

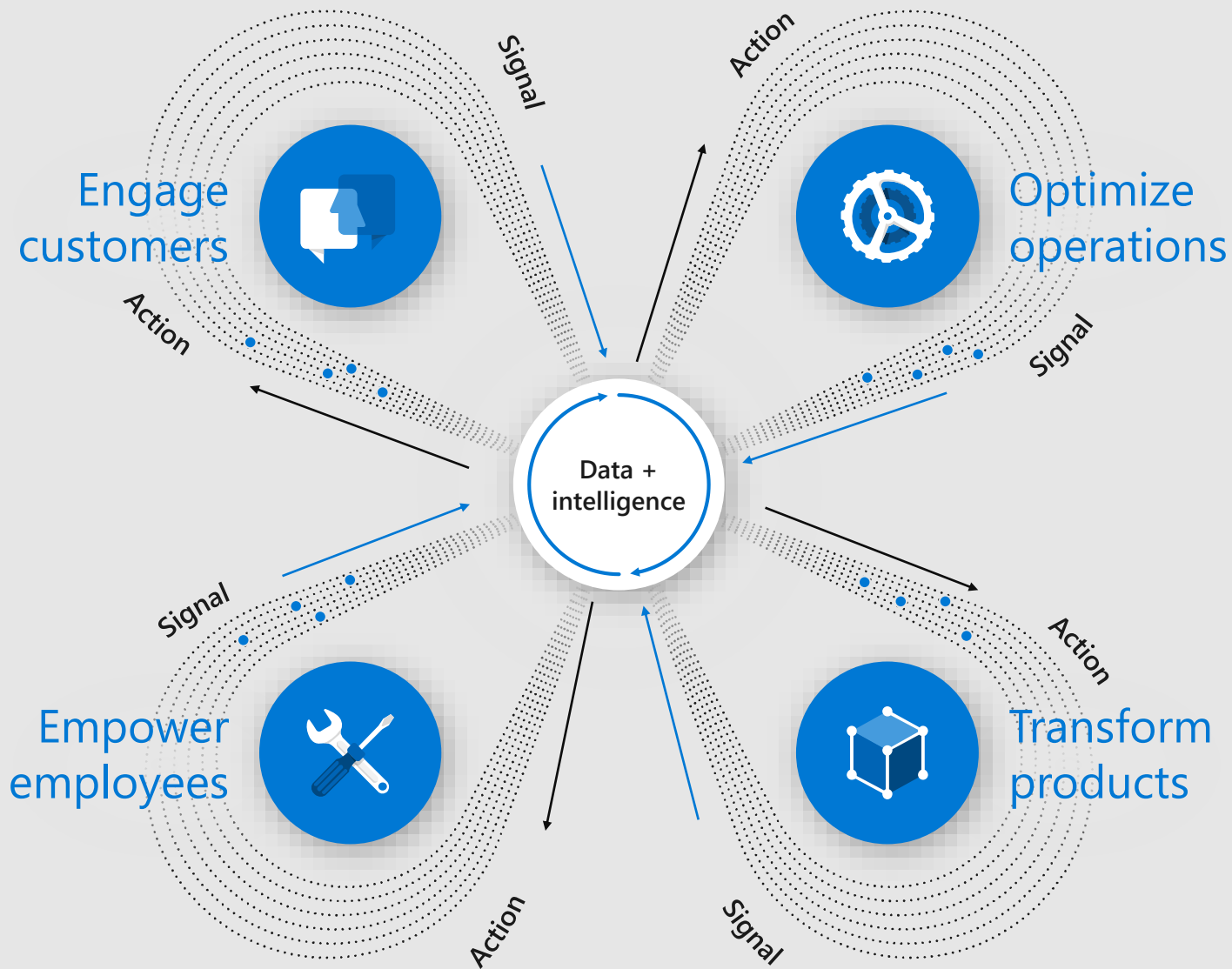


# Big Data & Machine Learning Applications in Manufacturing

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**80B**

Connected “things” by 2025  
generating 180ZB of data



**\$130B**

New monetization avenues  
due to IoT-related services



**80%**

Companies that increased  
revenue as a result of IoT  
implementation



**\$100M**

Average increase in  
operating income (avg. 8%)  
among the most digitally  
transformed enterprises

# Rolls-Royce

## Objectives

Rolls-Royce wanted a solution to enhance the life cycle of its aircraft engines. The company's engines power more than 50K flights worldwide every month, so it wanted to provide its mechanics the right tools at the right place to be able to fix problems.

## Tactics

Rolls-Royce used Microsoft's Azure IoT Suite & Cortana Intelligence Suite to quickly diagnose issues with plane engines. Information on engine health, air traffic control, route restrictions, and fuel usage are collected from hundreds of sensors inside the engines to detect operational anomalies.

