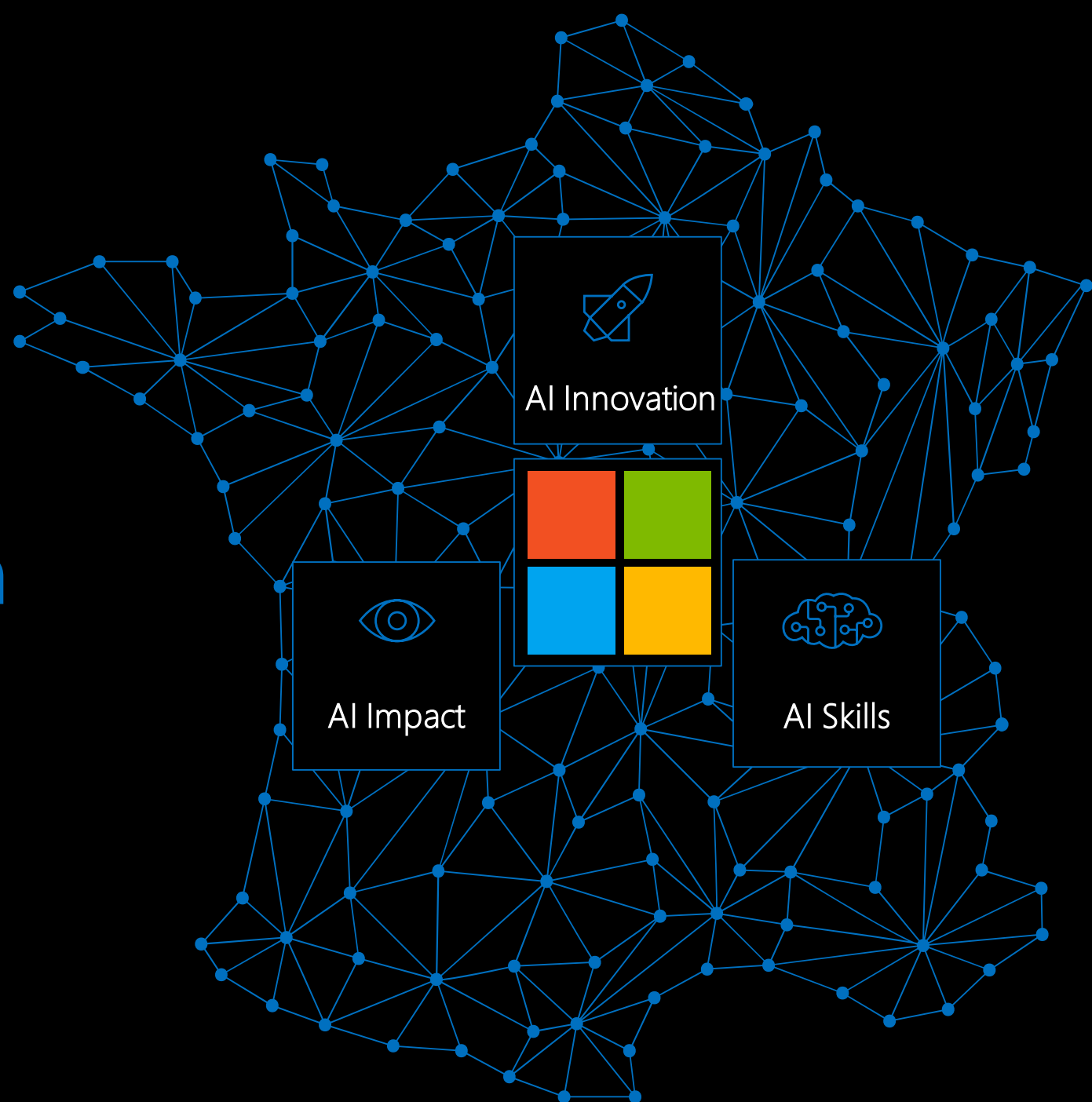Microsoft

IoT in Action

#IoTinActionMS

Microsoft

Evolving IoT with AI, Mixed Reality and Automation

Nicolas Coudert
IoT & Intelligent Edge Business Lead,
Business Group
Marketing & Operation
Microsoft France

France AI Plan

AI Impact is a think & Do tank with Microsoft customers and partners *addressing the ethical and societal challenges of AI* by reflecting on issues related to health, transport, energy, environment, food and accessibility.
Support innovative projects to *positively impact the world of tomorrow* and publish recommendations to foster the emergence of a responsible AI

ENERGY & ENV.   AGRI-FOOD

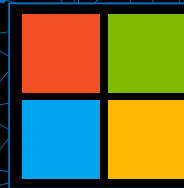TRANSPORTATION   HEALTH

FINANCIAL SERVICES

AI INNOVATION
Promote the growth of five strategic ecosystems : health, environment/energy, transportation, financial services, and agri-food
- **Foster and Shape breakthrough projects/solutions** opportunities and engage with key players on 5 Ecosystems
- **Accelerate Innovation via AI Factory**
  - Support AI Start-ups ecosystem, accelerate co-innovation with corporate
- **Leverage Applied Research via INRIA partnership** to drive innovation and business growth with strategic customers ; Participate in PRAIRIE (PaRis Artificial Intelligence Research InstitutE) to build bridge between research and Industries

AI Impact

AI Innovation

AI Skills

The objective of the **AI Skills** program is to **train 400,000 people over three years**, with the **creation of 3,000 new jobs** in the French digital ecosystem
Address Digital, coding and AI awareness for kids
Professionals: with top partners (Adecco, Manpower, Global Knowledge and Pole Emploi) drive reskilling/upskilling
- NEETs (Not in Education Employment or Training) Professionals: Build and develop *AI Schools as* a "franchise" for partners and LRG to leverage

Evolution of industrial systems

Mechanized systems

Automated systems

Autonomous systems

Powered by **steam or electricity**

Manually operated
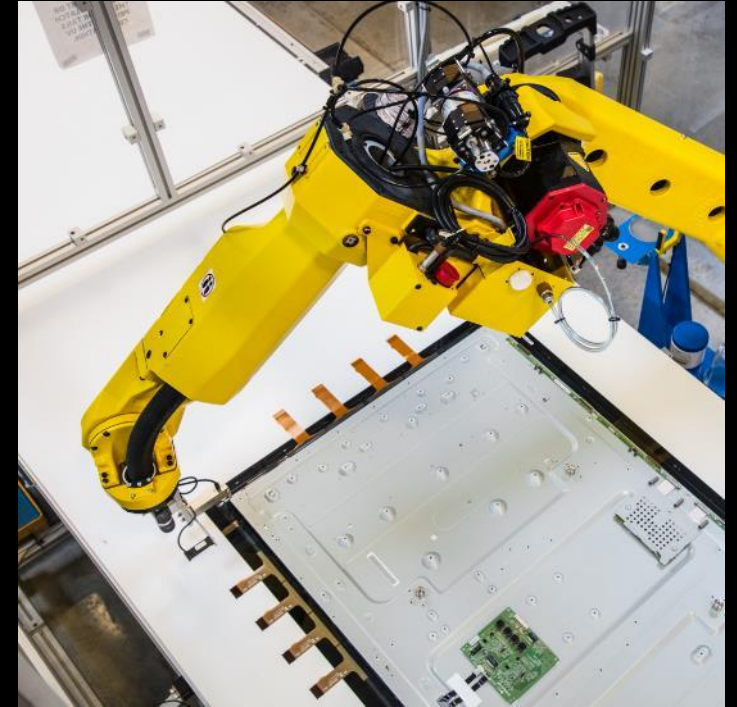
Powered by **software**

