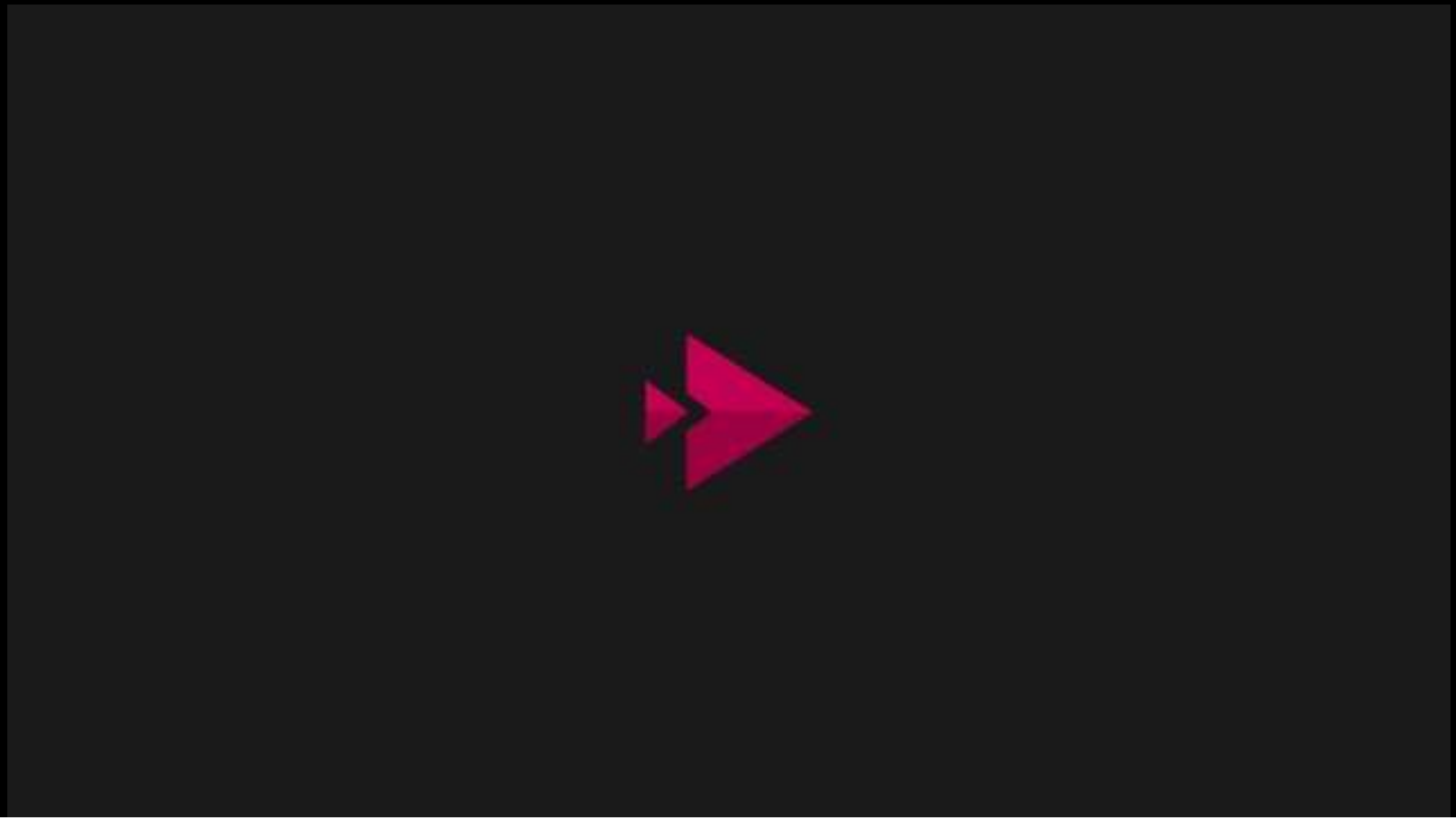
eSmart SYSTEMS

"We're providing the brains of the smart grid…. We're using a lot of different Microsoft Azure technologies, including Azure Machine Learning, but the core solution is to help operators predict issues to prevent blackouts."

Knut Johansen, CEO

Computer vision to identify defects

Unlock latent data with cognitive services



Computer vision to detect effluent

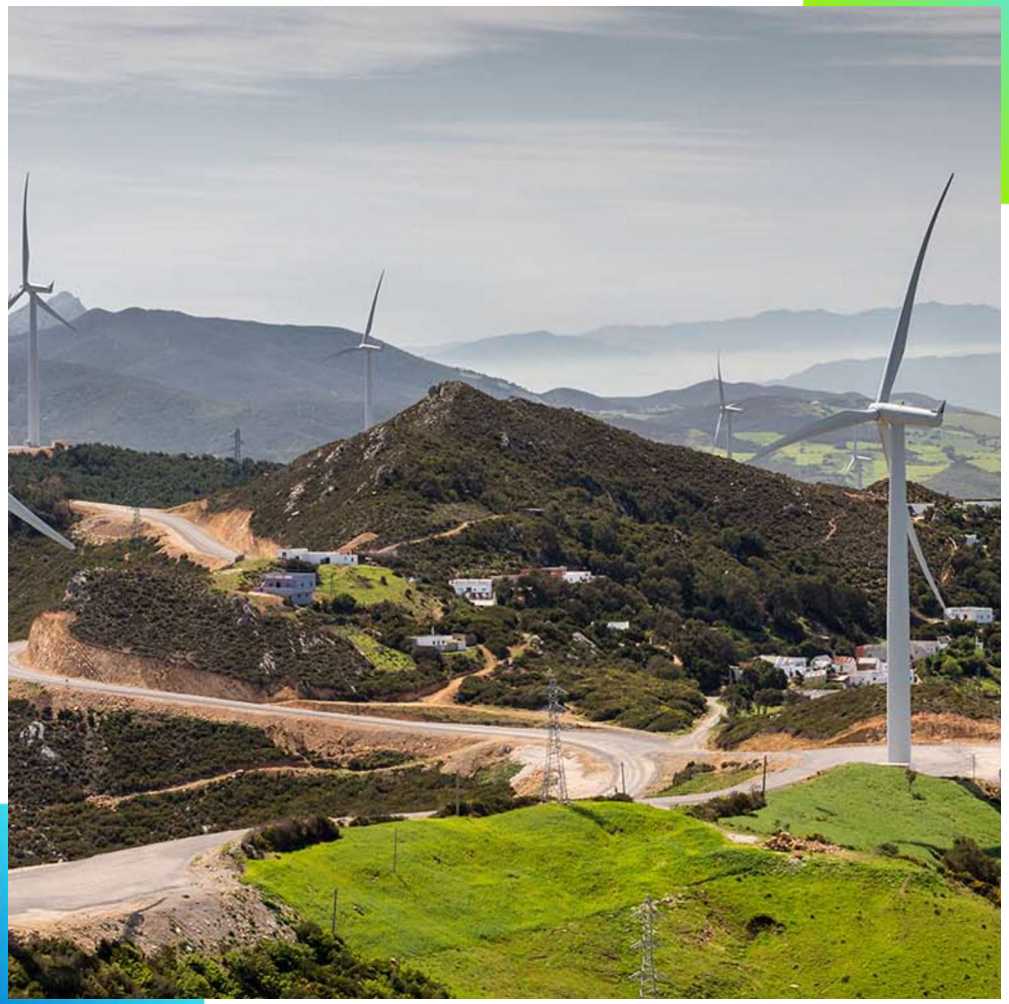
Minsur Azure Cognitive Services Custom Vision Case Study | Microsoft Learn

