AI Sprint Project Introduction
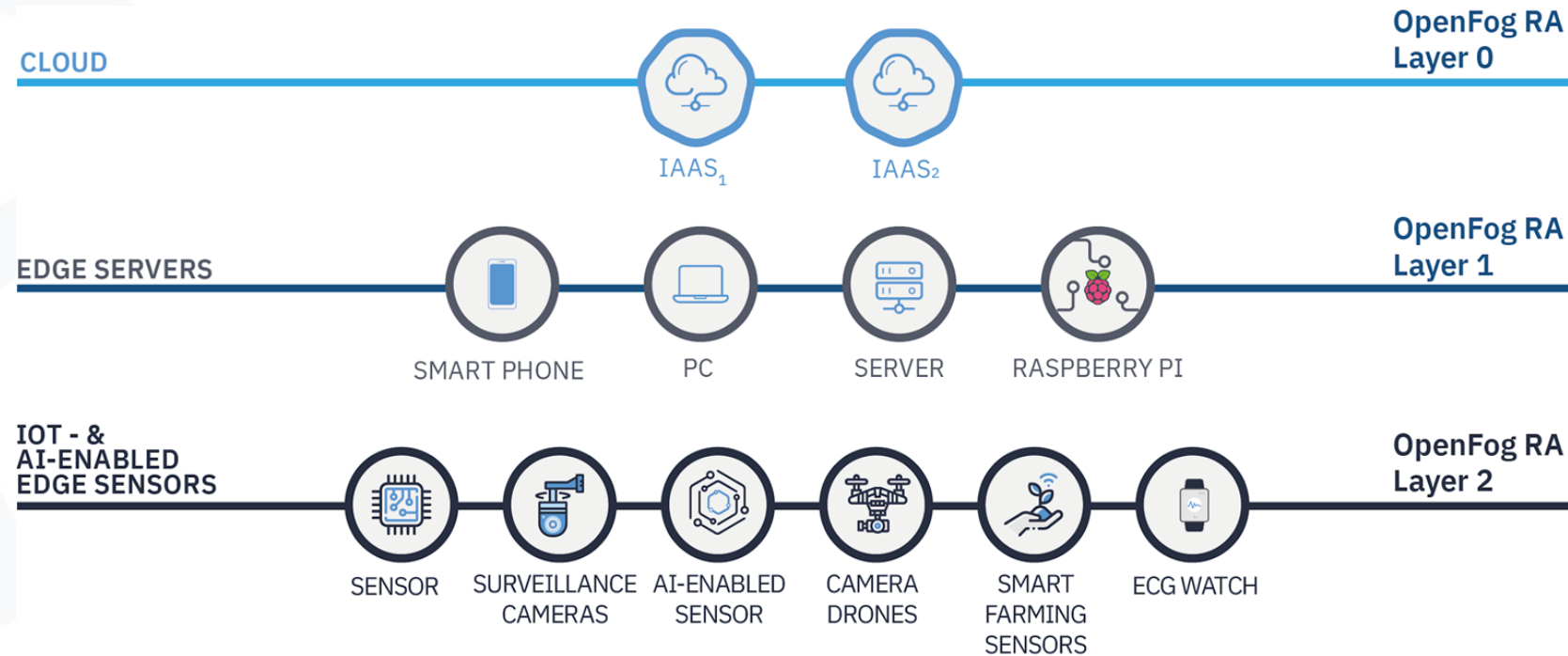
Danilo Ardagna – Associate Professor, Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria

- By 2026, AI worldwide market will approach $900 billion (CAGR 18.6%[1]) while edge computing will reach $324 billion (CAGR 13.6%[2])

- AI needs resources at the edge of the network

- New challenges from the infrastructural perspective

[1]IDC Semiannual Artificial Intelligence Tracker, July 2022

[2]IDC Worldwide Edge Spending Guide, August 2022

CLOUD — IAAS₁ — IAAS₂ — OpenFog RA Layer 0

EDGE SERVERS — SMART PHONE — PC — SERVER — RASPBERRY PI — OpenFog RA Layer 1

IOT - & AI-ENABLED EDGE SENSORS — SENSOR — SURVEILLANCE CAMERAS — AI-ENABLED SENSOR — CAMERA DRONES — SMART FARMING SENSORS — ECG WATCH — OpenFog RA Layer 2

- Simplified programming models

- Automated deployment and dynamic reconfiguration

- Secure execution of AI applications

- Highly specialized building blocks for distributed training, privacy preservation and architecture enhancement