## Results

- Achieved 1% fuel savings (\$250,000)
- Improved airline efficiency
- Help make sure planes fly on more efficient routes and that the correct replacement parts are in the places where they are needed the most

**"Our goal is not data for the sake of data, but to embrace the cloud and analytical technologies to deliver more expert insights to the right stakeholders at the right time."**

Nick Farrant  
Senior Vice President, Rolls-Royce



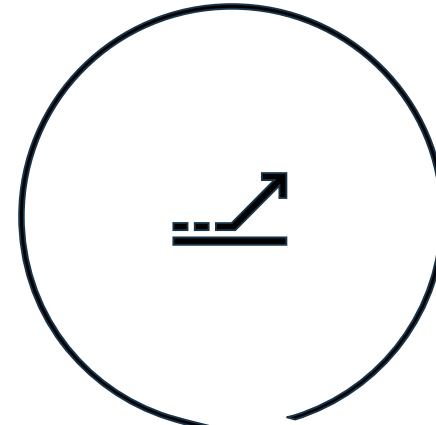
Rolls-Royce®



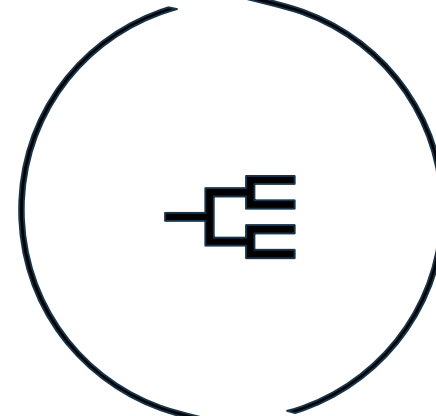
# What does the intelligent manufacturer look like?