Fixed operation

Powered by **AI**

Intelligent operation

Sense – Act – Learn - Adjust

Intelligent Edge

We are living in an automated world

ALTAMETRIS : l'IA pour gagner du temps et augmenter la précision des résultats

Enjeux

- **Traiter d'importants volumes de données**, les **classifier**, et les sélectionner pour avoir une grande **précision dans les résultats**
- **Distinguer l'information utile** pour **détecter les défauts** de composants et **assurer la maintenance préventive et prédictive** des sites industriels

Solutions

- **Drônes:** pour capturer les données
- **Intelligent Edge et Microsoft Azure** : traitement, stockage et analyse des gros volumes de données
- **Viséo** : algorithmes permettant d'aniticiper l'état de composants industriels

Bénéfices

- Production **d'informations utiles, pertinentes et précises** pour les collaborateurs du groupe
- **Gain de temps et de productivité**
- **Réalisation d'économies** sur la maintenance et la modernisation des équipements grâce à l'anticipation des défauts

« L'information délivrée doit être ultra précise avec une marge d'erreurs maîtrisée. Intelligent Edge et le Cloud Azure IoT nous permettent de répondre à cet objectif de perfection »
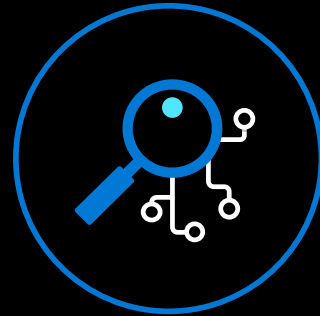
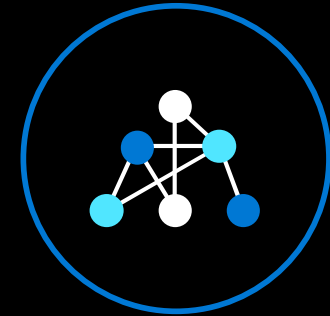— **Nicolas Pollet ,** *Directeur Général - ALTAMETRIS*

ALTAMETRIS

Azure AI

AI apps & agents

Knowledge mining

Machine learning
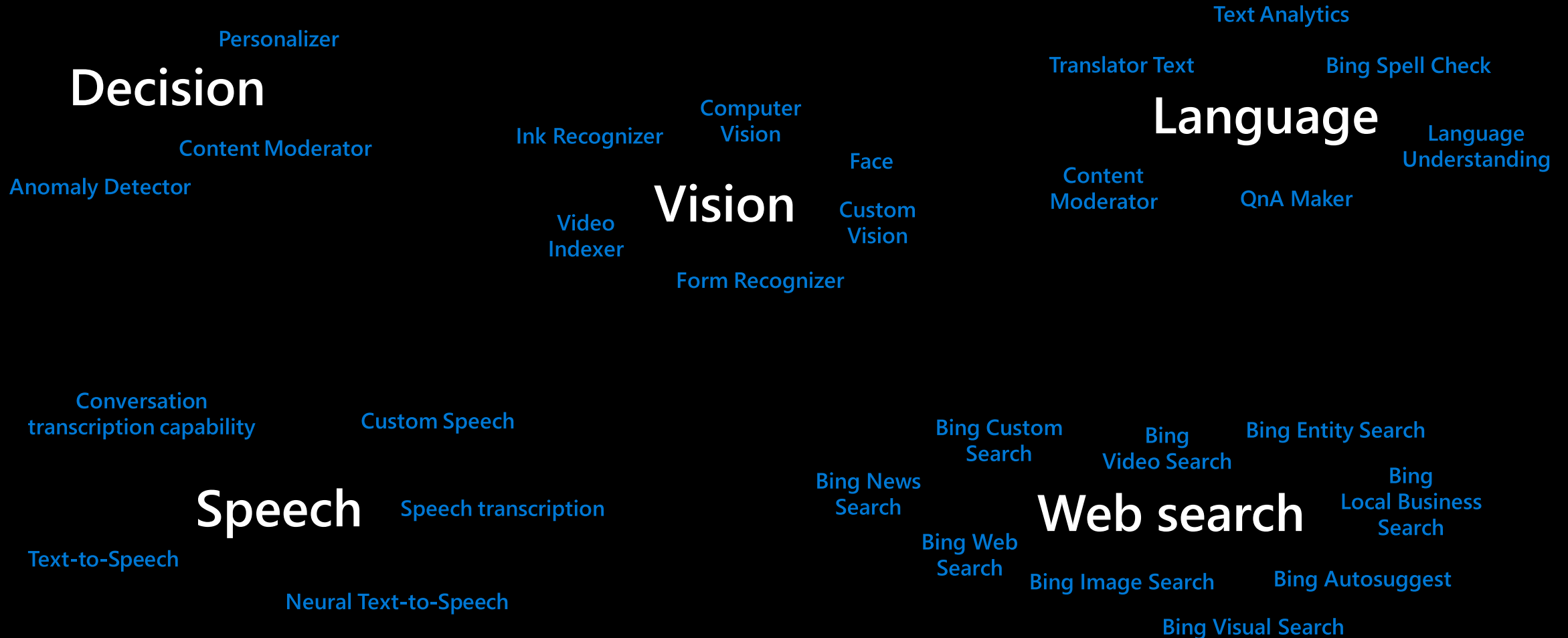
Deliver breakthrough experiences

AI apps & agents

- Cognitive Services
- Bot Service

Azure Cognitive Services

The most comprehensive pre-trained AI

Decision

Personalizer

Content Moderator

Anomaly Detector

Vision

Ink Recognizer

Computer Vision

Face

Custom Vision

Video Indexer

Form Recognizer

Language

Text Analytics

Translator Text

Bing Spell Check

Language Understanding

Content Moderator

QnA Maker

Speech

Conversation transcription capability

Custom Speech

Speech transcription

Text-to-Speech

Neural Text-to-Speech

Web search

Bing Custom Search

Bing Video Search

Bing Entity Search

Bing News Search

Bing Local Business Search

Bing Web Search

Bing Image Search

Bing Autosuggest

Bing Visual Search

Azure Cognitive Services

Deploy anywhere using containers

Azure Cognitive Services
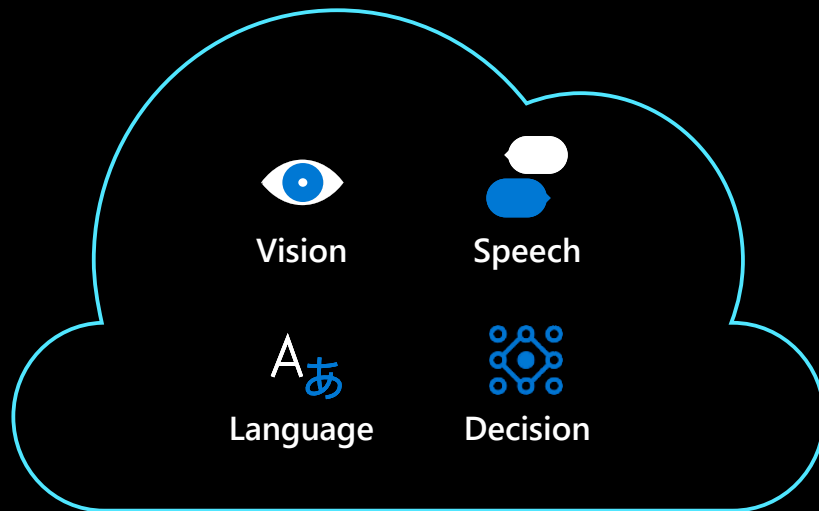
Wherever your data resides

