One Platform for Industrial Digitalization

Accelerate your digital transformation with private wireless and mission-critical industrial edge

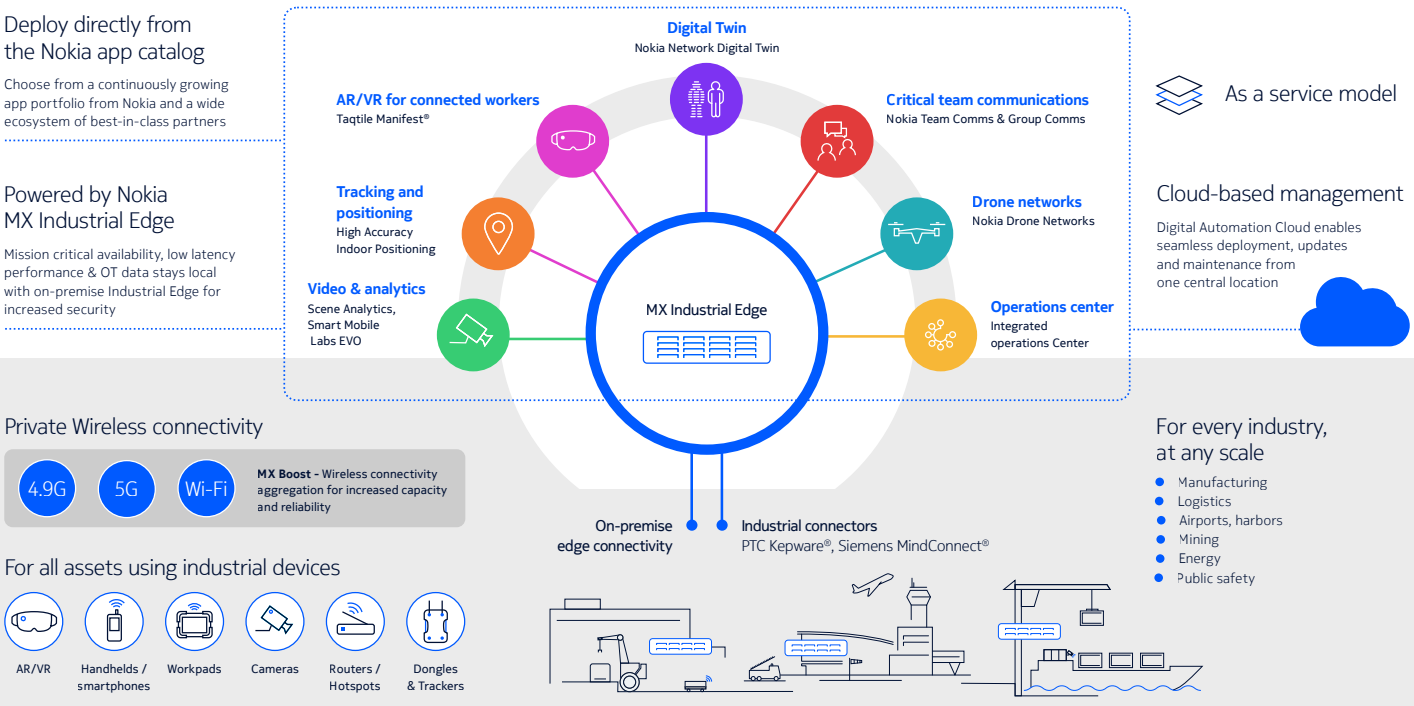
Accelerate digital transformation

Digitalization is essential to achieve higher operational efficiency, safety and sustainability. Technological advances under the umbrella of Industry 4.0 are enabling companies to become data-driven and to adopt zero touch automation to transform their operations.

Connecting industrial assets and transforming data into insight is not straightforward. New and legacy technologies must work as one seamlessly together, while machines, people and processes must be connected to provide the data-driven insights that underpin more agile, higher quality and proactive operations.

Nokia One Platform for Industrial Digitalization is designed to simplify digital transformation for industries and deliver secure, reliable and high-performing wireless infrastructure.

