"We can't always choose the music life plays for us, **but we can choose how we dance to it**"

Microsoft

How many people feel that AI, ChatGPT, Open AI, Generative AI is for real?

Microsoft

The Promise of AI

Fighting Canada's record wildfires with a combination of AI and intuition

How a small city in Iowa became an epicenter for advancing AI

AI may hold a key to the preservation of the Amazon rainforest

With help from next-generation AI, Indian villagers gain easier access to government services

Assisted by AI, a workforce of bees tracks pollution and boosts biodiversity

Generative AI tools are helping people with listening difficulties in Japan

Time to
100 million users

Cell phone
16 years

Internet
7 years

ChatGPT
3 months

Microsoft

The Power of the Individual

Microsoft

Early Access Program Survey Results

All Up Value
70% are more **productive**

68% improved the **quality of their work**

37% feel more **fulfilled at work**

71% spend less time on **mundane tasks**

Value by Workflow
64% spend less time **processing email**

75% spend less time searching for **information in their files**

84% find it easier to **take action after a meeting**

3.8x faster at catching up on **missed meetings**

85% get to a good **first draft faster**

Value by Role / Function
79% reduced their **administrative workload**

68% keep their CRM **up to date with less effort**

67% spend more time with their **customers**

64% better personalize customer **engagements**

How much is Copilot worth to users?

77% **Choose Copilot over free lunch**

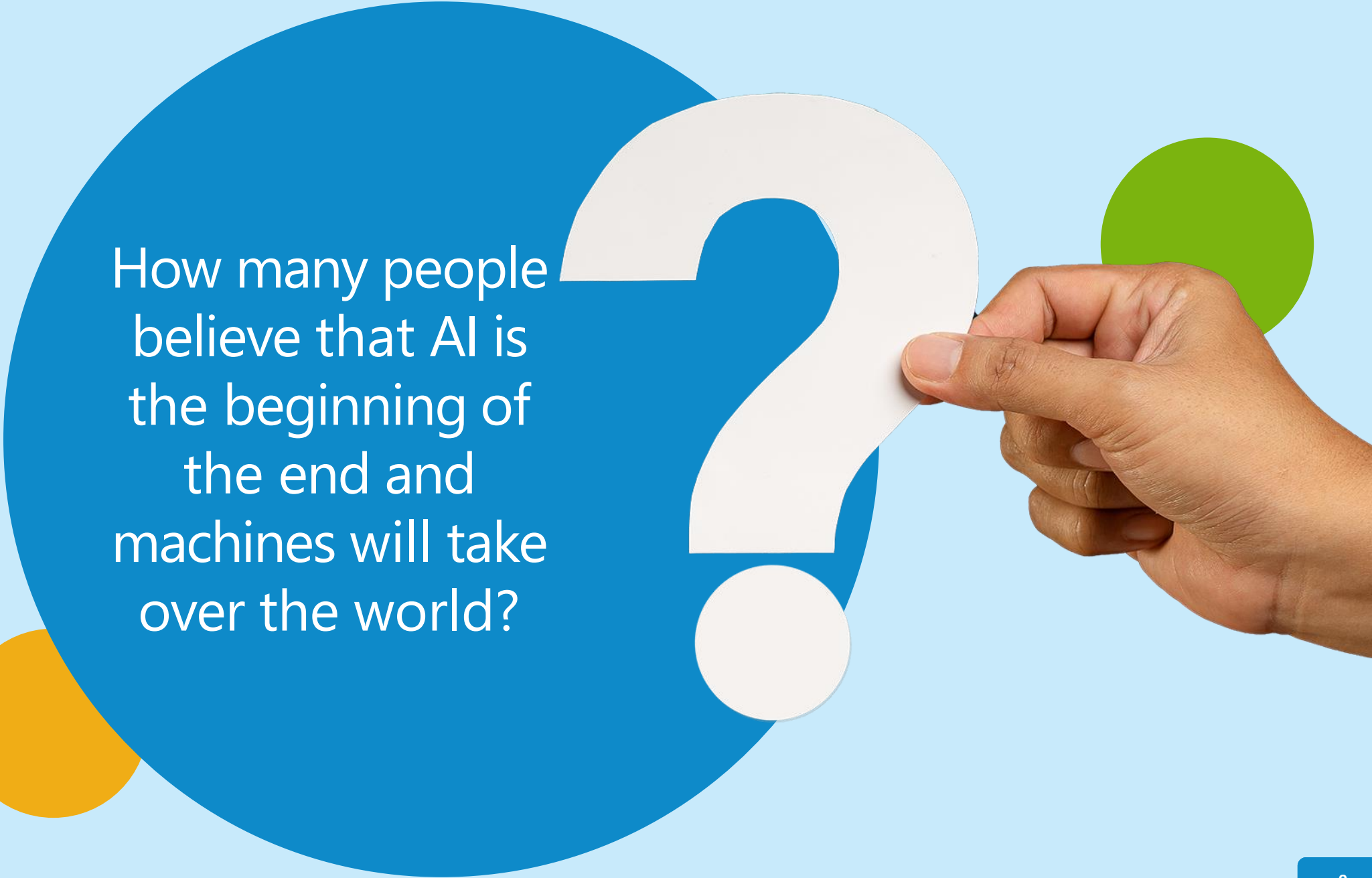**77%** Would not want to go back to **working without Copilot**