Vision

Speech

Language

Decision
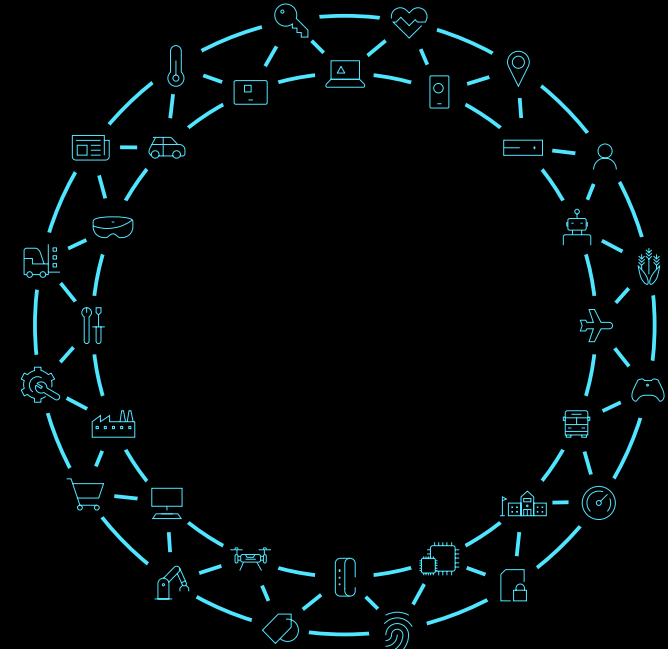
Azure AI

Fueled by Microsoft breakthrough research

MSR Cambridge

MSR Montreal
MSR New England

MSR Redmond

MSR New York

MSR Beijing

MSR Shanghai

MSR India

First FPGA deployed in a datacenter

39.5 Teraflops with Intel Stratix 10

Speech recognition human parity

94.9% on Switchboard test

Machine translation human parity

69.9% with MT Research system

Conversational Q&A human parity

89.4% on Stanford CoQA test

Object detection human parity

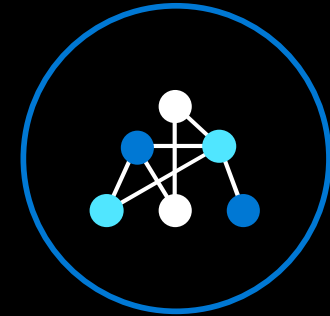96% on RESNET vision test

Azure AI

AI apps & agents

Knowledge mining

Machine learning

Machine Learning on Azure

Domain specific pretrained models
To simplify solution development

Vision   Speech   Language   Web search   Decision

Familiar data science tools
To simplify model development

Visual Studio Code   Azure Notebooks   Jupyter   Command line

Popular frameworks
To build advanced deep learning solutions

PyTorch   TensorFlow   Scikit-Learn   ONNX

Productive services
To empower data science and development teams

Azure Machine Learning   Azure Databricks   Machine Learning VMs

Powerful infrastructure
To accelerate deep learning

CPU   GPU   FPGA

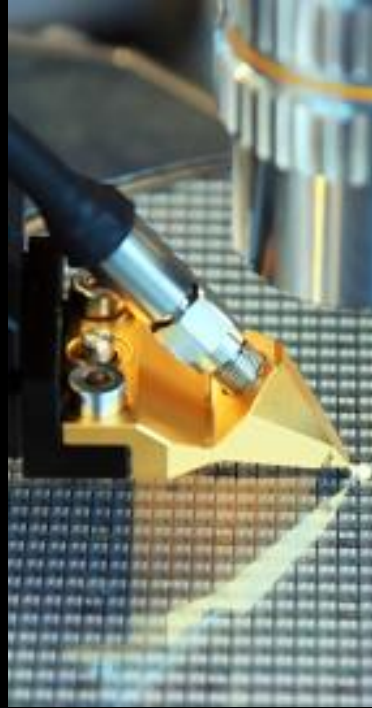**From the Intelligent Cloud to the Intelligent Edge**

Autonomous systems scenarios

Motion control   **Smart buildings**   **Machine calibration**   **Process control**   **Industrial robotics**

Deploy machine learning models at scale

Azure Machine Learning service

Build and Train Models

Automated ML

+

Train Models

Azure ML Compute

Validate

Containerize and test on Azure Container Instance

Deploy Models

Scale with Azure Kubernetes Service

Monitor

Monitor models with Azure ML

Azure DevOps integration

CI/CD and model retraining
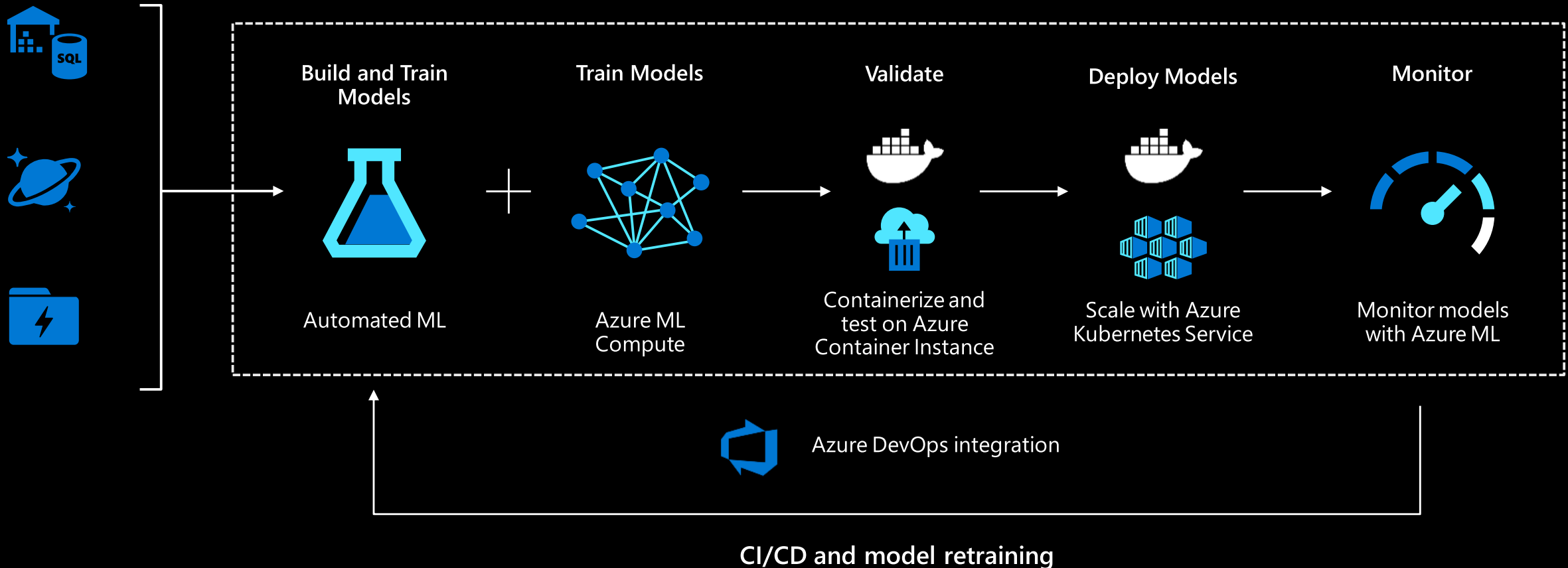
Free AI online training & certification