The platform includes industrial-grade private wireless connectivity, certified ruggedized industrial devices, on-premises edge compute for mission-critical data processing and an application ecosystem to support Industry 4.0 use cases. It interfaces with legacy technology and the pre-integration enables industries faster digital transformation and lower total cost of ownership.



Simplifying digital transformation by enabling connectivity, industrial devices, Industrial Edge and applications to work as one

Private wireless networks to connect every asset

Only a limited number of production or factory equipment is connected. IT solutions are often incompatible with the needs of operational technologies (OTs) based on complex industrial protocols, fragmented systems environments and high availability requirements. Such issues hamper the efforts of industries to accelerate digital transformation and adopt new applications and devices without disrupting productivity. Private wireless connectivity can overcome the barriers and accelerate digital transformation.

11.4 million

sites globally will benefit from Industry 4.0 applications powered by a private wireless network and Industry Edge to transform their operations.

Harbor Research, June 2022

A private wireless network typically provides reliable, pervasive connectivity to one business or organization. It is a key enabler for the automation and digitalization of the organization's business through applications, like autonomous robots, for more efficient, sustainable and secure operations.

Dedicated cell sites and core network servers support the organization's needs, freeing it from the limitations of public cellular networks. Private wireless networks are ultra-reliable and ensure production processes can be connected and digitalized without the worries of network failure or performance limitations.