# Breakthroughs Enabling Intelligence



Big Data



Powerful  
Algorithms

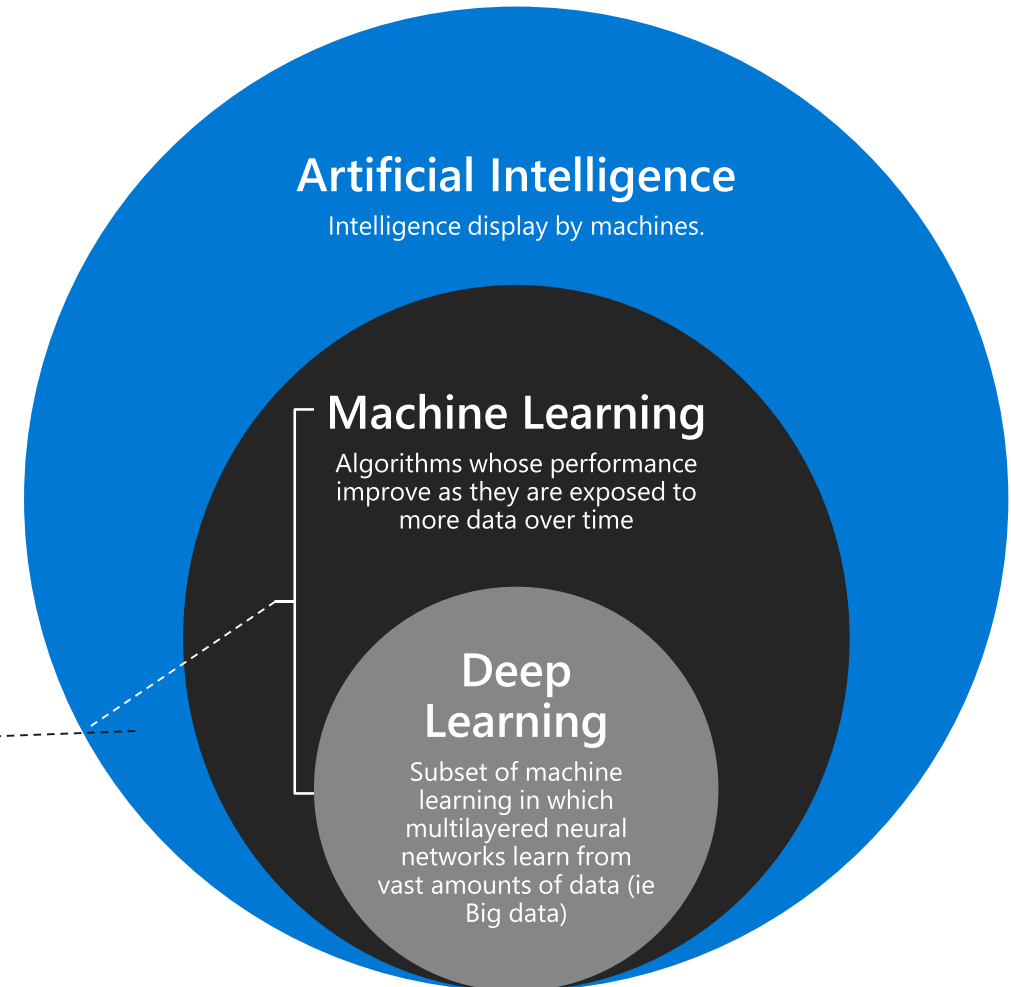


Cloud  
Computing

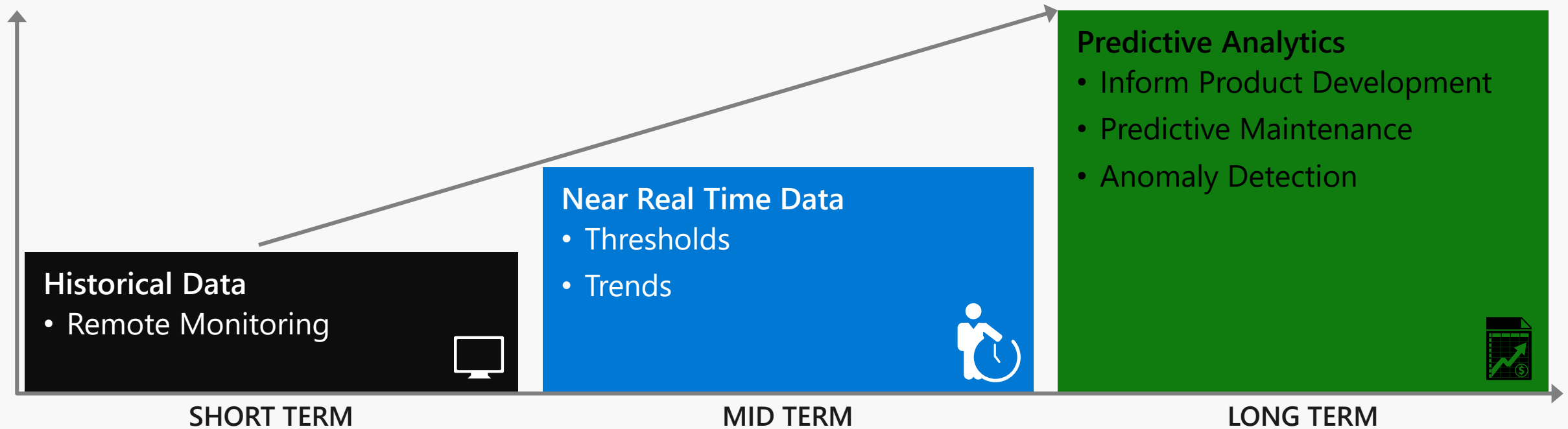
# Artificial Intelligence (AI) is intelligence displayed by machines

AI is not one universal technology, it is an **umbrella term** that includes multiple technologies such as machine learning and deep learning, computer vision, and natural language processing (NLP) that, individually or in combination, **add intelligence to machines**.

**Big data:** term for data sets that are so large or complex that traditional data processing applications are inadequate. Analysis of big data can find new correlations to "spot business trends, prevent diseases, combat crime, and so on