SIEMENS Gamesa
RENEWABLE ENERGY

Siemens-Gamesa creates a more sustainable future with wind power, AI, and the cloud

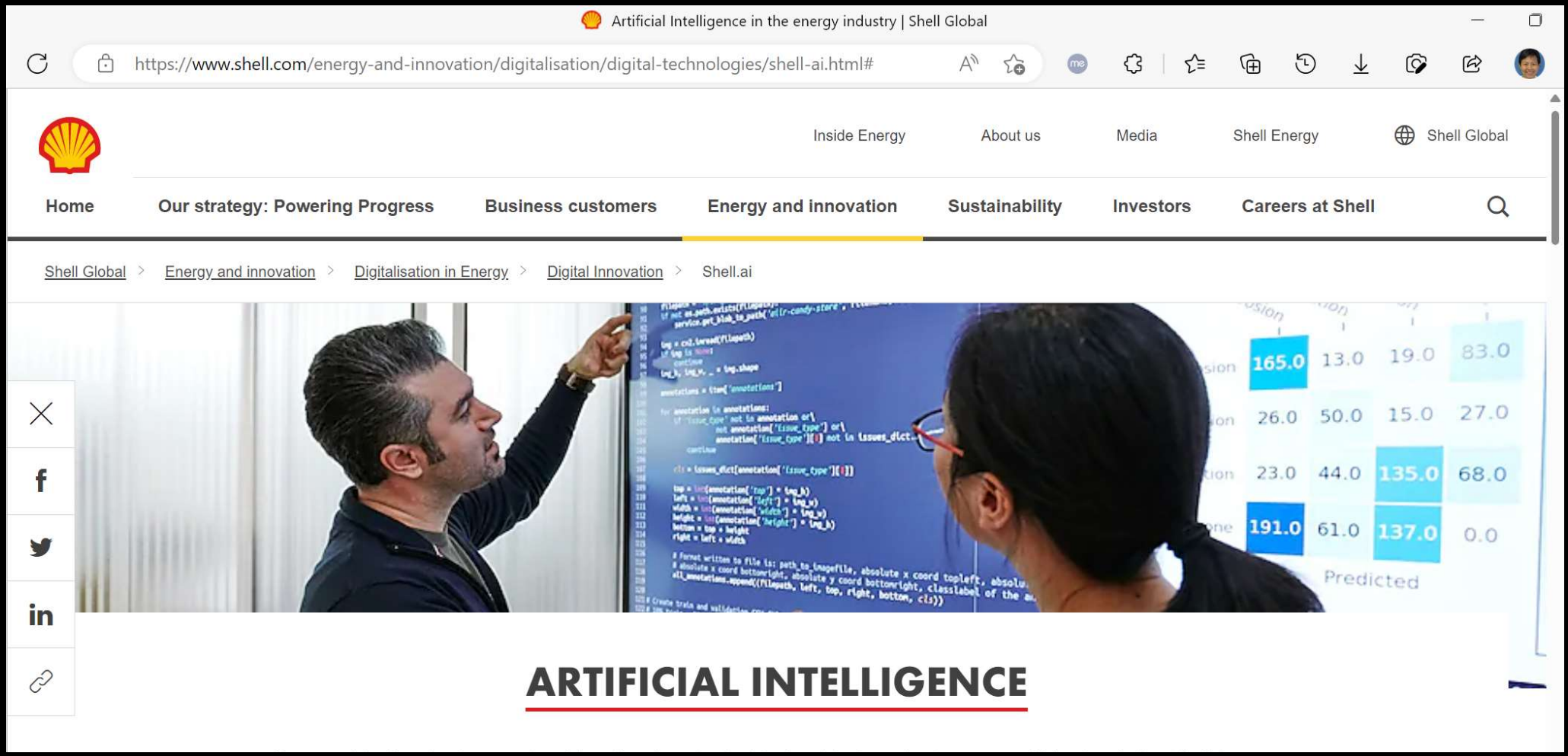
"To review all the photos is a huge task. The more we can make it an automated process, the easier it is for us to work with the data."

— Anne Katrine Karner-Gotfredsen
Manager Product integrity and warranty management