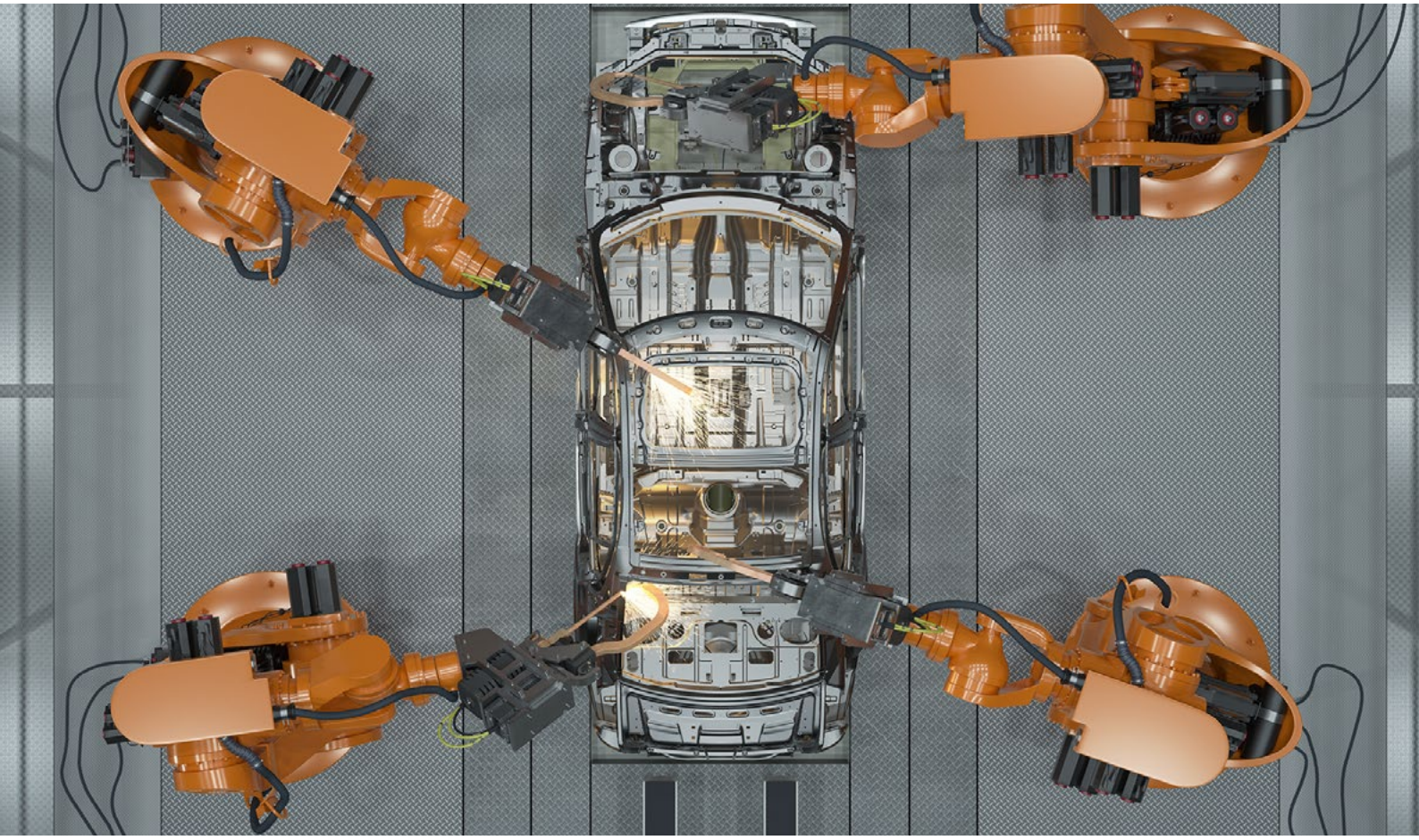
A comprehensive platform

Yet **private wireless technology** is new to many organizations who may fear long integration processes or complex operations. The Nokia One Platform for Industry 4.0 transformation, together with Nokia's decades of industrial experience, tackle such doubts.

The Platform comprises of industrial-grade private wireless connectivity options including Nokia Digital Automation Cloud (DAC), Modular Private Wireless (MPW) and Wi-Fi, MX Industrial Edge (MXIE), Nokia industrial devices and a catalog of our own and third-party applications.

- **Nokia Digital Automation Cloud** offers a compact, easy-to-deploy plug-and-play, as-a-Service industrial digitalization solution for industrial campuses.
- **Modular Private Wireless** enables fully customized private wireless networks to be built for very demanding use cases and field area networks.
- **Nokia MX Industrial Edge** maintains OT data on-premises and provides enterprises with 'click and deploy applications like mixed reality, automation, data aggregation and video analytics onto the on-premises edge.

The end-to-end solution is provided as-a-service, and is mainly bought as a subscription, reducing upfront capital investments and allowing enterprises to scale as they grow.



The right technology mix for any organization

Industries are increasingly reliant on wireless technologies to connect assets. Private wireless is gaining traction for mission-critical and business-critical OT applications. It will eventually become the dominant connectivity choice complementing Wi-Fi's basic connectivity for non-mission-critical processes.

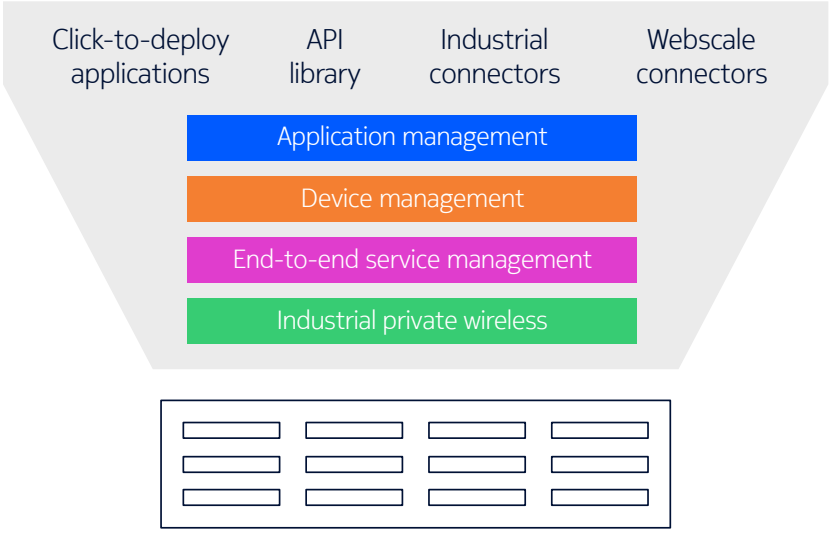
Nokia's private wireless solution includes **Nokia DAC Wi-Fi** to bring the combined benefits of the newest Wi-Fi generation and seamless interworking with private wireless. This is a true end-to-end solution, with OT applications and devices connected to the same platform, giving industries the best connectivity option.