Microsoft

AI Business School

INSEAD

Business leaders can use AI Business School to gain specific, practical knowledge to define and implement your AI strategy. Hear directly from industry experts on how to foster an "AI-ready" culture and learn how to use AI responsibly and with confidence.
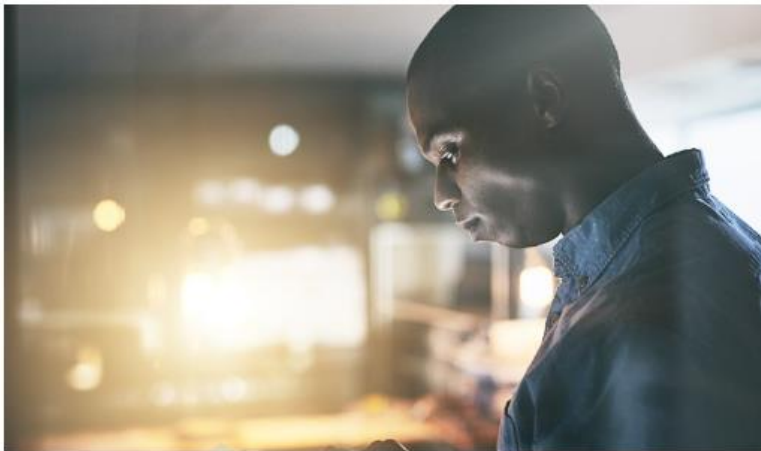
Define an AI strategy to create business value

8 MODULES | 4 HR 16 MIN | BEGINNER > INTERMEDIATE

Learn More >

Discover ways to foster an AI-ready culture in your business

6 MODULES | 3 HR 10 MIN | INTERMEDIATE
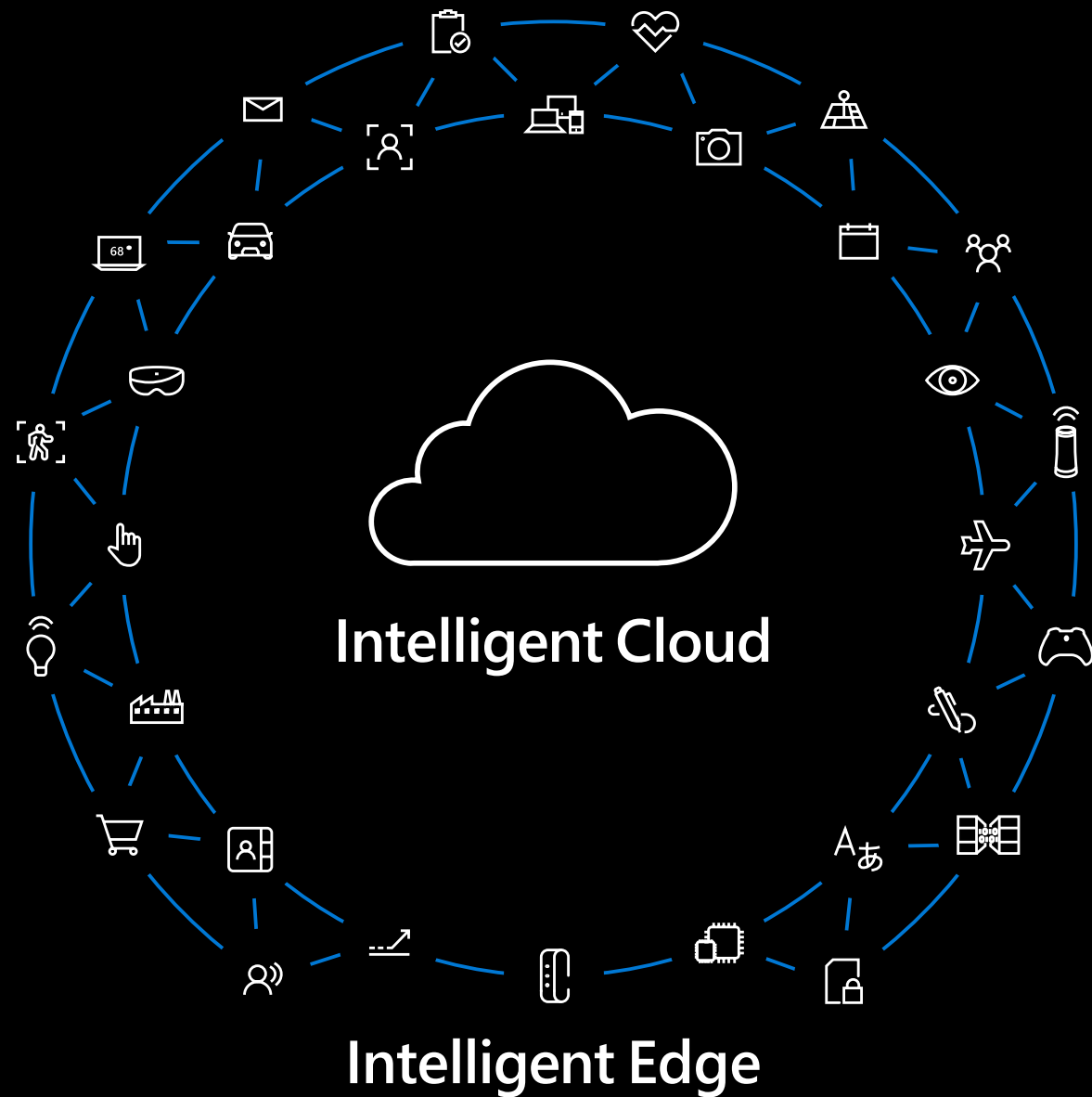
Learn More >

Identify guiding principles for responsible AI in your business

3 MODULES | 55 MIN | INTERMEDIATE

Learn More >

People-centred
experiences

Artificial
Intelligence

Ubiquitous
computing

Intelligent Cloud

Intelligent Edge

Mixed reality

A blending of the physical and digital worlds in which users may interact
with digital and real-world objects while maintaining presence in the physical world
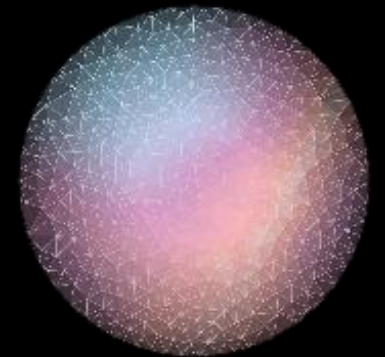
Physical world

Digital world

Augmented reality

Virtual reality

Mixed reality spectrum

The Microsoft mixed reality stack

Mixed Reality Applications	Microsoft Dynamics 365	Microsoft Partner | Mixed Reality
Azure Cognitive Services	Vision Speech Language Knowledge Search	
Azure Mixed Reality & IoT Services	Azure Digital Twins Azure Spatial Anchors Azure Remote Rendering	
Intelligent Edge Devices		
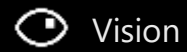
The 3rd wave of computing

Design & Prototyping

Training & Development

Geospatial Planning

MIXED REALITY

Sales Assistance

Field Service

Productivity & Collaboration

Digital Engineering and Manufacturing Services

WE ARE

- **DEMS, as part of Capgemini,** the leader of physical and digital worlds convergence,

- The best partner providing digital experiences through technology, engineering and manufacturing expertise,

- Focused on delivering sectoral key offers :

  Connected Products

  Smart Engineering

  Digital Manufacturing

WE AIM AT

- Addressing the complete product development + experience value chain

- Partnering our industrial customers in their innovation strategy, help them finding the best fitted solution to their needs