30% Access to Copilot would influence my **choice of employer**
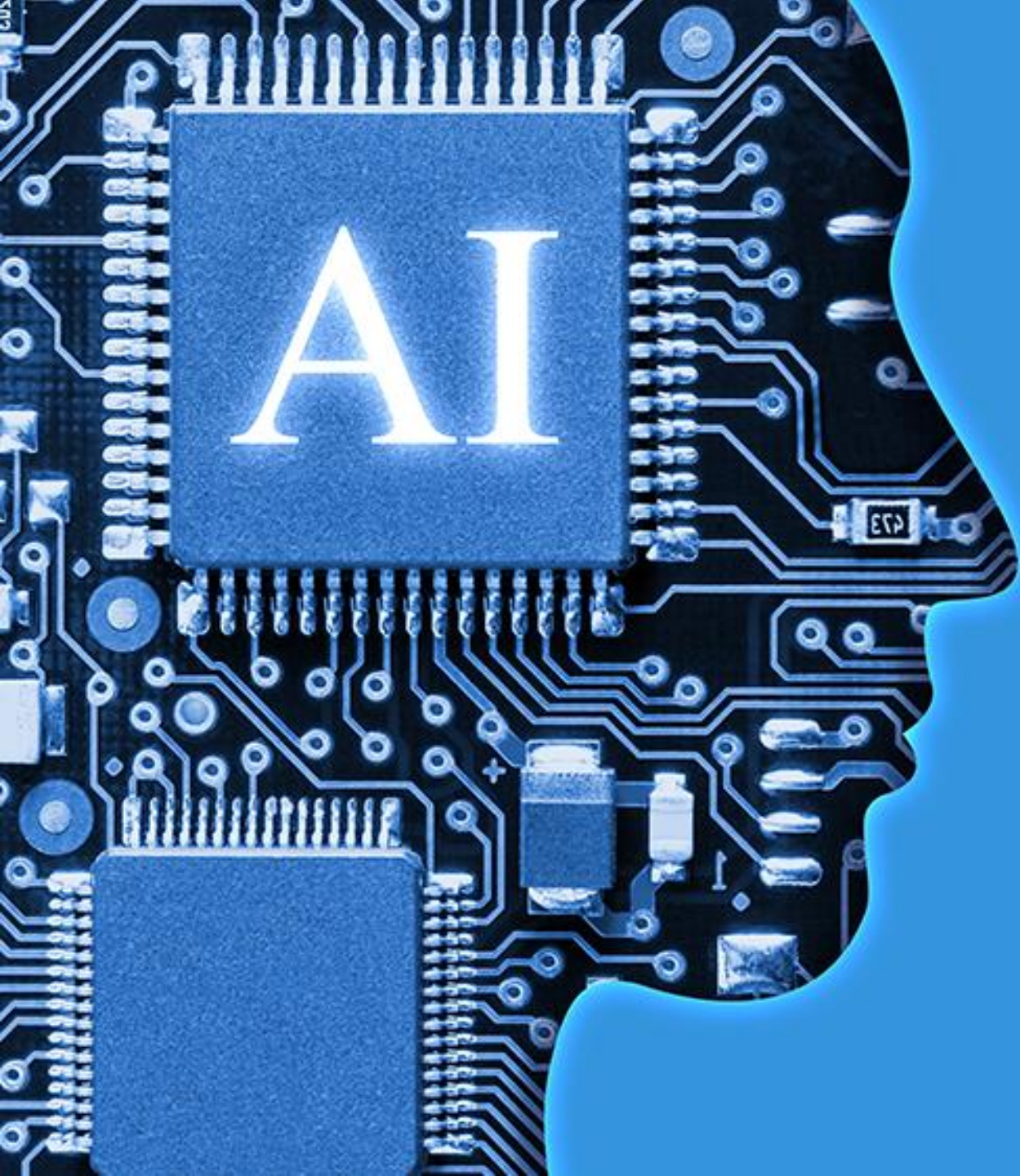
We don't expect humans to be perfect but we **Expect AI to be**

AI is only as good as the **data it can access**

How many people believe that AI is the beginning of the end and machines will take over the world?

We need to design the governance around responsible AI
before the government tells us how to do it...

Alignment of our efforts with the White House Voluntary AI Commitments

Safe

White House Voluntary AI commitments

Companies choose to conduct red-teaming, share trust and safety information, and help people identify AI-generated content

Microsoft commitments

- Test our systems using red-teaming and systematic measurements
- Contribute to industry efforts to develop evaluation standards for emerging safety and security issues
- Implement provenance tools to help people identify AI-generated audio or visual content
- Implement the NIST AI Risk Management Framework
- Implement robust reliability and safety practices for high-risk models and applications

Secure

White House Voluntary AI commitments

Companies choose to make investments to protect unreleased model weights, and incent the responsible disclosure of AI system vulnerabilities

Microsoft commitments

- Ensure that the cybersecurity risks of our AI products and services are identified and mitigated
- Participate in an approved multi-stakeholder exchange of threat information
- Support the development of a licensing regime for highly-capable models
- Support the development of an expanded "know your customer" concept for AI services

Trustworthy

White House Voluntary AI commitments

Companies choose to be transparent about system capabilities and limitations, prioritize research on societal risks, and develop and deploy AI systems for the public good

Microsoft commitments

- Release an annual transparency report on the governance of our responsible AI program
- Design our AI systems so that people know when they are interacting with an AI system and be transparent about system capabilities and limitations
- Increase investment in academic research programs
- Collaborate with the National Science Foundation to explore a pilot project to stand up the National AI Research Resource
- Support the development of a national registry of high-risk AI systems

With each great innovation wave there has been backlash

Early 1800's, 80% of the population
farmed then the plow, cotton gin etc

What will we do?