Future-proof, mission-critical OT digitalization

Nokia MX Industrial Edge (MXIE) is an on-premises, off-the-shelf, plug-and-play and scalable edge as-a-Service solution offering organizations an easy entry point, scalability and full control over their data. It combines workload lifecycle management and simplified IoT integration with high capacity, performance, resilience and security to meet the needs of mission-critical connected OT use cases.

Nokia and leading industrial partner software plug-ins enable disparate industrial systems to connect to the network and communicate between themselves, as well as with other systems such as digital twins, Manufacturing Execution Systems, predictive maintenance or analytics. These can run either locally on MXIE or on webscale providers' cloud resources like Microsoft Azure IoT Hub.

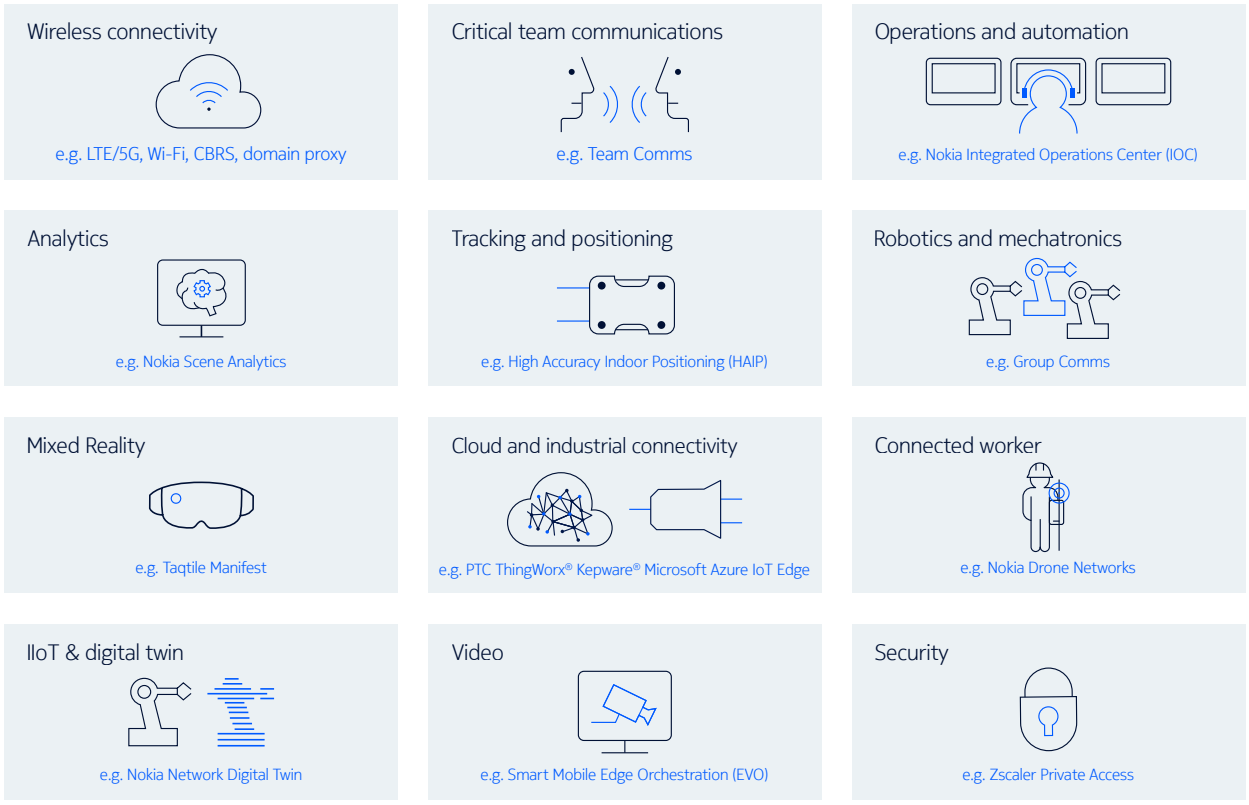
MX Industrial Edge addresses Industry 4.0 applications that require high performance at the network edge, as well as tight integration with industrial systems and networking solutions. This means operational technology (OT) processes and applications can be better managed, for example real-time control of robots is achieved through low latency, edge connectivity on premise. The low latency the industrial edge provides is not possible with a remote cloud.