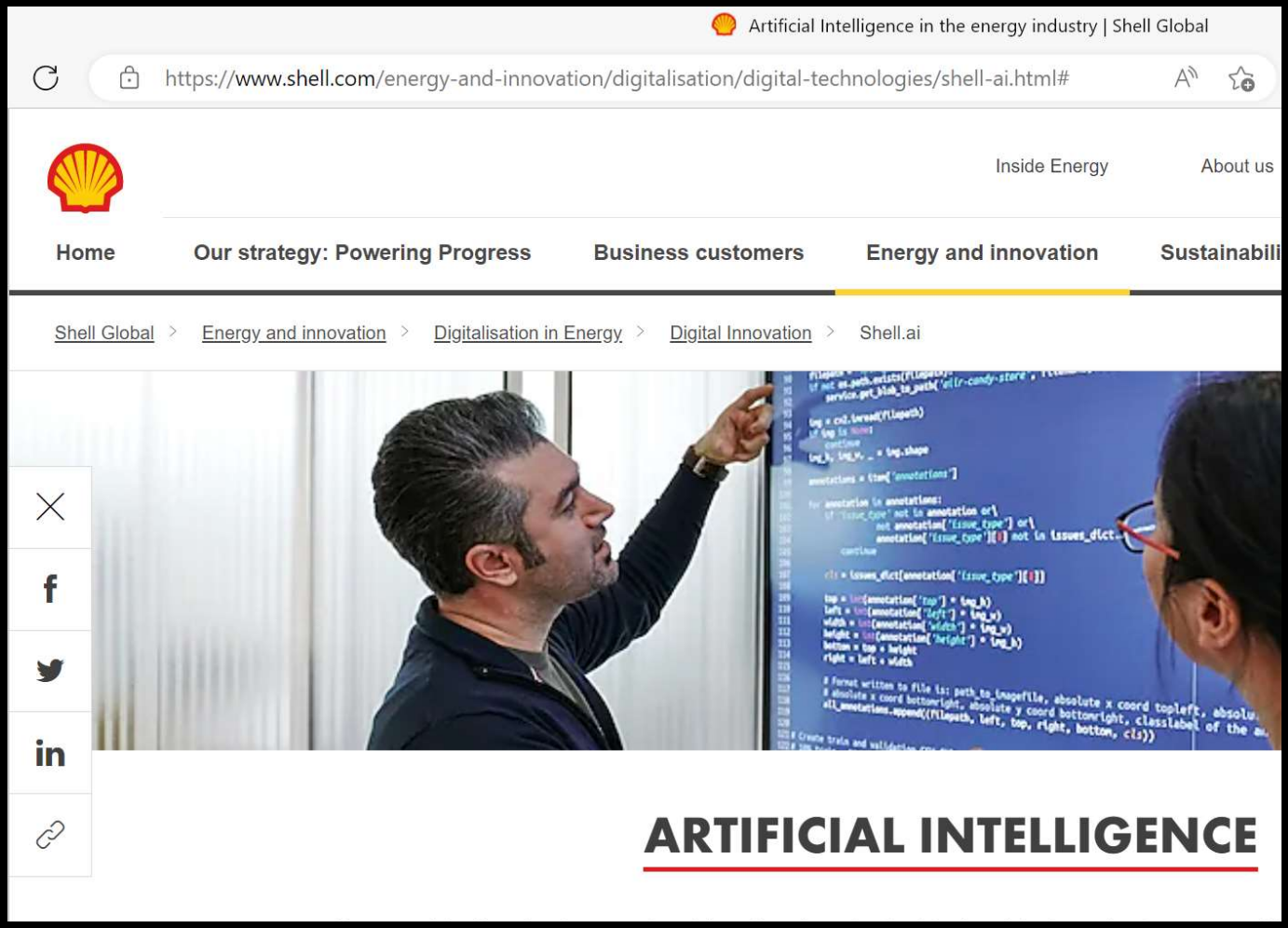
MICROSOFT CONFIDENTIAL

Predictive maintenance



What's happening at Shell is pretty amazing. They have a very deliberate strategy of using AI, right across their operation… from the drilling operations to safety in… Shell Retail stations.

Satya Nadella, Microsoft CEO



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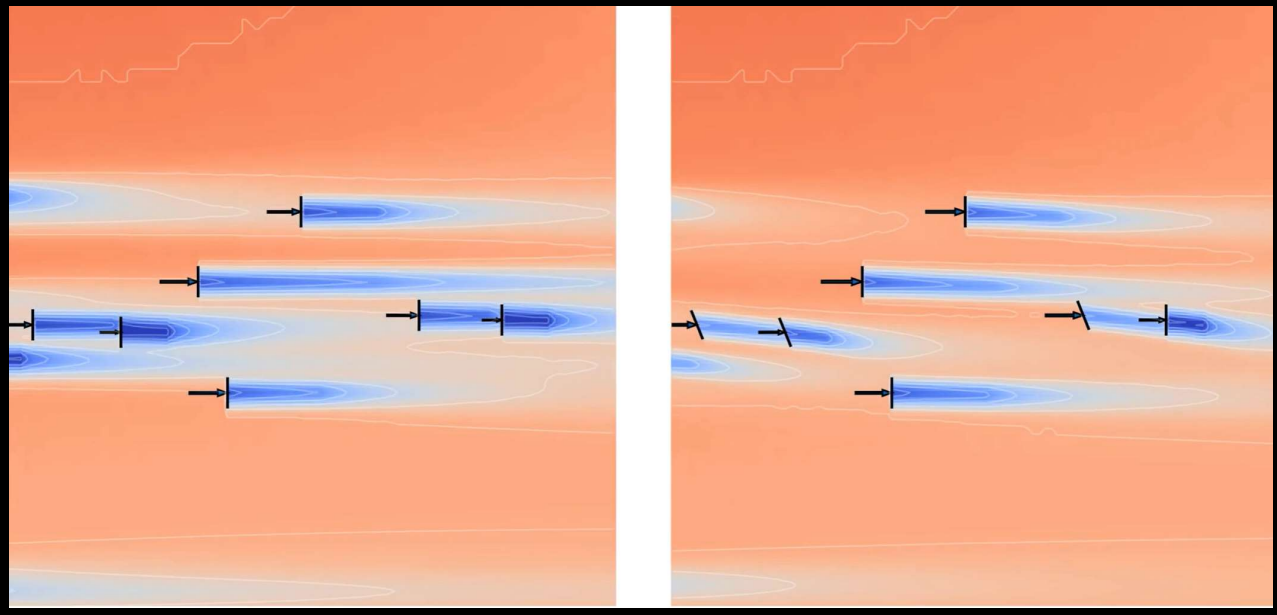
Satya Nadella, Microsoft CEO

AI in energy

- Automatically processes seismic data;
- Identifies predictive maintenance needs enabling facilities to run more efficiently;
- Optimise production processes through ongoing real-time optimisation routines;
- Identifies anomalies within the facilities using machine vision;
- Using IoT sensors to detect the quality of lubricants ;
- Providing better loyalty programs and offers for retail customers; and
- Optimising the charging experience of electric mobility customers – making it cheaper and greener.