- Being the best fellow player supporting Industry 4.0 transformations

North America
1000

Europe
4000

APAC
5000
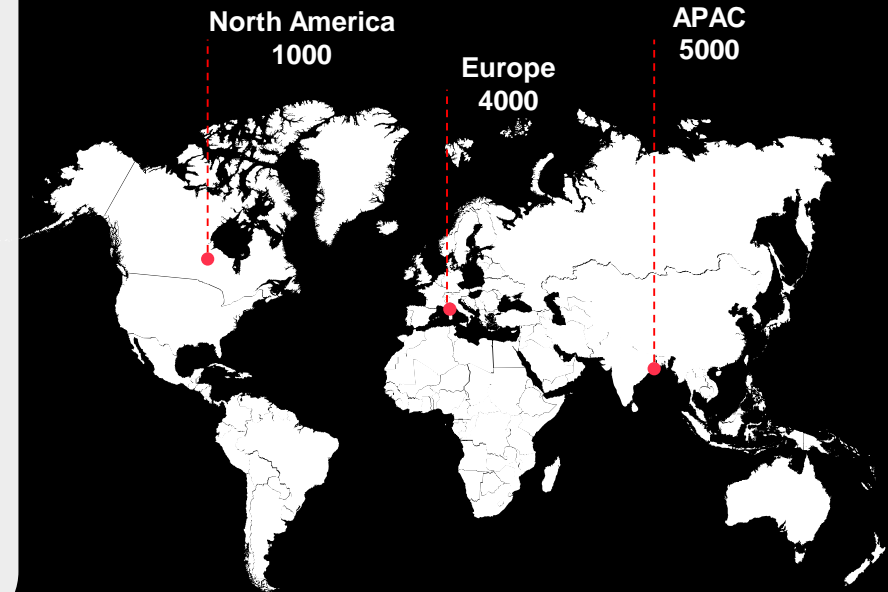
**Delivering engineering solutions
for over 30 years through a mature worldwide Delivery model:
Rightshore relying on 4000+ FTE Indian base dedicated to DEMS**

Capgemini

Capgemini – « Ecole IA Microsoft »

Capgemini is expanding its AI capabilities with Microsoft through a series of strategic services aimed at helping enterprises to accelerate their adoption of AI technologies. The new services include AI Engineering for production-grade Data and AI platforms, AI for Operations Intelligence and AI for Customer Experience.
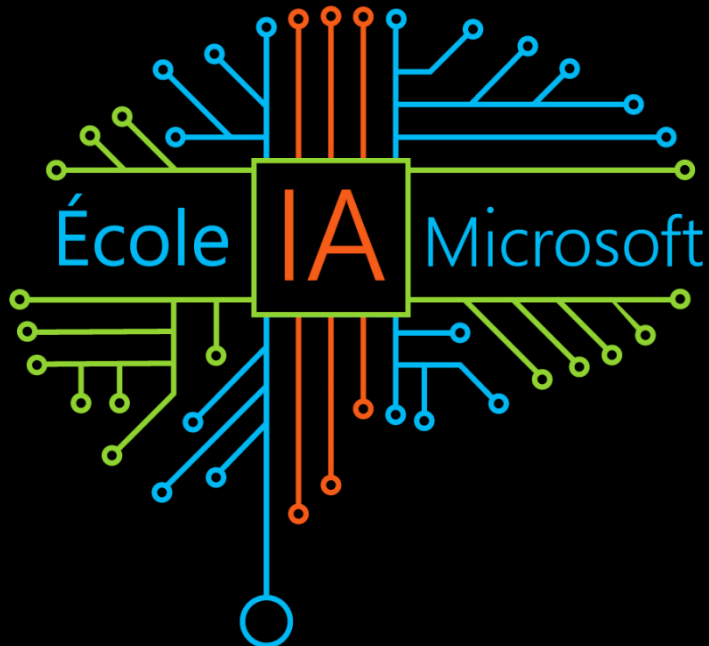
RELEVANT POINTS

STUDENT PROMOTION

3 Capgemini recruitment sessions
100 candidates
22 selected students for the Capgemini promotion
11 womens / 11 mens

LEARNING SESSIONS

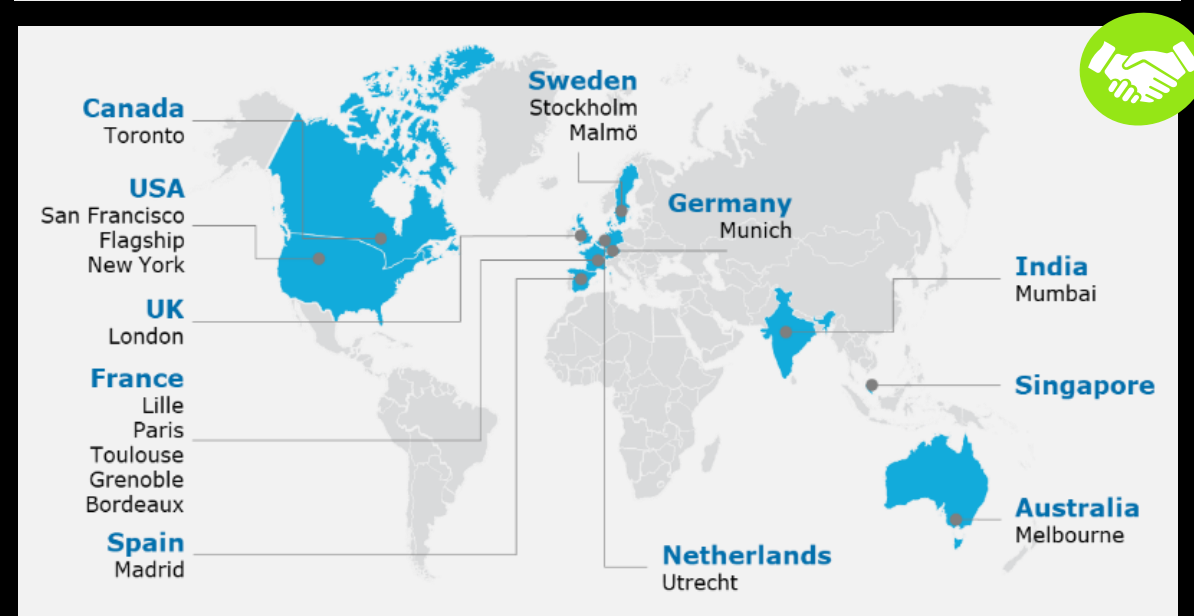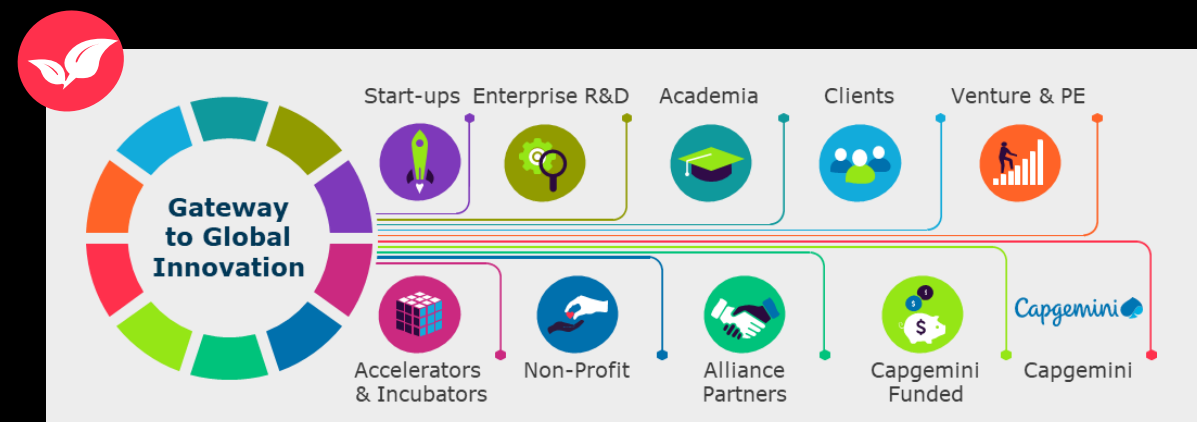| |
|---|
| Capgemini Tech lead instructors |
| 6 learning months |
| • Big Data Management |
| • AI & Analysis |
| • Microsoft solutions |
| • Consultant soft skills |