# Business value grows with data modelling



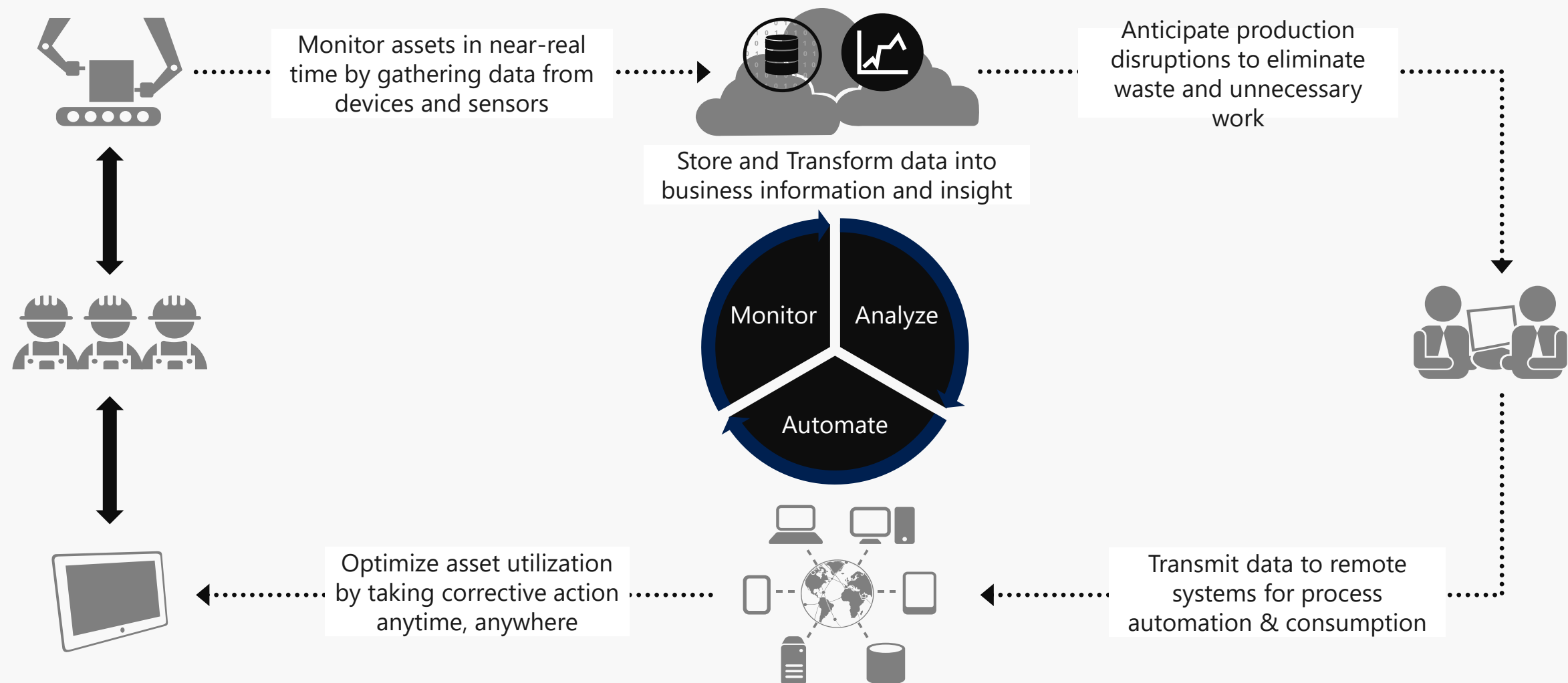
## Event Data Value

- ✓ Machine performance & quality
- ✓ Automated Machinery Logbook
- ✓ Maintenance Record
- ✓ Contextual reporting (PBI)
- ✓ Knowledge Management

## Telemetry Data Value

- ✓ Line Manager: Threshold Dashboard
- ✓ Operator: Machine monitoring and alerting
- ✓ Operation Manager: Trending insights on operational performance

# Improve operational efficiency and maximize asset utilization





# Factory of the future

A complex ecosystem of self-regulating machines and sites, able to customize output, optimally allocate resources, and offer a seamless interface between the physical and virtual worlds of construction, assembly, and production.