Vestas supercharges its wind farm control models for sustainable energy with Azure HPC



Wind farm control

Vattenfall and Microsoft

Industry-first, 'ZeroGen'
+ 180MW wind PPA in the Netherlands +
24/7 Azure IoT platform

Press release • 2019-11-20 07:00

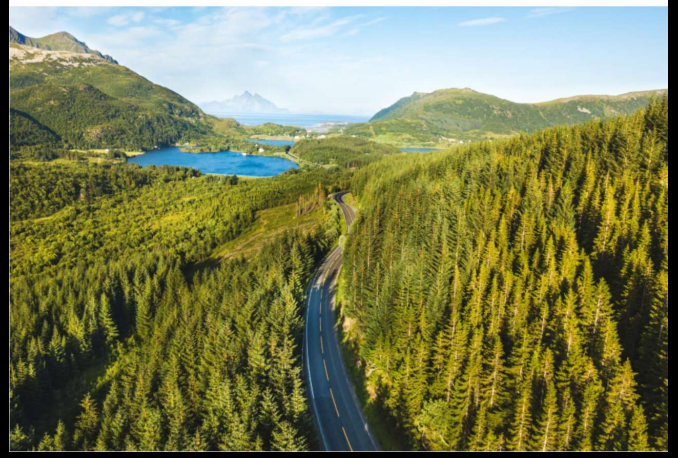
#technology #climatesmarter

Vattenfall and Microsoft pilot world's first hourly matching (24/7) of renewable energy

Vattenfall and Microsoft have jointly developed a first-of-its-kind solution, providing customers a new level of transparency into their electricity consumption making it possible to go from year-based data to hourly based data on source of origin. The solution, 24/7 Matching, is being piloted at Vattenfall and Microsoft Headquarters in Sweden.

Building for the future: Microsoft's new Swedish datacentres have sustainability firmly in mind