NEXT STEPS

Apprenticeship at Capgemini France
Starting in november

Our Applied Innovation Exchange Lab

A **global platform** enabling our clients to explore the innovation landscape; contextualize opportunities within their business; experiment with new concepts and ideas; and de-risk innovation efforts.
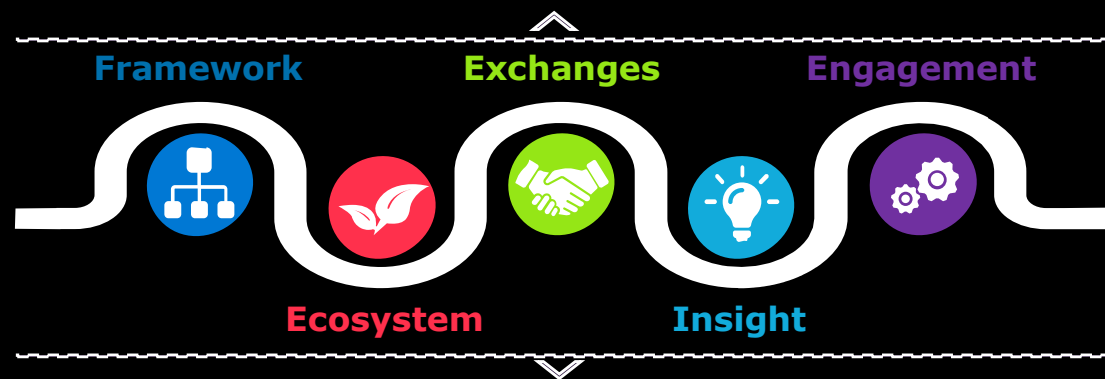
A combination of **physical environments** and a **framework** — designed to accelerate the time-to-value for innovation.

Framework

Exchanges

Engagement

Ecosystem

Insight

Discover — Exploring emerging techs, sector trends, business issues & associated organizational impacts

Devise — Shaping ideas & insights into business models, prototype & technical architectures

Deploy — Guiding launch, test & team alignment to ensure innovation is adopted at speed and scale

Sustain — Helping advanced innovation process, improve proficiency & implement best practices

Gateway to Global Innovation

Start-ups | Enterprise R&D | Academia | Clients | Venture & PE

Accelerators & Incubators | Non-Profit | Alliance Partners | Capgemini Funded | Capgemini

Capgemini

Canada — Toronto

USA — San Francisco Flagship, New York

UK — London

France — Lille, Paris, Toulouse, Grenoble, Bordeaux

Spain — Madrid

Sweden — Stockholm, Malmö

Germany — Munich

India — Mumbai

Singapore

Netherlands — Utrecht

Australia — Melbourne

Andy³ᴰ Remote ...an immersive Remote Assistance Platform for immediate help

Operator --- Wifi / 4/3G / Low band Management --- **Expert**

SaaS mode Azure */ On premise*

SDK

Collaboration
Audio / Video Streaming / Photo / Annotation / Documents / Screen Sharing

Full immersion allowed

Multi-OS / Devices
Windows / Android / iOS/
PC / Tablets / Smartphones
Glasses: HoloLens / Realwear

AR *Markerless Annotation*
3D *CAD Model Sharing*

Tailored IS/IT Integration / Security

https://www.youtube.com/watch?v=j3JDeYR6Ctw

High benefits for lower complexity of implementation!

Number of experts' intervention down **40%**

Incident resolution time reduced by **80%**

Fewer trips **30%**

They trust us!

SAFRAN, AIRBUS, Schneider, CNES, MAN, AIRBUS DEFENCE & SPACE

Capgemini

Microsoft Azure & HoloLens Partnership

- Global partnership on Azure
« **Microsoft Country Partner of the Year Award 2018** »

- Capgemini is HoloLens 2 "**Distributed Manager Partner**" qualified
- Andy3D Remote is part of **Microsoft official catalog**

- Capgemini is a **"Mixed Reality Partner Program"** certified with Andy3D product and all other HoloLens developments

June 29, 2019

Other activities where Immersive Technologies are used:
Training, Assembly, Maintenance, Inspection
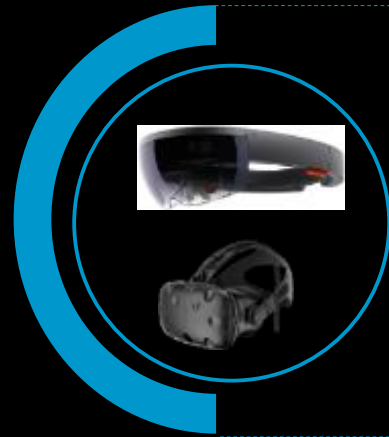
Digital Worker
Empowering operators with digital, mobility, augmented, virtual and mixed reality
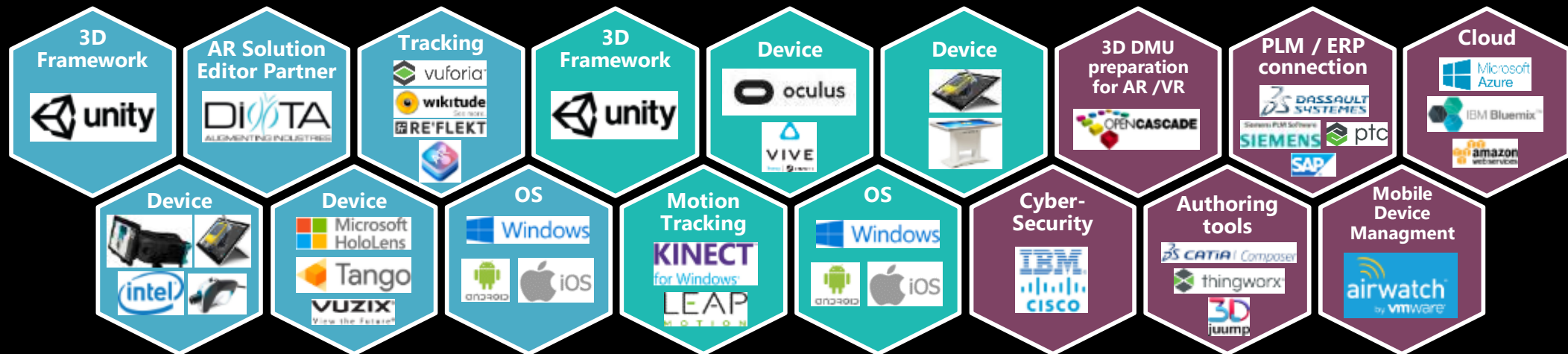
ONE DEDICATED TEAM
More than **300** people
(France, Germany, Netherlands, UK, US, India)

Capgemini

🌐 www.capgemini.com
www.capgemini.com/digital-manufacturing

Our AR/VR/MR Competence Center is based on strong technical skills in 3D applications development and industrial integration, leveraged by a comprehensive ecosystem of partners, Group IP and Platforms

3D Framework	AR Solution Editor Partner	Tracking	3D Framework	Device	Device	3D DMU preparation for AR /VR	PLM / ERP connection	Cloud
Device	Device	OS	Motion Tracking	OS	Cyber-Security	Authoring tools	Mobile Device Managment