1870 Edison first light bulb or lamp is revealed

You will burn down cities!

1907 Henry Ford's first model T rolled off
the assembly line

You will never replace the Horse!

The Radio

People will stop reading!

The Telephone

What do you need a telephone for just walk down the street
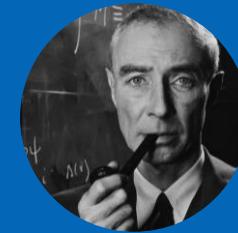
It's the Devil!

The TV

You have a radio!

Oppenheimer

Elvis Presley

Viva Las Vegas!

The Mainframe Computer

The PC and Laptops

Email, Cell Phones and Social Media

Artificial Intelligence

Microsoft

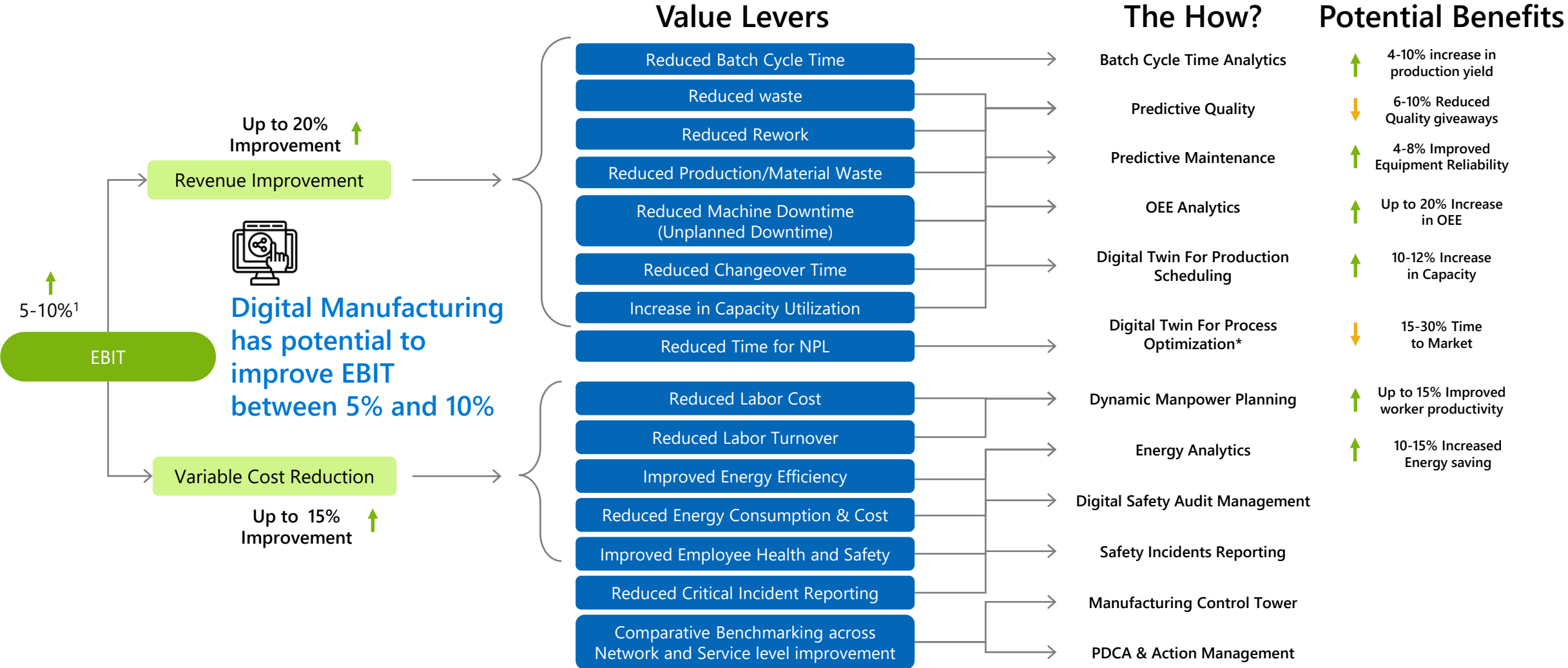# The last best experience

that anyone has anywhere becomes

the minimum expectation they want everywhere

Microsoft

Enabling Business Results with
AI and Digital Twins

Microsoft

Applying AI and digital capabilities to achieve transformative results

Value Levers

The How?	Potential Benefits

EBIT 5-10%[1]

Revenue Improvement — Up to 20% Improvement

Digital Manufacturing has potential to improve EBIT between 5% and 10%

Variable Cost Reduction — Up to 15% Improvement

Value Levers (Revenue Improvement)
- Reduced Batch Cycle Time
- Reduced waste
- Reduced Rework
- Reduced Production/Material Waste
- Reduced Machine Downtime (Unplanned Downtime)
- Reduced Changeover Time
- Increase in Capacity Utilization
- Reduced Time for NPL