29/05/2019 | Esat Dedezade



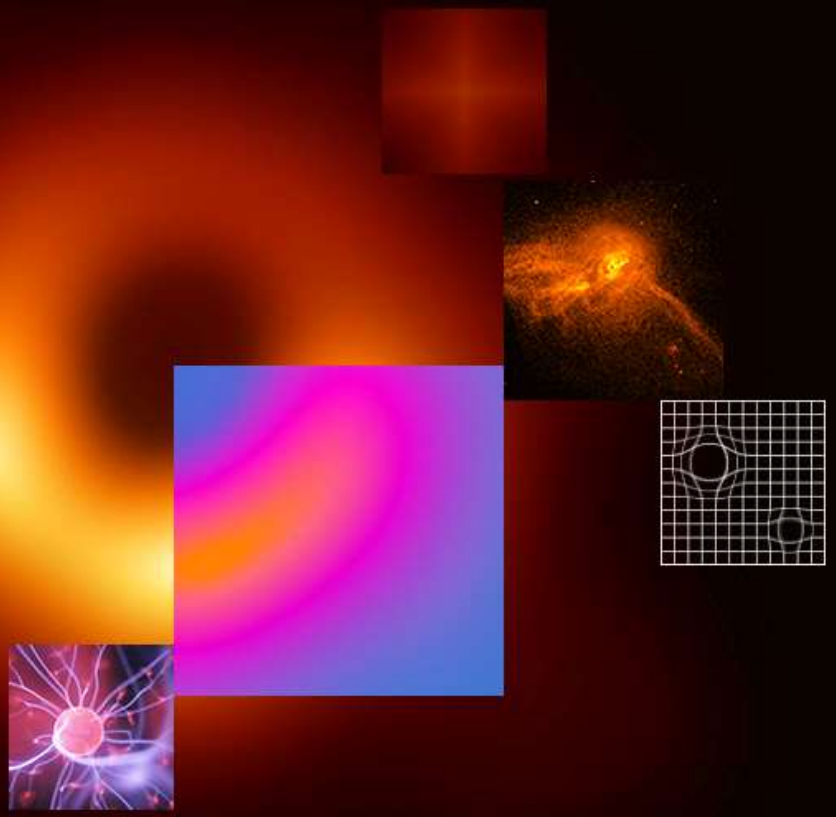
24/7 Matching

Project Bonsai

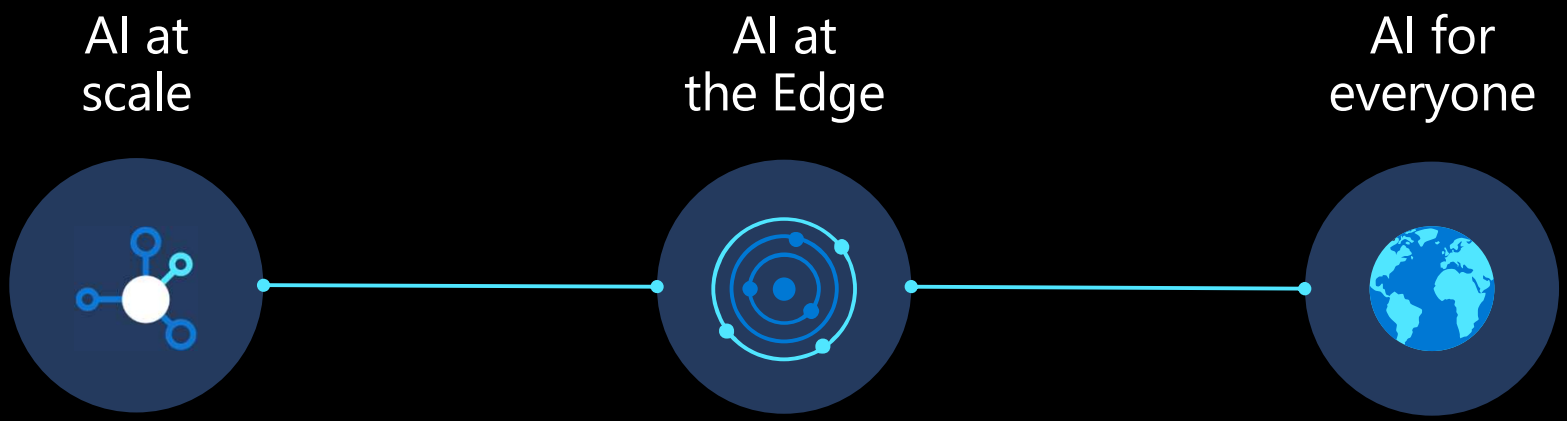
Project Bonsai

2

Reimagine what's possible



Reimagine what's next with AI



Reimagine AI at Scale

Microsoft Research + (Azure AI Supercomputer + Massive AI models) = AI at scale

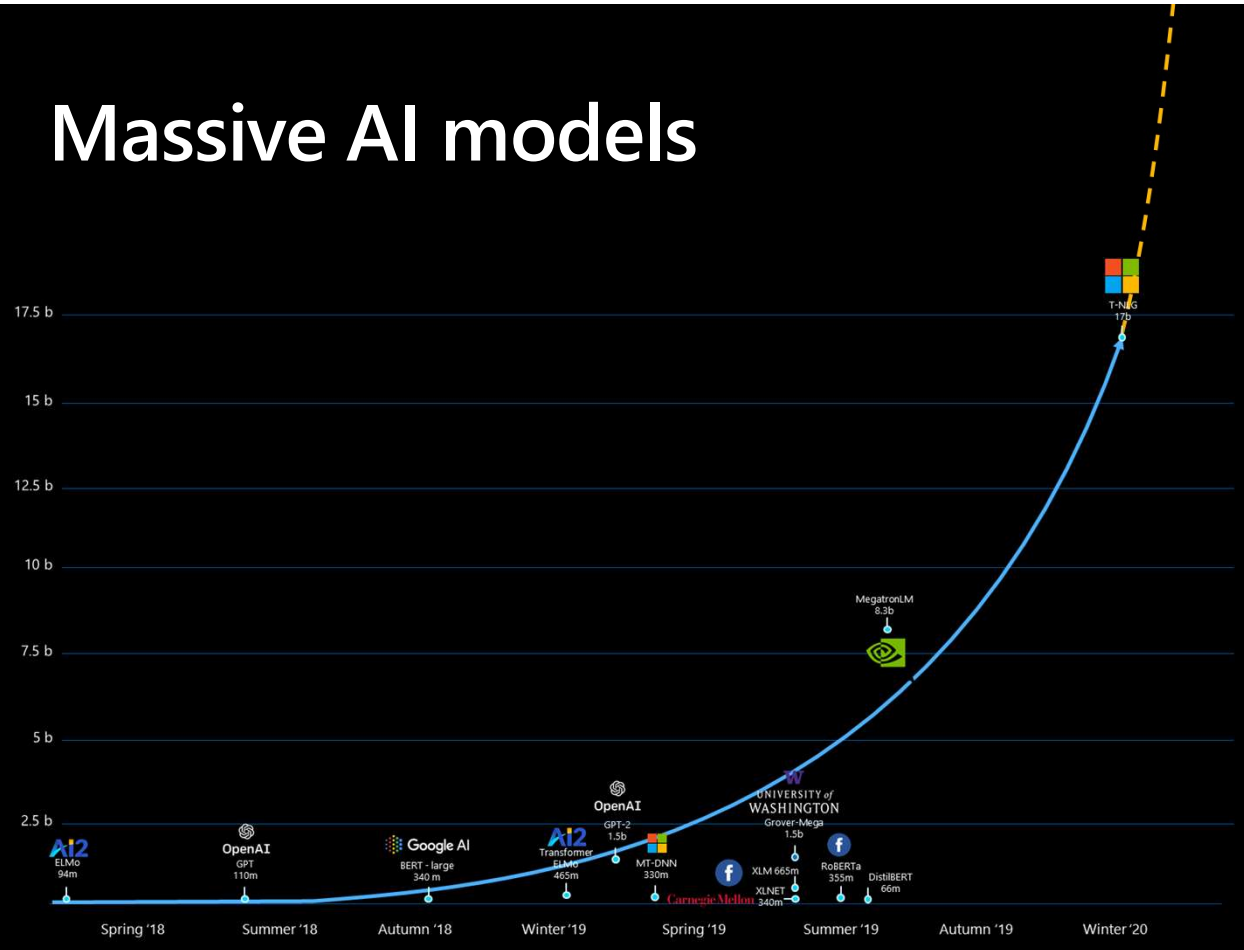
Massive AI models

Microsoft Turing:
Largest AI model ever built
(17B parameters)

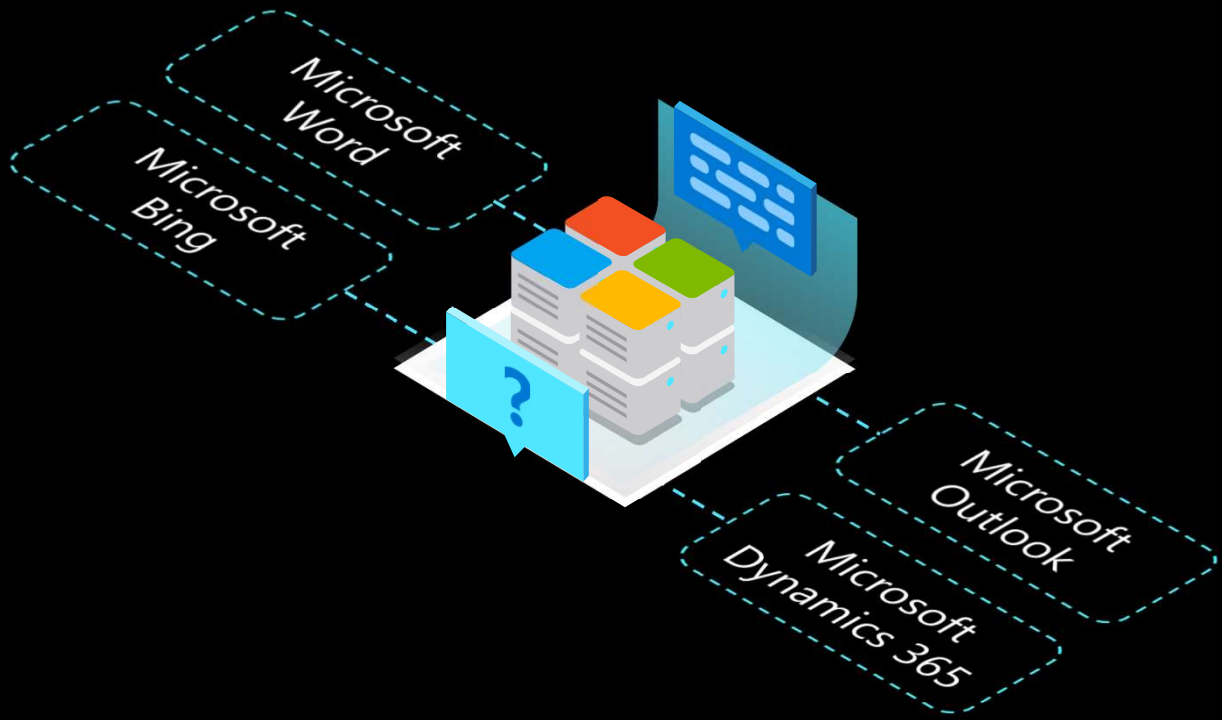
Changing how AI is developed:
from narrow, custom models
to multi-purpose, customized,
massive models