Augmented/Mixed Reality **Virtual Reality** **IS / IT integration and Industrialization** Capgemini

Some of our mixed reality credentials

Aerospace

Holographic academy *AR/VR developments:*

- A350 Cockpit Harness Mounting
- Aircraft Cabin Configurator
- Training for newcomers…

Space

Projective augmented reality to support satellites assembly phase:

- DMU data reuse
- Diota technology integration for 3D tracking
- Projection for free hands use
- Reporting…

Automotive

Assembly training for car dashboards (HoloLens/3D tracking/Surface Pro):

- Unity multi-platform application dev.
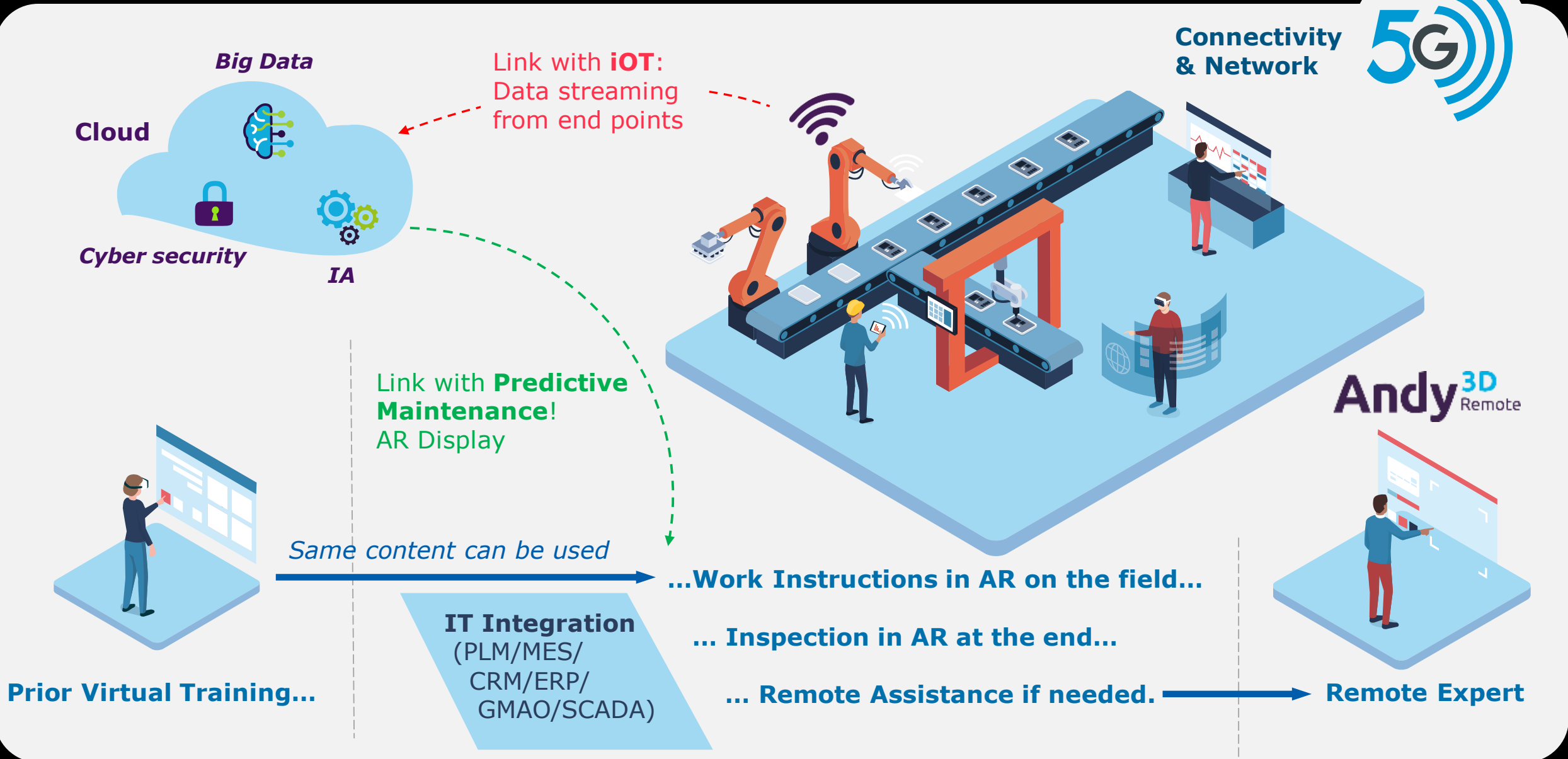- Step by step mounting display
- Completely Configurable

Automotive
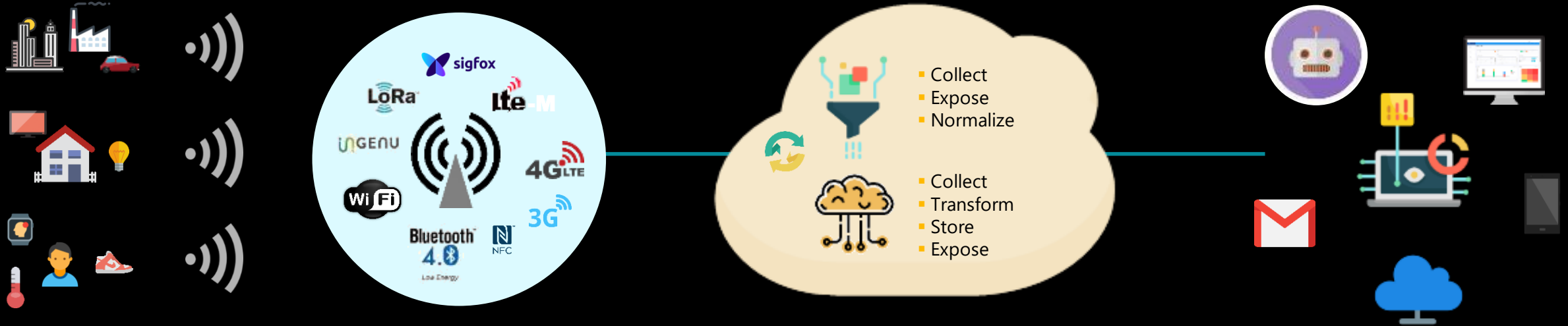
Cabling Inspection in Augmented Reality (HoloLens):

- A lot of different configurations
- Improve efficiency
- Reduce error rates, time, costs & expertise dependency

https://www.youtube.com/watch?v=_sVmJEihFD0

https://www.youtube.com/watch?v=V0WrCf8PbEk

Link with other key technologies

Big Data

Cloud

Cyber security

IA

Link with **iOT**:
Data streaming
from end points

Connectivity
& Network

5G
3D Remote
Andy

Link with **Predictive Maintenance**!
AR Display

Same content can be used

...Work Instructions in AR on the field...

IT Integration
(PLM/MES/
CRM/ERP/
GMAO/SCADA)

... Inspection in AR at the end...

Prior Virtual Training...

... Remote Assistance if needed.