Open  
value chain



Flexible  
production

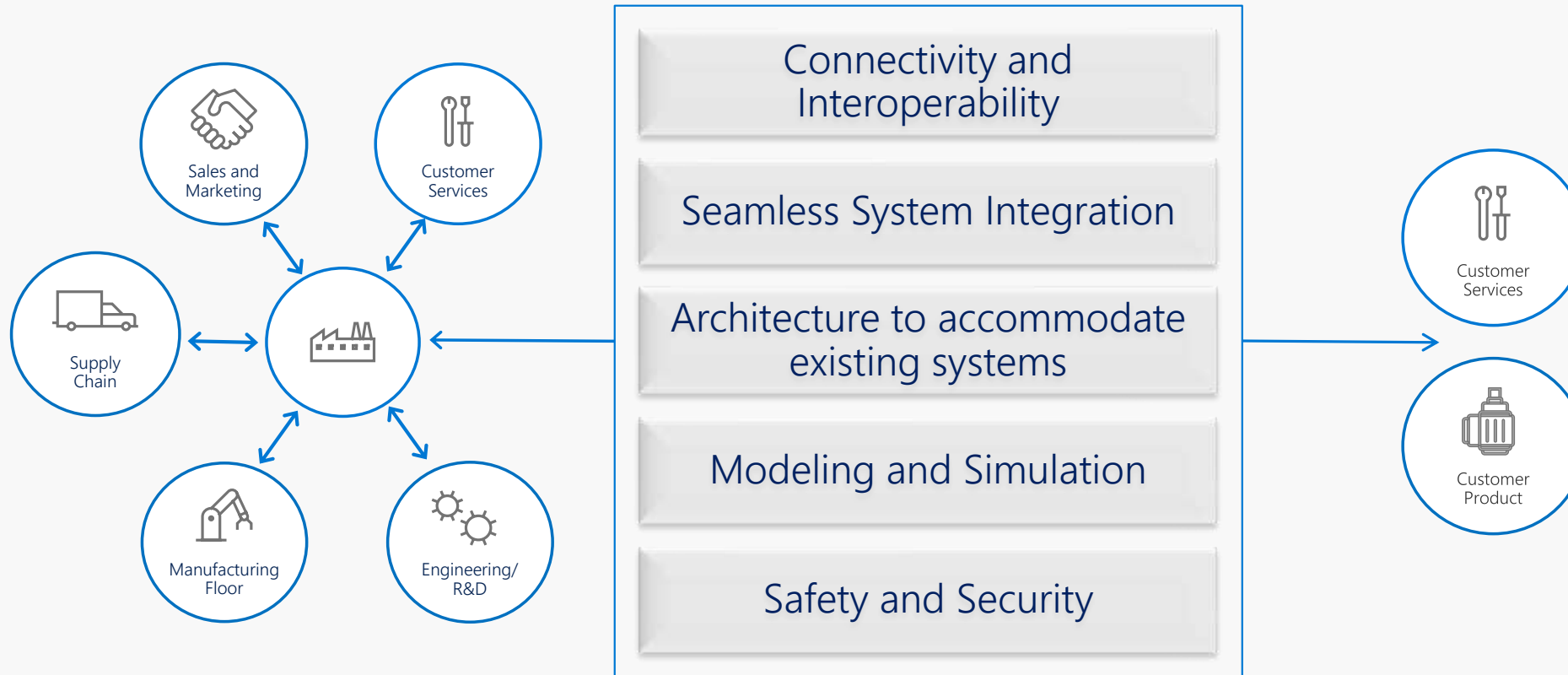


Co-bot  
manufacturing

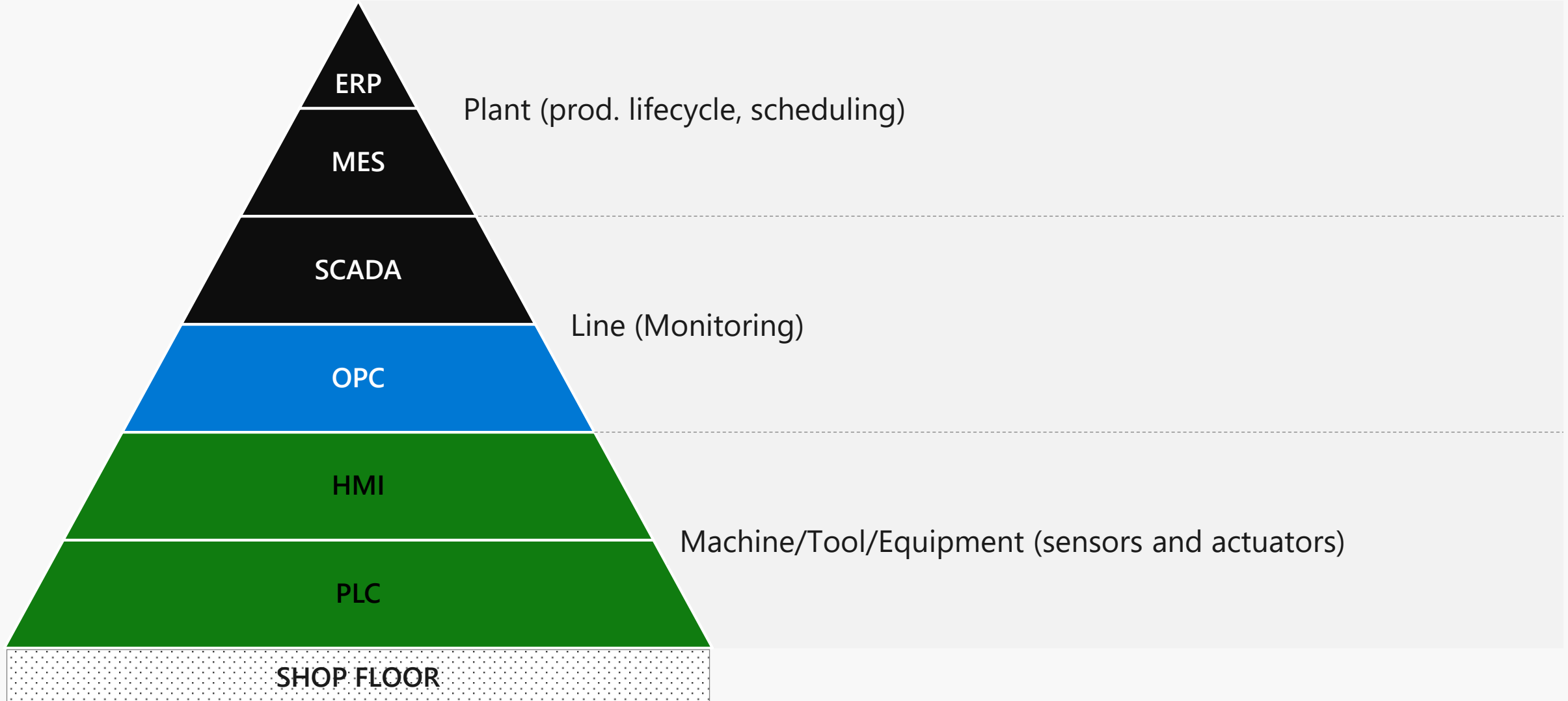