Value Levers (Variable Cost Reduction)
- Reduced Labor Cost
- Reduced Labor Turnover
- Improved Energy Efficiency
- Reduced Energy Consumption & Cost
- Improved Employee Health and Safety
- Reduced Critical Incident Reporting
- Comparative Benchmarking across Network and Service level improvement

The How?
- Batch Cycle Time Analytics
- Predictive Quality
- Predictive Maintenance
- OEE Analytics
- Digital Twin For Production Scheduling
- Digital Twin For Process Optimization*
- Dynamic Manpower Planning
- Energy Analytics
- Digital Safety Audit Management
- Safety Incidents Reporting
- Manufacturing Control Tower
- PDCA & Action Management

Potential Benefits
- 4-10% increase in production yield
- 6-10% Reduced Quality giveaways
- 4-8% Improved Equipment Reliability
- Up to 20% Increase in OEE
- 10-12% Increase in Capacity
- 15-30% Time to Market
- Up to 15% Improved worker productivity
- 10-15% Increased Energy saving

Applying AI and digital capabilities to achieve transformative results in Manufacturing Plants

Sustainability
15-25% Reduction in energy usage

Production
4-10% Uptick in production yield

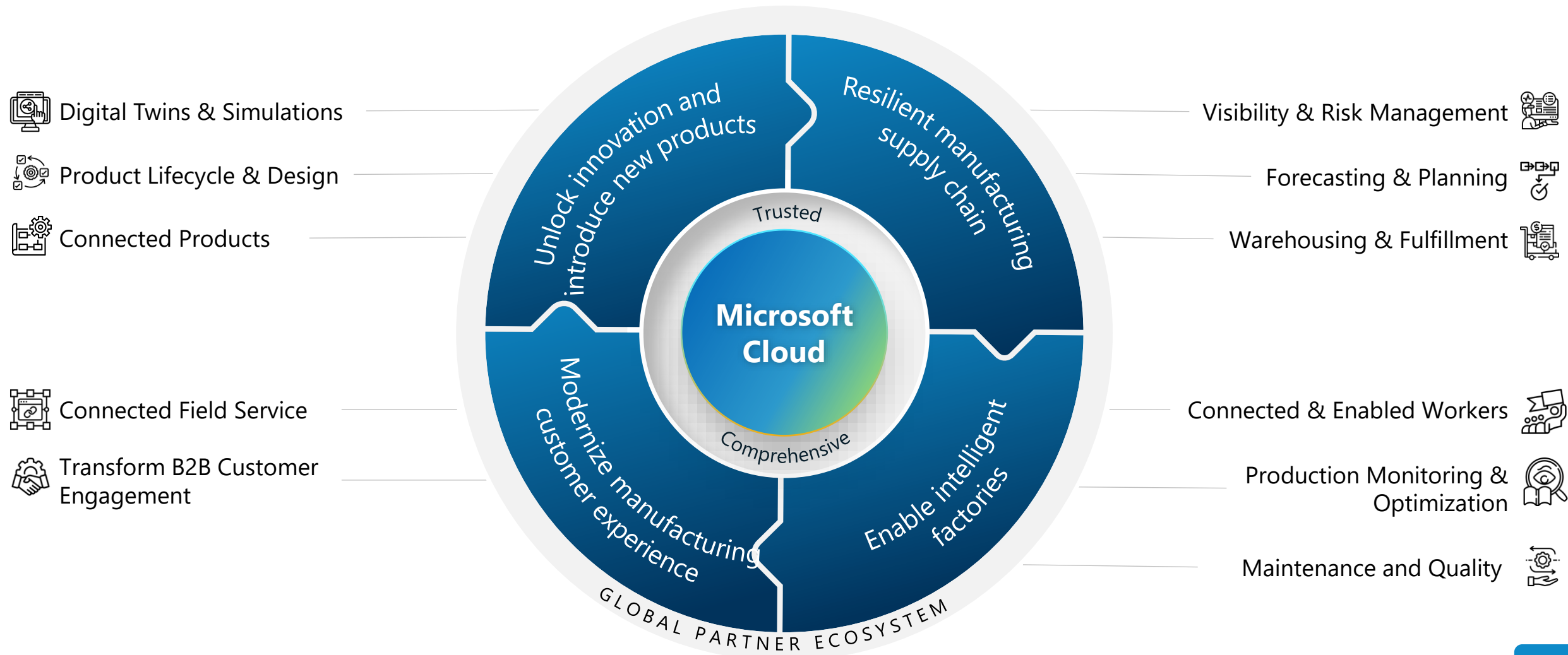**People**
15% increase in worker productivity