Turing language:
most powerful model for multi-task
natural language processing

The road of generalization:
Multi-modality text/images/video



How we use these models



How you can use these models, too

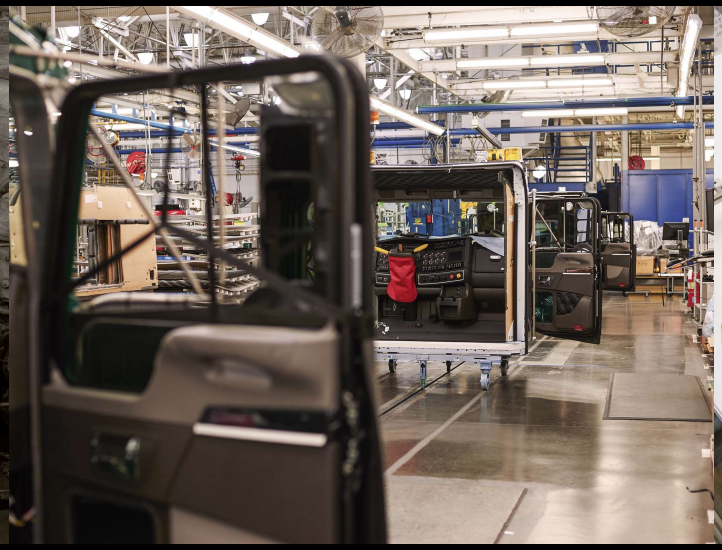
Reimagine AI at the edge

Mechanized systems

Powered by
steam or electricity

Manually operated

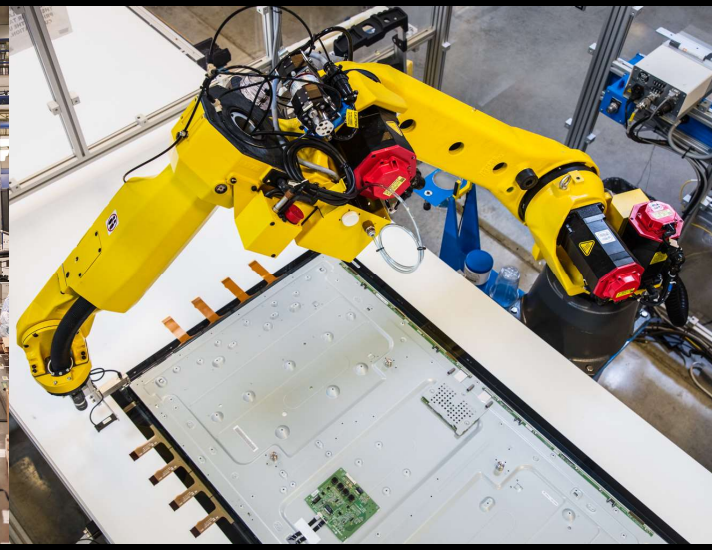
Automated systems



Powered by
software

Fixed operation

Autonomous systems



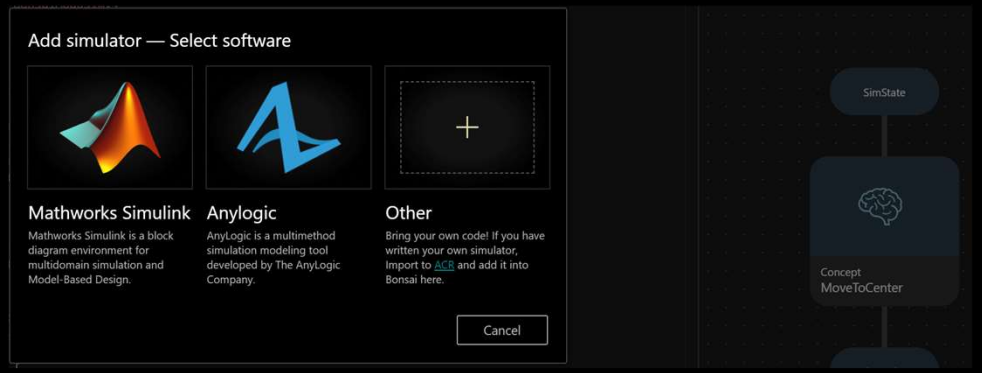
Powered by
AI

Intelligent operation
(sense/plan/act)