Innovative  
business models

# Technology driving the Factory of the Future



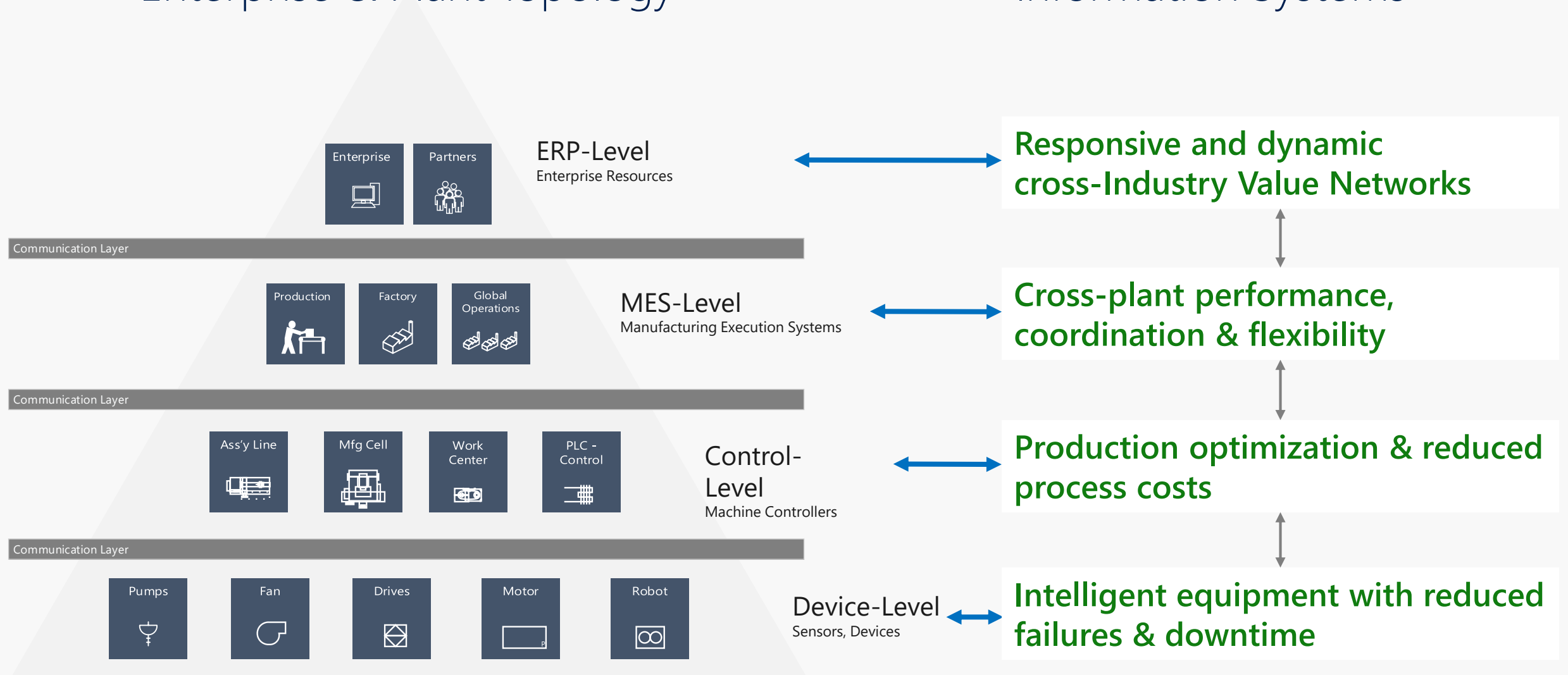
# Typical Manufacturing Systems...