Waste
6-10% reduction in waste

Microsoft

AI Technology in Manufacturing

Unlock innovation, optimize operations, empower workers, and enhance the customer experience
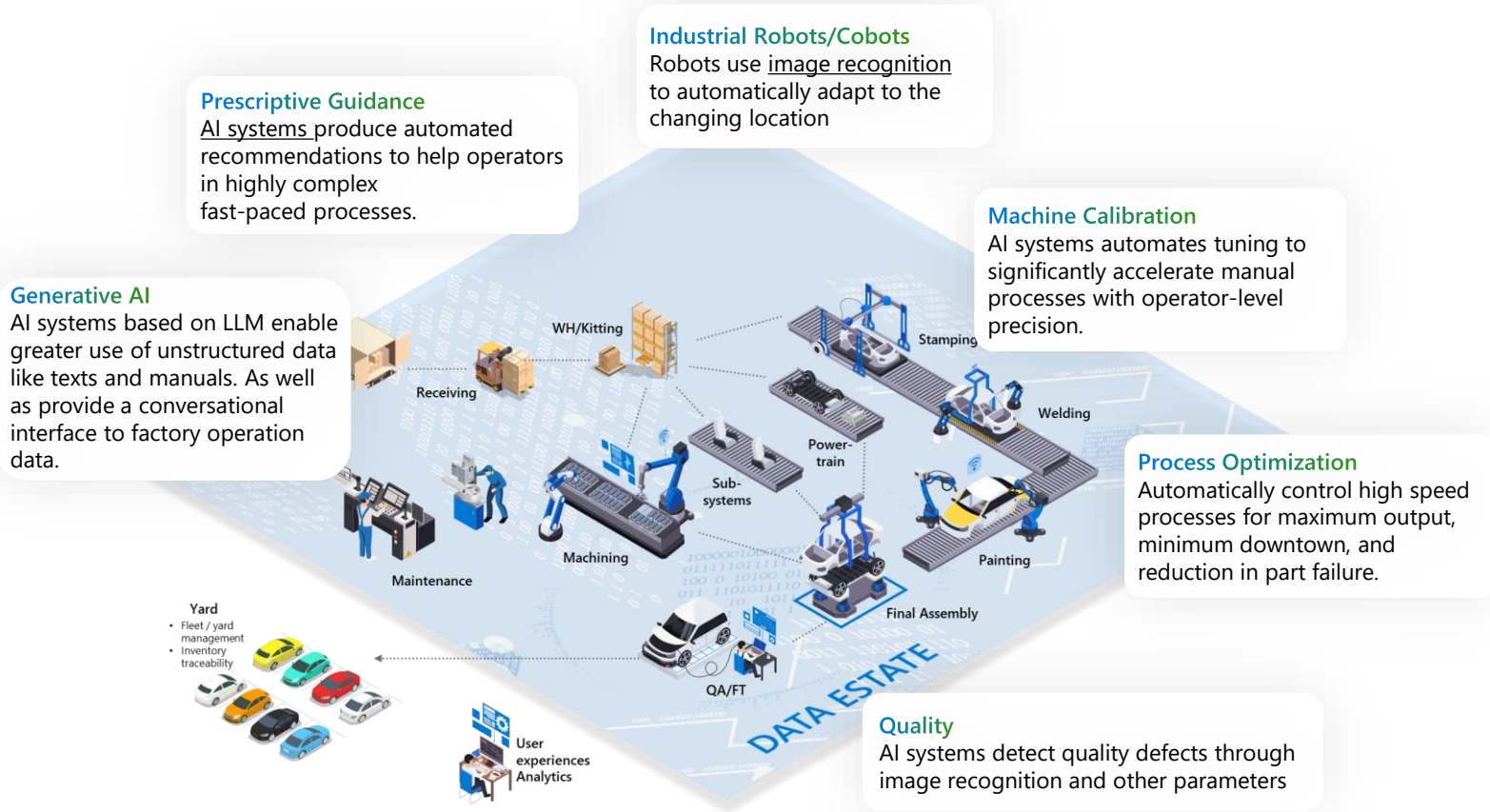

Digital Twins & Simulations

Product Lifecycle & Design

Connected Products

Connected Field Service

Transform B2B Customer Engagement

Unlock innovation and introduce new products

Resilient manufacturing supply chain

Trusted

Microsoft Cloud

Comprehensive

Modernize manufacturing customer experience

Enable intelligent factories

GLOBAL PARTNER ECOSYSTEM

Visibility & Risk Management

Forecasting & Planning

Warehousing & Fulfillment

Connected & Enabled Workers

Production Monitoring & Optimization

Maintenance and Quality

Microsoft

Using AI to Achieve Your Goals

Microsoft

How are you applying or thinking of applying AI to your construction challenges?

Microsoft

AI and Machine Intelligence in Automation

Prescriptive Guidance
AI systems produce automated recommendations to help operators in highly complex fast-paced processes.

Industrial Robots/Cobots
Robots use image recognition to automatically adapt to the changing location

Machine Calibration
AI systems automates tuning to significantly accelerate manual processes with operator-level precision.

Generative AI
AI systems based on LLM enable greater use of unstructured data like texts and manuals. As well as provide a conversational interface to factory operation data.

Process Optimization
Automatically control high speed processes for maximum output, minimum downtown, and reduction in part failure.