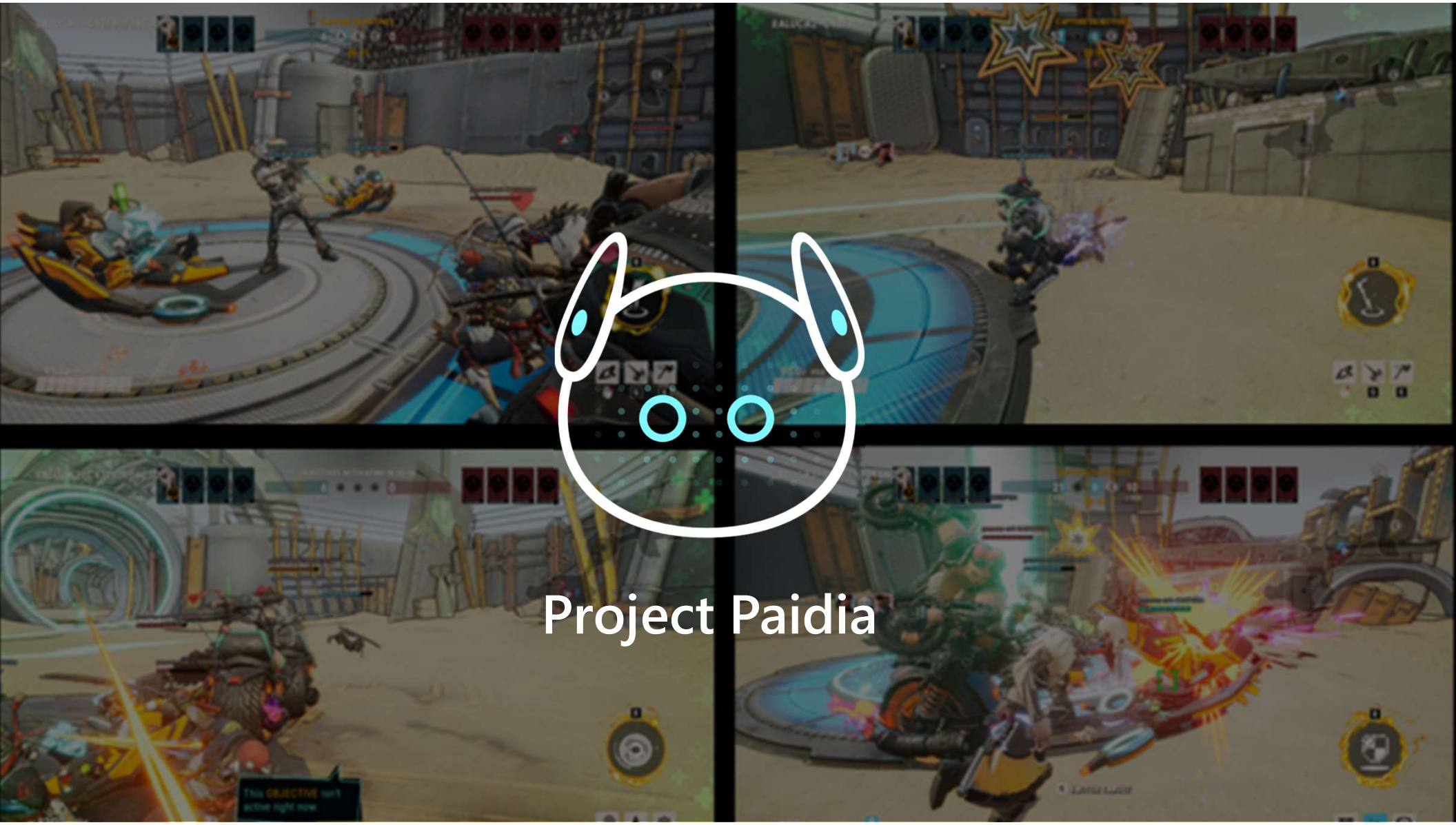
Machine teaching +simulations

Empowering Developers and Engineers to teach autonomous systems

Teaching concepts	Machine Teaching
Conceptual Progression	Concept decomposition
Progressive Difficulty	Curriculum learning
Analogies	Transfer Learning
Demonstration	Apprenticeship learning
Praise and Criticism	Augmented reward signals
Student Feedback	Training Visualizations
Active Student Participation	Hints and Advice to Teacher



Bell Autonomous System

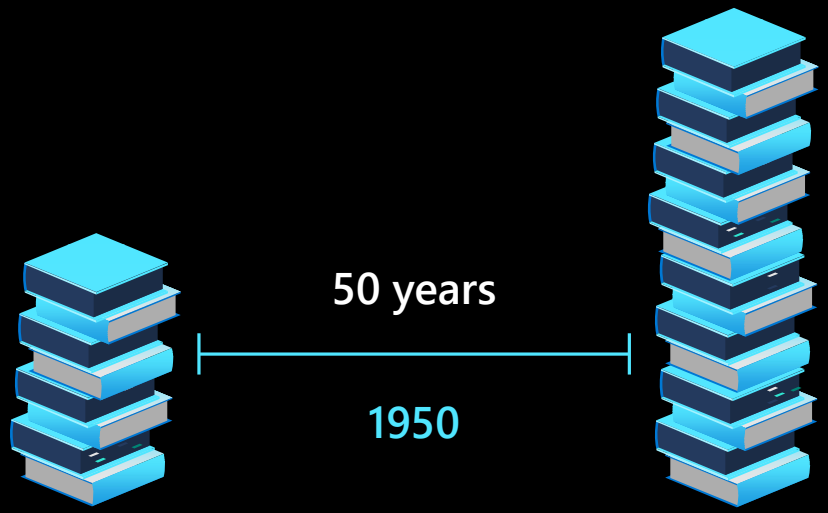

Project Paidia

AI for everyone

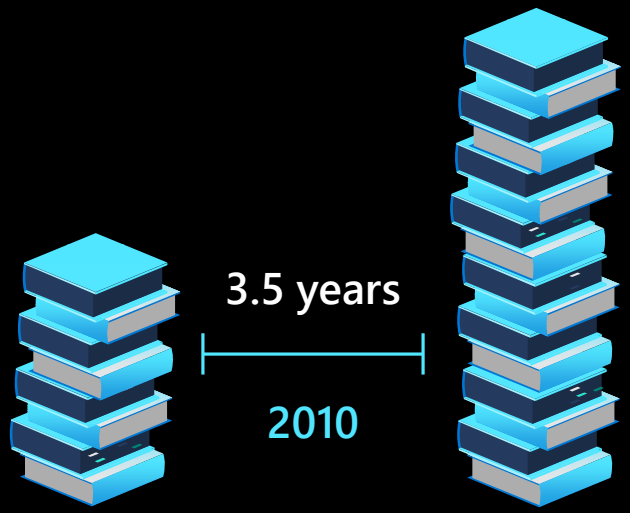
The **promise of AI becomes real** when it is put in the hands of subject matter experts to uncover hidden insights

To transform how we work, how we collaborate, and how we find meaning faster and with more accuracy

Medical knowledge doubling speed



Medical knowledge doubling speed



Medical knowledge doubling speed

AI breakthroughs in Biomedical Research

Biomedical NLP

NOVARTIS

Customer:
Novartis

Industry:
Healthcare

Size:
Corporate (10,000 + employees)

Country:
United States

Products and services:
Azure Cognitive Services

Read full story here

Situation

The company wanted a way to bring the power of AI to the desktop of every employee—not just data scientists and developers—with a goal of transforming how medicines are discovered, manufactured, and commercialized

Solution

By putting AI in the hands of every Novartis associate, they'll be able to reason over Novartis' vast quantities of unstructured pharmaceutical information to take on the next wave of challenges in medicine

Impact

Novartis scaled AI to a majority of their 50K employees to help them quickly derive insights and transform how medicines are discovered, manufactured, and commercialized