The ecosystem-neutral industrial edge

Autonomous robots, Autonomous Guided Vehicles (AGVs), computer vision-based video analytics and many more applications are at the forefront of change. But these applications only truly deliver with the right connectivity mix and network infrastructure. That's why Nokia has combined in a single platform all the capabilities needed for highly effective performance.

A variety of applications are available from the Nokia DAC catalog and selected verticals to enable digital transformation. Enterprises can choose Nokia applications such as **High Accuracy Indoor Positioning (HAIP)** and **Team Comms**, as well as **applications and industrial connectors from leading companies** in industrial automation such as PTC, Microsoft, Taqtile and Smart Mobile Labs.



The most common Nokia DAC applications deployed on MX Industrial Edge

Certified industrial devices for a more flexible workforce

While there is growing demand for 5G industrial devices able to access private wireless networks, there are more than 6,800 LTE [1] enabled non-phone devices and many industrial systems with built-in 4.9G/LTE modems. 85% of industrial [2] use cases can already be supported by 4.9G/LTE.

Nokia industrial devices offer:

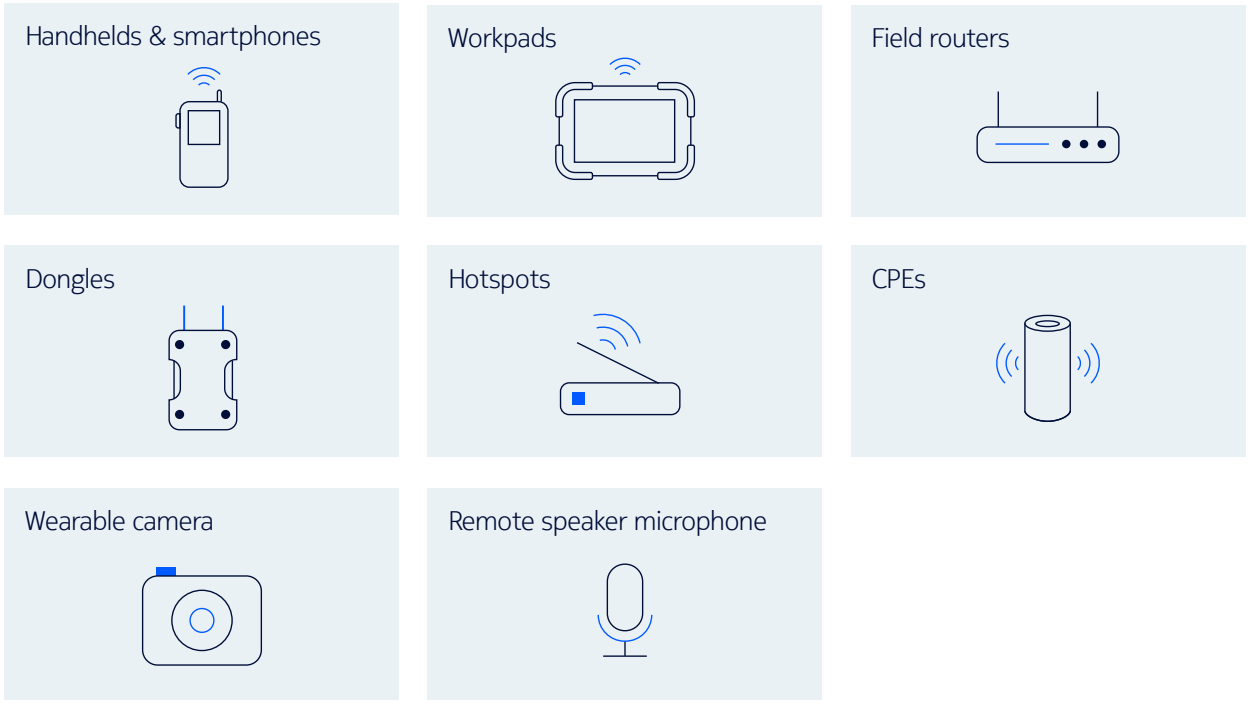
- Standard dongles, indoor and outdoor field routers, CPEs (customer premises equipment) with fixed wireless access and hotspots to connect legacy technology, cameras and accessories
- Full integration with Nokia Digital Automation Cloud (DAC) and Modular Private Wireless solutions
- Zero-touch onboarding, easy to use device management and plug-and-play operation
- Integrated Nokia or third-party applications
- State-of-the-art handhelds for heavy use (IP68 rating)