Quality
AI systems detect quality defects through image recognition and other parameters

WH/Kitting, Receiving, Maintenance, Machining, Sub-systems, Power-train, Stamping, Welding, Painting, Final Assembly, QA/FT, User experiences Analytics, DATA ESTATE

Yard
- Fleet / yard management
- Inventory traceability

Autonomous systems capabilities:

- **None:** No additional intelligence from machines

- **Advisory:** Machine provides insights, humans decide and act

- **Assistive:** Machine and humans work and act together

- **Autonomous:** Machine decides and acts independent of human

Capability Levels of Autonomous Things

None	Advisory	Assistive	Autonomous
1	2	3	4

Source: Garnter, Top 10 Strategic Technology Trends for 2019: Autonomous Things (March 2019)

Customers   Kawasaki Robotics   BMW   PEPSICO   NOV   SCG

AI Use cases in building facilities

Construction

- Site Planning and Analysis
- Building Information Modeling
- Autonomous excavation
- Prevention of cost overruns through use of historical data and subjective criteria
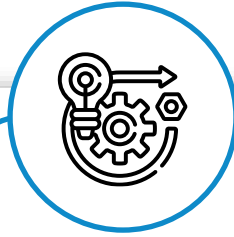
Plant Operations

- Intelligent remediation/ troubleshooting assistance
- Training guide creation
- SOP checklist creation
- Maintenance schedule creation
- Equipment guide summarization

EHS

- Scanning job sites for potential safety risks
- Checklist creation for EHS procedures
- Semantic search for safety docs
- Safety Bot – Always on response to safety issues

SIEMENS

SIGHT MACHINE

Rockwell Automation

Test within 30 seconds

Galaxy is an onsite rapid mycotoxin test using cutting-edge Artificial Intelligence enabled Hyperspectral Imaging.

Hyperspectral Camera

Galaxy

RESULTS

| DON | 2.1 PPM |
| AFLA | 22 PPB |

Mycotoxin

Sample Tray
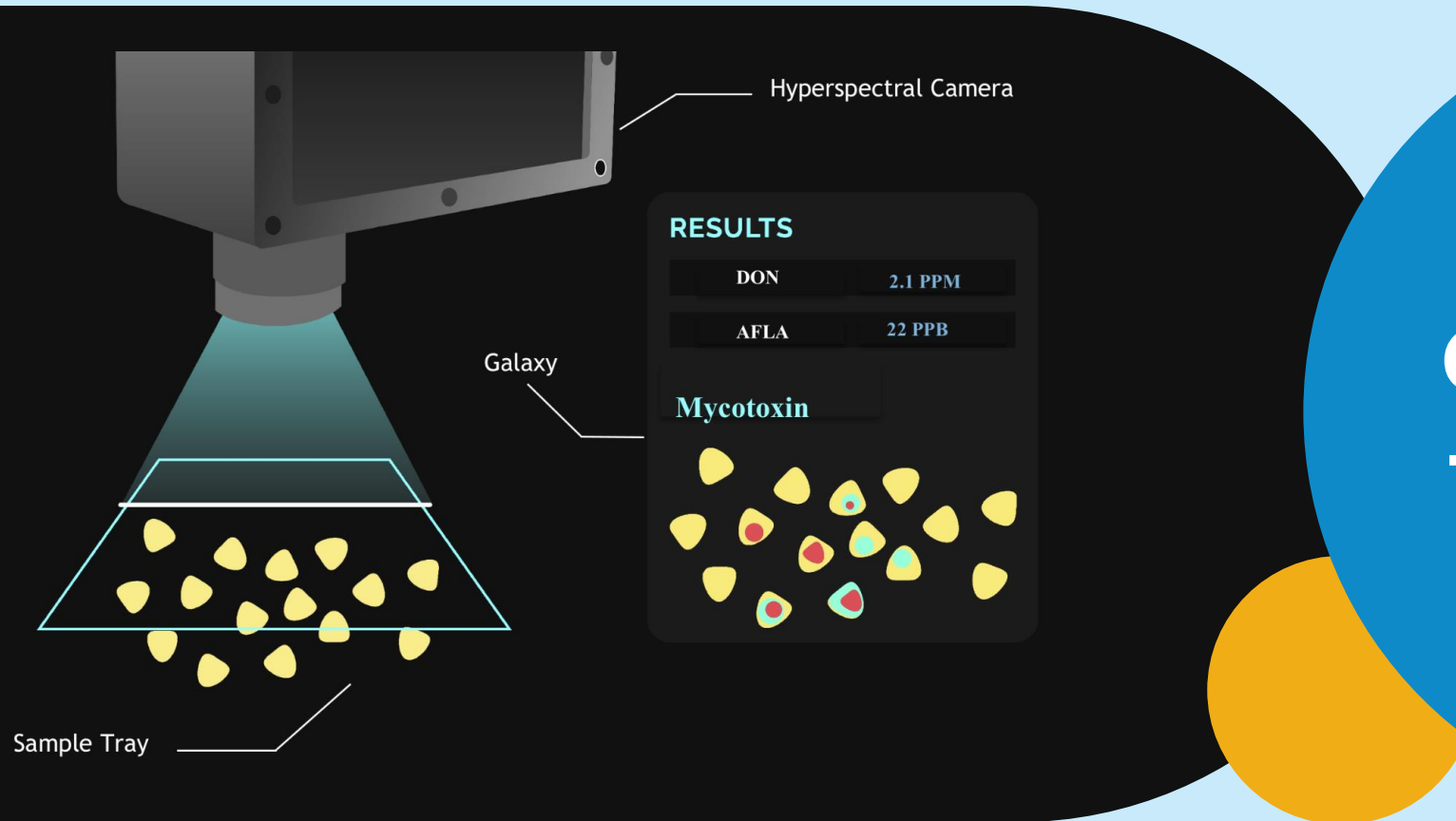
imagoAI's Galaxy is the first AI Food Safety Test

Microsoft

Machine Vision improves inspection efficiency

Augmenting human inspection capabilities through camera-based machine vision enables scenarios like complete inspection and reduction in false positives during defect detection.

bent tip : 0.100 mm,0.097 mm
incomplete weld : 0.084 mm,0.250 mm

Boston Scientific

incomplete weld: 0.73

bent tip: 0.58

Boston Scientific surgical device inspection

Business Impact Example

- Double human inspection replaced by single human AI augmented inspection.