# ...Requires transformation to unlock the value of data

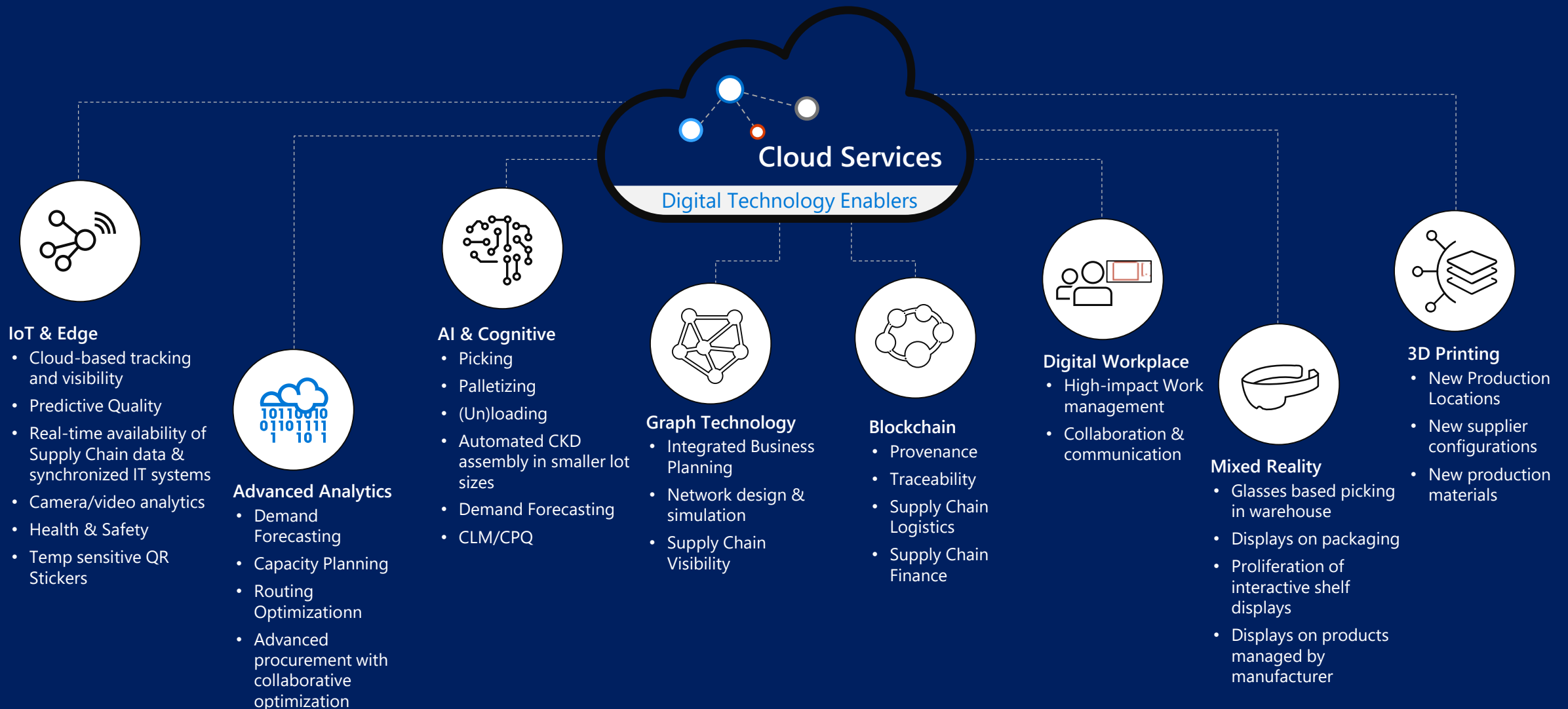
## Enterprise & Plant Topology

## Information Systems

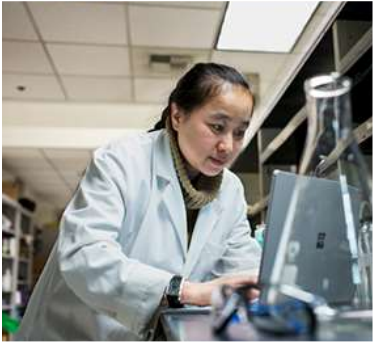
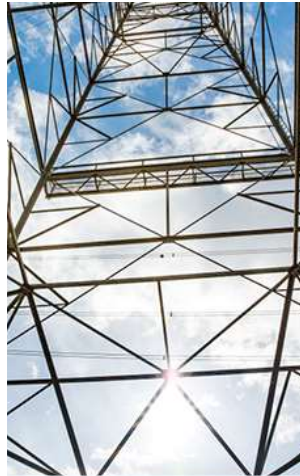