A wide range of devices is available from Nokia

[1-2] Nokia Whitepaper – Industrial-grade private wireless, 2020

Rugged industrial devices can be provided as a service to meet the needs of a changing and dynamic workforce. Devices feature high IP protection levels and industrial-grade components and are certified in line with industrial and regional requirements. Some devices support industrial protocols like PROFINET, OPC-UA, EtherCAT and Modbus for integration with legacy systems.

All Nokia devices come with smart management tools and communication applications for Nokia Private Wireless solutions. This integrated approach helps boost productivity by ensuring workers and machines can quickly and easily share information.



Many device types are available to suit the needs of industrial users

Multiple types of devices are available to connect machines, sensors and people:

- **Handhelds** and **smartphones** offer push-to-talk, push-to-video and access to live data
- **Workpads** provide a larger interface to manage operations and run applications. They can also be vehicle mounted
- **Field routers** to connect to complex systems and support industrial protocols like PROFINET, OPC-UA, EtherCAT and Modbus
- **MulteFire routers** for private wireless networks operating in unlicensed spectrum
- **Dongles** for vehicles, robots and PC-based solutions
- **Hotspots** for connecting Wi-Fi equipment to private networks
- **CPEs** for fixed wireless access connectivity

More than just Industry 4.0 connectivity - Nokia Industrial devices and applications deliver the highest value from private wireless networks

In addition, cameras help to monitor premises and production lines, with analytics using visual data to bring intelligence to surveillance and quality control. Wearable cameras, remote speaker microphones and other accessories make it easier for employees to communicate efficiently.

Blueprints to simplify digital transformation

Working with partners is essential to accelerate industrial digital transformation. Organizations can gain huge benefits by working with Nokia OT digital architects and industry segment experts that understand their operations.

Nokia's 10 years of industrial experience has enabled us to develop industry-specific blueprints to guide the digital transformation of enterprises in sectors such as automotive, airports, logistics, manufacturing, port terminals, power utility and deep or open pit mining.

These blueprints build on best practices to encompass the applications, edge computing capabilities, devices and wireless connectivity options needed to transform sites while keeping mission-critical processes running.

Our blueprints also provide a clear view of the return on investment for digital transformation. This makes it easier for you to move forward and get the right business approvals in place.

Nokia's unrivalled industrial experience

Nokia is the market leader in private wireless with 30 years of critical connectivity experience. We deployed the world's first private 4G/LTE wireless solution in 2012 and launched the world's first standalone private 5G network in 2020.

Our segment teams come from different industries like mining, port operations, processing and automotive manufacturing. They have created blueprints and services matched to these industries. The blueprints show how to deploy a flexible range of devices and applications with the right connectivity mix for maximum security, reliability, flexibility and interoperability while reducing energy consumption and carbon footprint.

Global partnerships make Nokia the trusted market leader by hundreds of organizations for Industrial-grade 4.9G/5G private wireless and industrial edge.

Nokia offers

Industrial Edge

that caters for a neutral partner ecosystem

Industrial devices

as-a-service for flexibility and scalability

End-to-end digital platform

including private wireless and Wi-Fi connectivity, Indusrial devices, Industrial Edge and applications catalog

Deep industrial expertise

to provide clear business outcomes including productivity, safety and sustainability for high ROI

An as-a-service solution

to make it easier to deploy, operate and integrate with legacy environments

Nokia OYJ
Karakaari 3
02610 Espoo
Finland

CID: 212765

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering the future where networks meet cloud to realize the full potential of digital in every industry.

Through networks that sense, think and act, we work with our customers and partners to create the digital services and applications of the future.