- 50% reduction in inspection time through faster defect detection.

- $1.5M in labor cost savings for every 10 lines.

Microsoft

Industry: Manufacturing

Dow Chemical Company is a world leader in chemicals, plastics, synthetic fibers and agricultural products. Dow has tens of thousands of employees and operates plants in over 150 countries. Dow works with experts in almost every industry to help solve materials science challenges that prevent companies from growing and becoming more sustainable.

Founded: 1896

Objective

Operationalize a 33-stage generative molecular pipeline to leverage Azure DevOps and Azure Machine Learning Service. Through operationalization, Dow can realize the true value with a maintainable, extensible, scalable, and transparent ML Solution that can provide a core-service to Dow chemists globally.

AI-Driven Results

- ✓ **Separable and customizable CICD** - each module and library uses standardized and parametrizable build and release pipelines.
- ✓ **Rich telemetry** for audits and diagnostic allows for process traceability from the first commit to the final prediction
- ✓ **Extensibility** of the solution by refactoring the code base to layered services design with versioned libraries and modules
- ✓ **Scalability** using Azure Machine Learning Service compute and integrations

"Microsoft has created an amazing system ... we will surface additional needs for functionality that we want in the next round of collaboration."

Principal Research Scientist and Sponsor
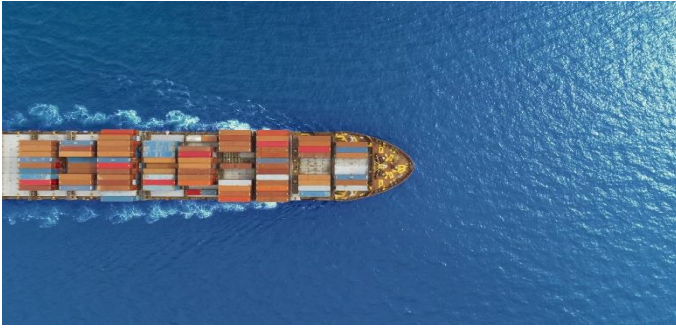**Dow Chemical Company**

Microsoft

AI now analyzes all our real estate leases and identifies problems and irregularities with clear recommendations and next steps for new negotiations.

Microsoft

AI moves pretty fast, If you don't stop and look around once in a while, you could miss it.

Define the outcome

Reduce idle time in supply chain by 17% with real-time interactive reports

Save $300,000 (USD) per day with predictive maintenance

Activate smart buildings for up to 20% energy cost savings

Save up to $65/hour per month per analyst, increase of 97.5% accuracy

Personalized service across 1,400 locations

Predict student drop-out propensity; improve graduation rates by over 25%

Microsoft

AI Ready and Data Enabled

For AI to be effective, your data must be:

1. Understandable with the right context

2. Of high quality — accurate, complete, consistent, timely, unique

3. Well-governed to support ethical and compliant use of data

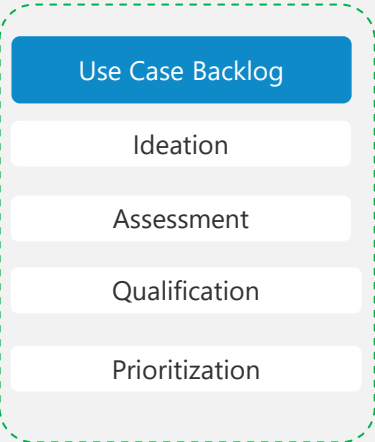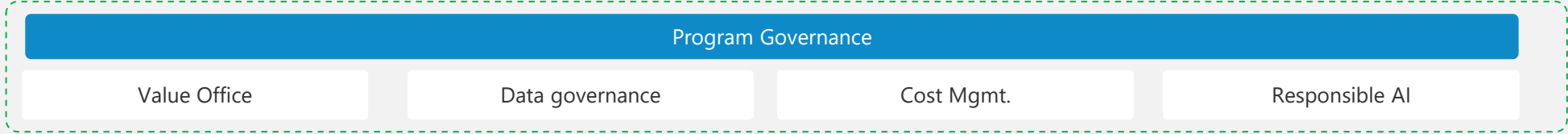4. Available, discoverable, and accessible

Data Sources

Apps

Sensors and devices

Information Management
- Data Factory
- Data Catalog
- Event Hubs

Data Stores
- Azure Synapse
- Data Lake Store
- SQL Data Warehouse
- SQL Database
- SQL Server Stretch Database
- DocumentDB

Machine Learning and Analytics
- Machine Learning
- Data Lake Analytics
- HDInsight
- Stream Analytics
- Storage Tables

Intelligence
- Generative AI
- Cognitive Services
- Bot Framework
- Microsoft AI

Dashboards & Visualizations
- Power BI

People

Apps
- Web
- Mobile
- Bots

Automated Systems

Data → **Intelligence** → **Action**

Microsoft

Applying AI in a Compliant and Responsible Manner

RAI in Practice
- Accountability
- Transparency
- Identifying, Measuring, Mitigating, and Monitoring RAI Risks
- Privacy & Security

Team Culture
- RAI Value
- Timing of RAI in Product Development
- AI Motivation
- Cross-Discipline Collaboration

Organizational Foundations
- Leadership & Culture
- Governance (RAI Policy, Processes & Infrastructure)
- Knowledge Resources
- Tooling

https://aka.ms/RAIMM

Microsoft

Industrializing AI for Business Results

1. AI Center Of Excellence

Streamlines capabilities and adoption, reducing the time and effort required to bring AI projects from concept to reality. Increases operational efficiency and reduces time-to-market.