# Technology Enablers for the Factory of the Future

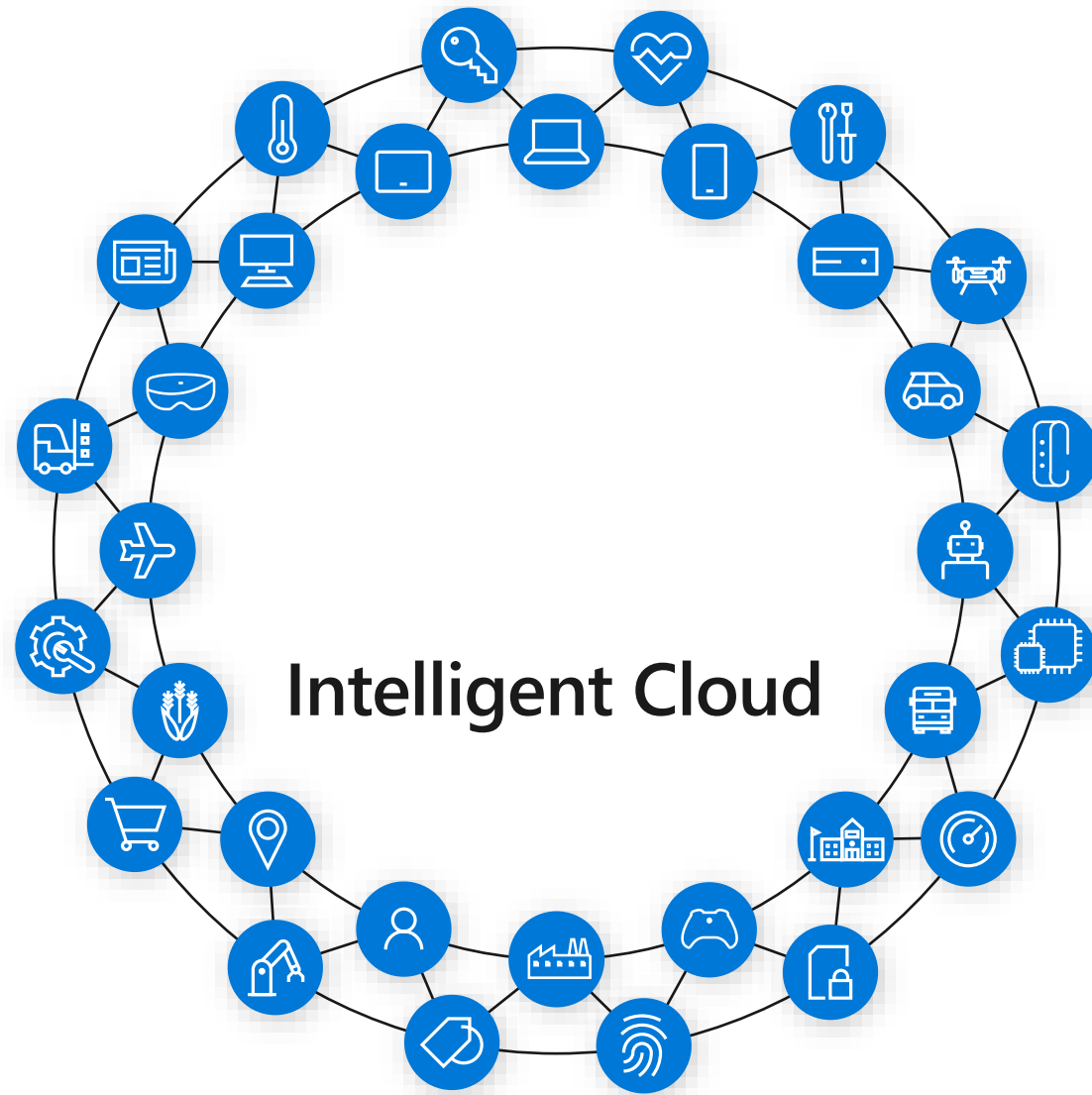


# MICROSOFT INVESTS \$5 BILLION IN IOT



Our goal is to give every customer the ability to **transform** their **businesses**, and the world at large, **with connected solutions**

<https://blogs.microsoft.com/iot/2018/04/04/microsoft-will-invest-5-billion-in-iot-heres-why>



Intelligent Cloud

Intelligent Edge

# A large and growing ecosystem

## System integrators



## Solution providers



## Azure certified for IoT



## Developer, IT and, productivity







Azure is the right choice

Your vision. Your cloud.  
Azure. Cloud for all.

# AI School

Whether you're completely new to AI or a seasoned professional looking to stay on top of your game, AI School is quite simply the best place to find the information, learning materials and resources you need to start building intelligence into your solutions.

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