Microsoft Research

Turning ideas into reality for 29 years

8 MSR Labs

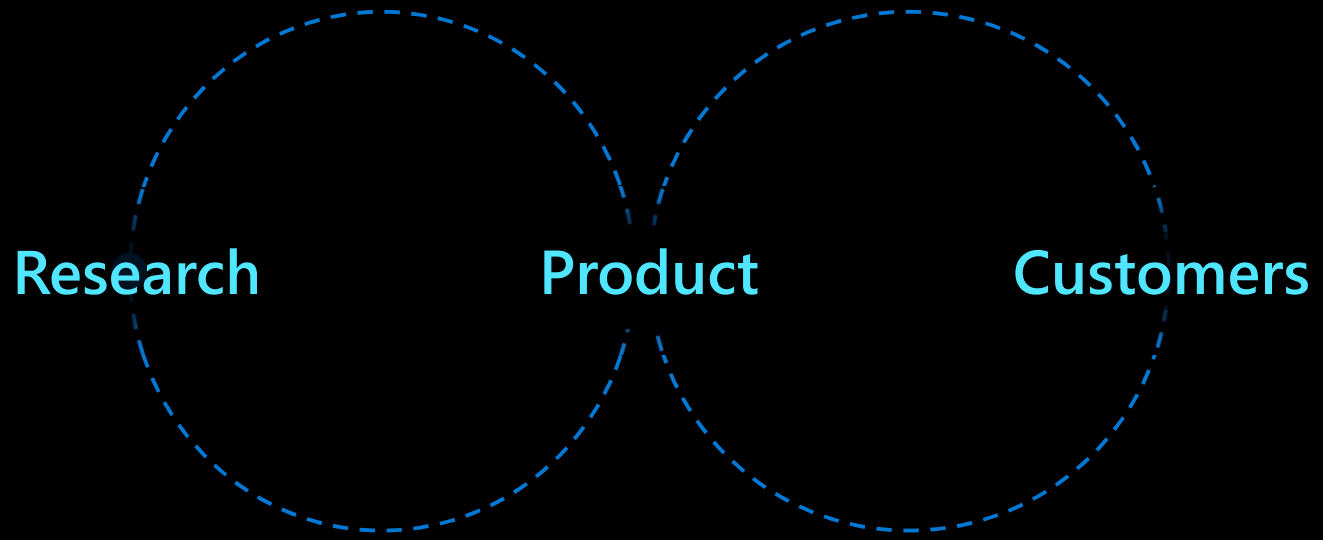
1k+ Researchers

20+ Fields

4k+ WW Patents

22k+ Papers

How we approach innovation

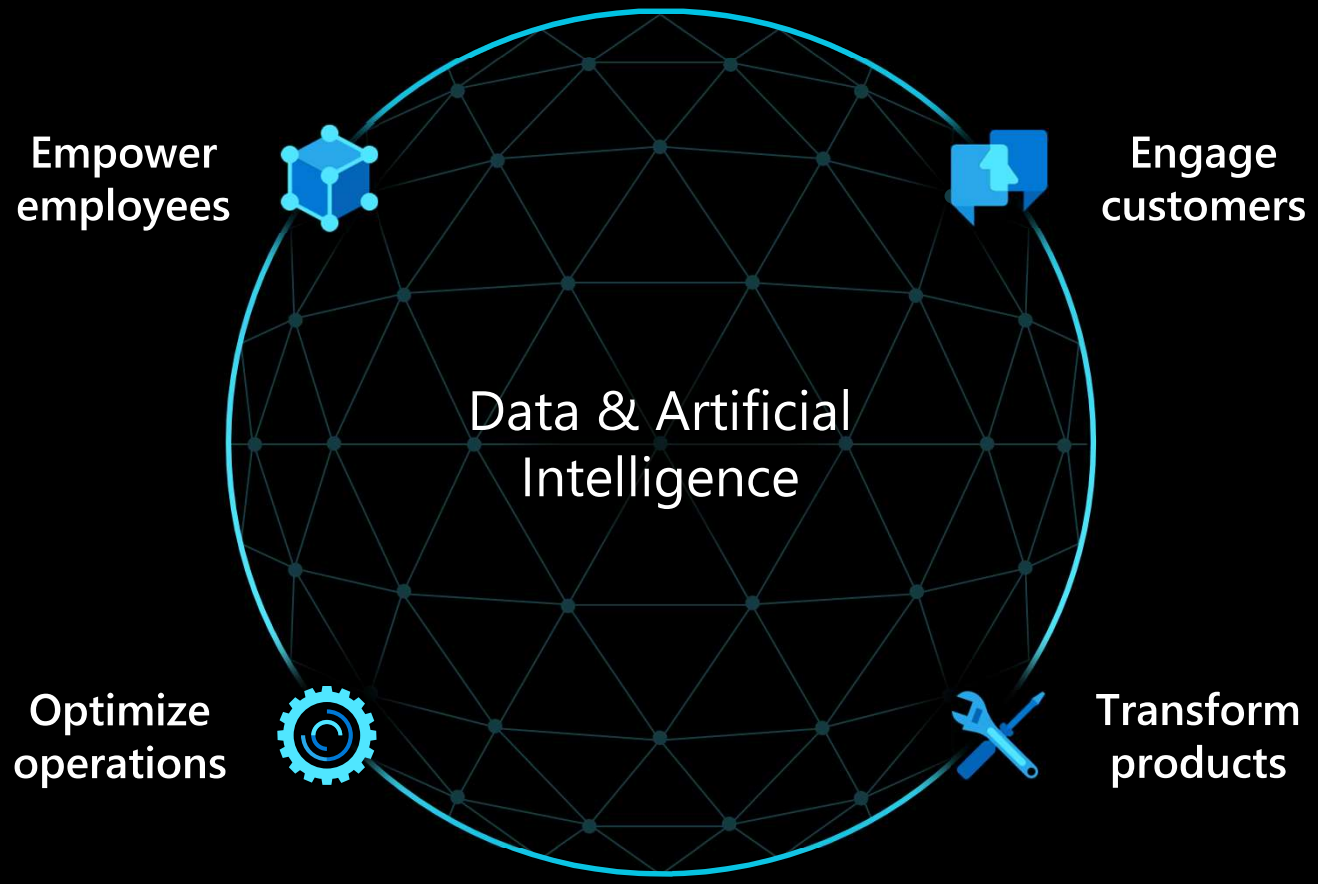


Innovation culture and an innovation architecture create a continuous innovation loop that enables us to translate our creative energy into business results.

3

An actionable start

Digital Feedback Loop



Bridge today *and* tomorrow with Microsoft AI

1

Put AI into action

Make it meaningful

Empower everyone

Act responsibly

2

Respond today with AI

Solve today's challenges

Lay a foundation for what's next

3

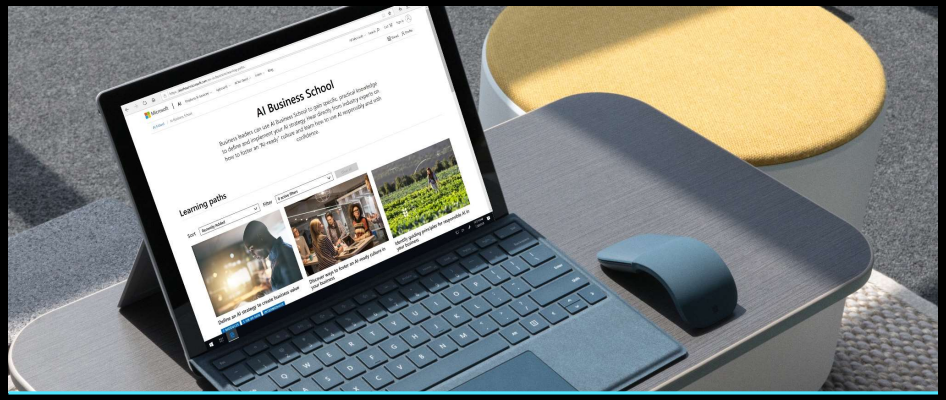
Reimagine what's possible

AI at scale

AI for every employee and skill level

From automation to autonomous

AI Business School



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