Program Governance

Value Office	Data governance	Cost Mgmt.	Responsible AI

Use Case Backlog

- Ideation
- Assessment
- Qualification
- Prioritization

2. Use Case Engine

Aligns AI initiatives with business objectives, ensuring resources are allocated to high-impact projects. Accelerates decision-making and increases business value.

Setup

UC analysis	AI platform target
Env.Setup	Sprint backlog

Agile Development

Scenario	PoCs	Implement

Industrialization

Target infra.	Tooling
Infra. evolution	
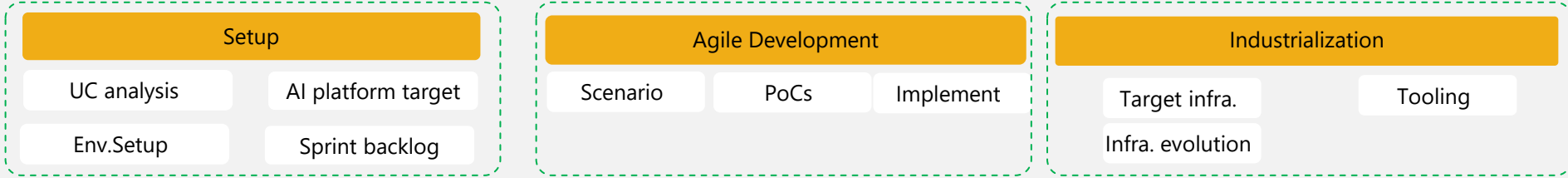
3. Platform Capabilities

Speeds up the deployment process, ensuring that AI solutions can start delivering value as soon as possible. Increases business agility and allows for quicker realization of ROI.

Data Platform Foundation

Data Science	Pre-built models	Data visualization
Analytics		

Core & Future Capabilities

LLMOps	Speech	Maintenance	Knowledge xfer
RespAI/ Guardrail	...	Extensions...	HPC

Microsoft
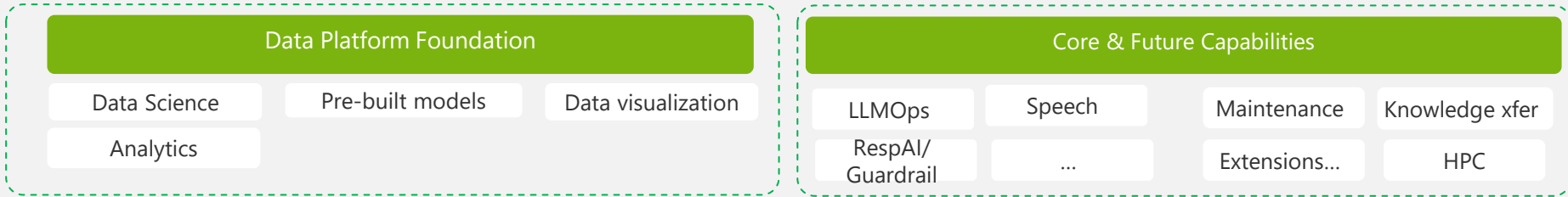
Gain Visibility: AI and Digital Twins

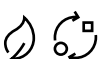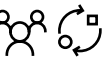**What do you all think that a Digital Twin could mean to you and your teams when building a new facility?**

Or uplifting a legacy facility?

Microsoft

Capabilities of a Factory Digital Twin

1 Collaboration in the Metaverse

2 Remote Visibility Control Tower

3 Integrated Planning & Scheduling

4 Asset tracking & Digital Maintenance

5 Factory Simulation & Root Cause Analysis

6 Intelligent Process Control & Automation

7 Connected Worker

8 Energy Cost Optimization

Collaboration Closed Loop Optimization Simulation Sustainability Impact

Digital twins enable informed action and control

Process control using digital twins

"What if" scenarios for emergency management

Power by the hour with asset tracking

Deeper collaboration across value chain

Remote Operations

Rewind and replay

Serialized asset tracking

Digital verification and validation

Digital Twins are helping JCI's customers and partners with

- 24/7 equipment performance monitoring and alarm management
- Proactive and predictive maintenance with actionable insights reduces downtime
- Optimize maintenance resource pool and incident response time

Approach to build Digital Twins at Scale

Build a Data
Platform to break
down data silos

Bring the Future
Factory vision to life
rapidly through an
MVP approach

Ensure you are
compliant to your
industry regulations

Identify key use
cases with the
biggest impact

Align with
Stakeholders to
validate the value
and deploy at scale

Q&A

bgillispie@microsft.com
andaly@microsoft.com

Please Keep All Hands and Feet Inside the Ride…..

Microsoft