Remote Expert

IoT value chain

IoT devices　　　　**Connectivity**　　　　**IoT Platform & Data Management**　　　　**Visu + Analytics IS Integration**

- Collect
- Expose
- Normalize

- Collect
- Transform
- Store
- Expose

Security & Privacy by design

HW Manufacturers　　　　Telco Operators　　　　IoT platform solution (PaaS + SaaS)
Data Management
Capgemini

Cloud provider (IaaS)

IS + Verticals
IS/IT
Capgemini

Our approach & differentiators

End-to-end Product Design & Engineering capabilities across the **Connected Product value chain** for **Safe** & **Secure Product**

Rapid Time to market using our **Assets,** tools, platforms, and accelerators across life cycle from **conceptualization to operations.**

Deep Domain expertise & ability to **effectively cross pollinate solutions** and leverage skills & assets across sectors for innovative solution development with **Improved ROI**

Quality and Domain Centric Certifications like ISO 13485, ASPICE level 3 for **assured compliance to statutory & regulatory** requirements globally

Access to industry best technology solutions via **Global network** of **partners across the Connected products value chain**

Key Partnerships

Microsoft Azure

ptc

IBM

amazon web services

CISCO

DELL

intel

Schneider Electric

Key Assets

| DMP | Migration Factory | X-IoT | Jarvis | Configuration Manager | Andy3D | Hawdi |

Our offerings

- **Roadmap**

- **IoT corporate strategy & ambition**

- **Business Case / Model**

- **Sourcing / Partnerships**

- **Operating model**

- **Governance**

- **Industrialisation**

#Strategy

#Business transformation

#Technologies, Security & Privacy

#Innovation & design

- **Hackathon**

- **Design thinking**

- **Proof of Concept**

- **User experience / Client journey definition**

- **IoT Platform**

- **Security audit**

- **Connectivity**

- **Data analytics**

Strong IoT credentials in various industries

TOTAL – IoT platform for industries

TOTAL has deployed IoT solution to monitor industrial assets for RC – EP – MS.

The challenge now is to deploy a device management solution to industrialize the solution

Capgemini deploys the Device Management Solution- X-IoT- integrated in Azure IoT bricks to provide an end to end IoT solution in an industrial context

The Ingestion platform aims to enable a secure, reliable, industrialized, agile and easy data collect from IoT sensors deployed on industrial assets or other assets of the group
The IoT Ingestion Platform is an entry point and gateway between IoT devices and the Information System
The platform should provide all the necessary features to handle the complexity of connecting, managing IoT devices at scale
Proper management and versioning of the schema describing both the properties of devices and the content of messages
- Reliability, scalability and services for final customers is disrupted according huge hotline and support costs.

The solution provided by Capgemini is :
- Full architecture based on our X-IoT platform: hardware, protocols and communication, cloud to identify bottleneck
- Mitigation action and roadmap following several scenario, short- and long-term solutions.
- Pilot project for technical validation :
  - o The solution is hosted on Microsoft AZURE cloud infrastructure
  - o Data is collected using secured MQTT protocol
  - o The device management is provided by the Capgemini XIoT platform
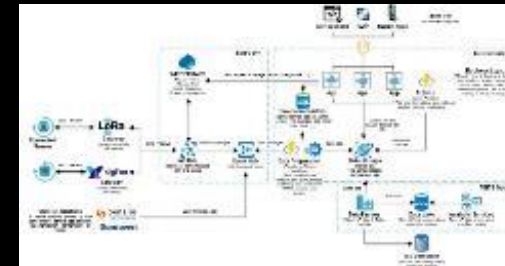 - o X-IoT integrates a Lora Server & Sigfox connector to manage LPWAN network.

Securing: allow to gather data from industrial devices deployed in refinery

Manage data flows & devices: providing firmware update and devices management

Performance: Build a scalable Architecture able to manage the ramping up

Q/A

About Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of over 200,000 team members in more than 40 countries. The Group reported 2018 global revenues of EUR 13.2 billion.

Learn more about us at

www.capgemini.com

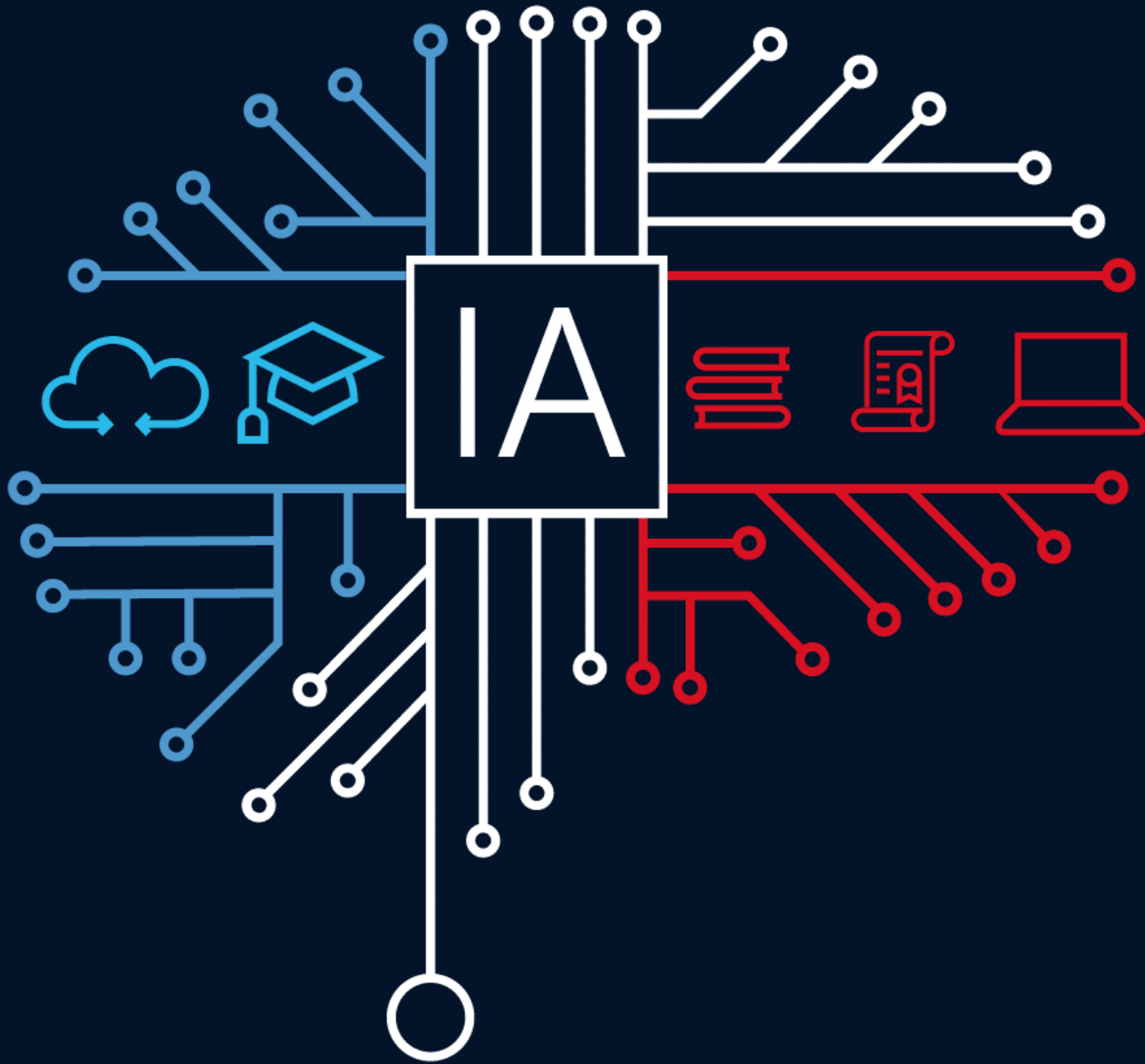**People matter, results count.**

Marie-J. PECOULT

Andy3D Remote Product Owner

Digital Engineering & Manufacturing Services

Mob.: + 33 (0) 7 60 53 20 89

marie-Julie.pecoult@capgemini.com