H. Sedghani, et. al. Advancing Design and Runtime Management of AI Applications with AI-SPRINT. AIM 2021 Workshop Proceedings

https://www.ai-sprint
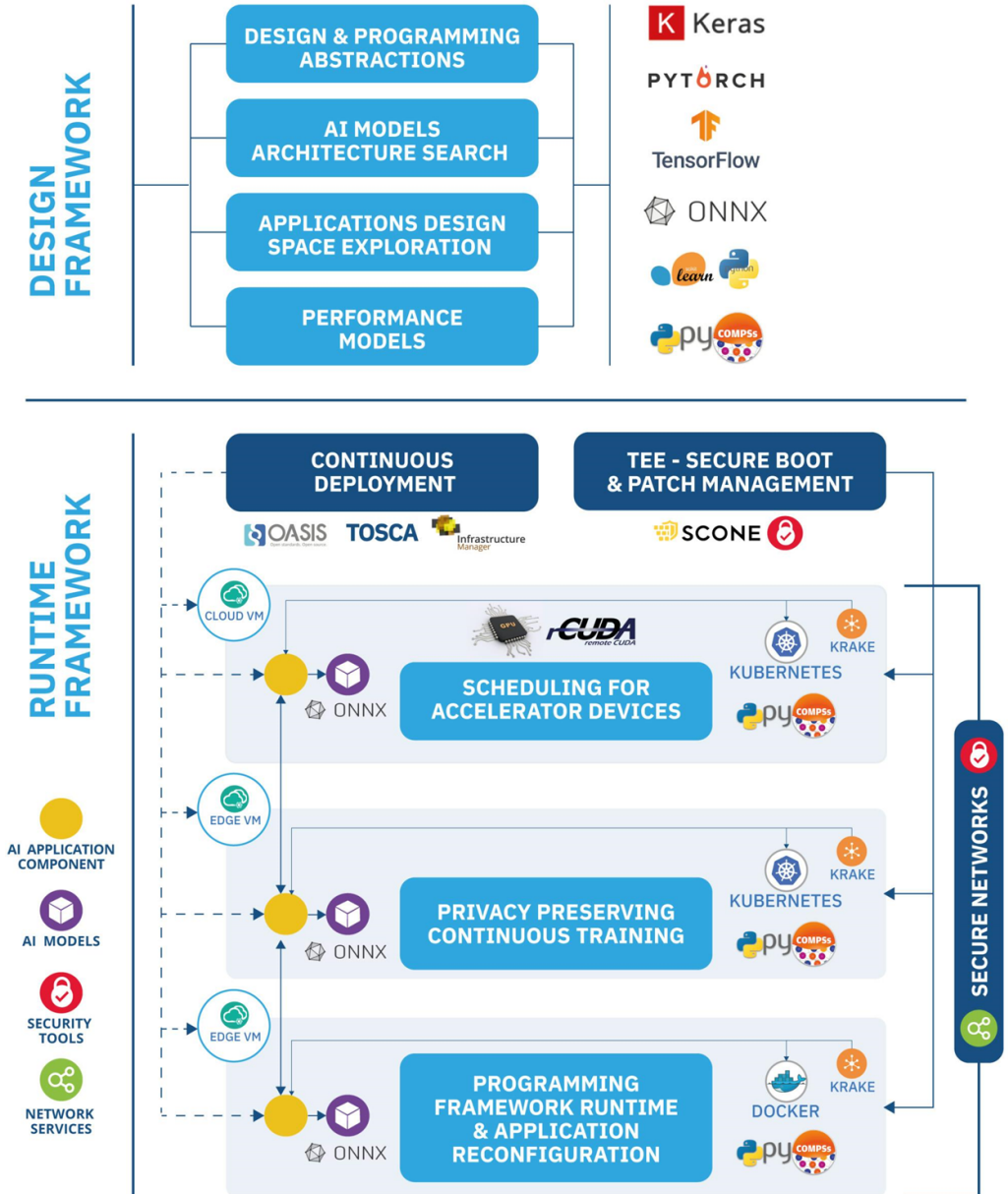
European Edge Market Outlook

Alexandra Rotaru – Senior Research Analyst, IDC Europe

IDC defines edge as a **distributed computing paradigm** that includes the deployment of infrastructure and applications outside of centralized datacenter and public clouds closer to **where data is generated and consumed**. Edge is an essential element for digital business, with workloads residing across the continuum of core, edge, and endpoint locations.

Public/Private infrastructure

Core

Edge

Endpoints

12/11/2022
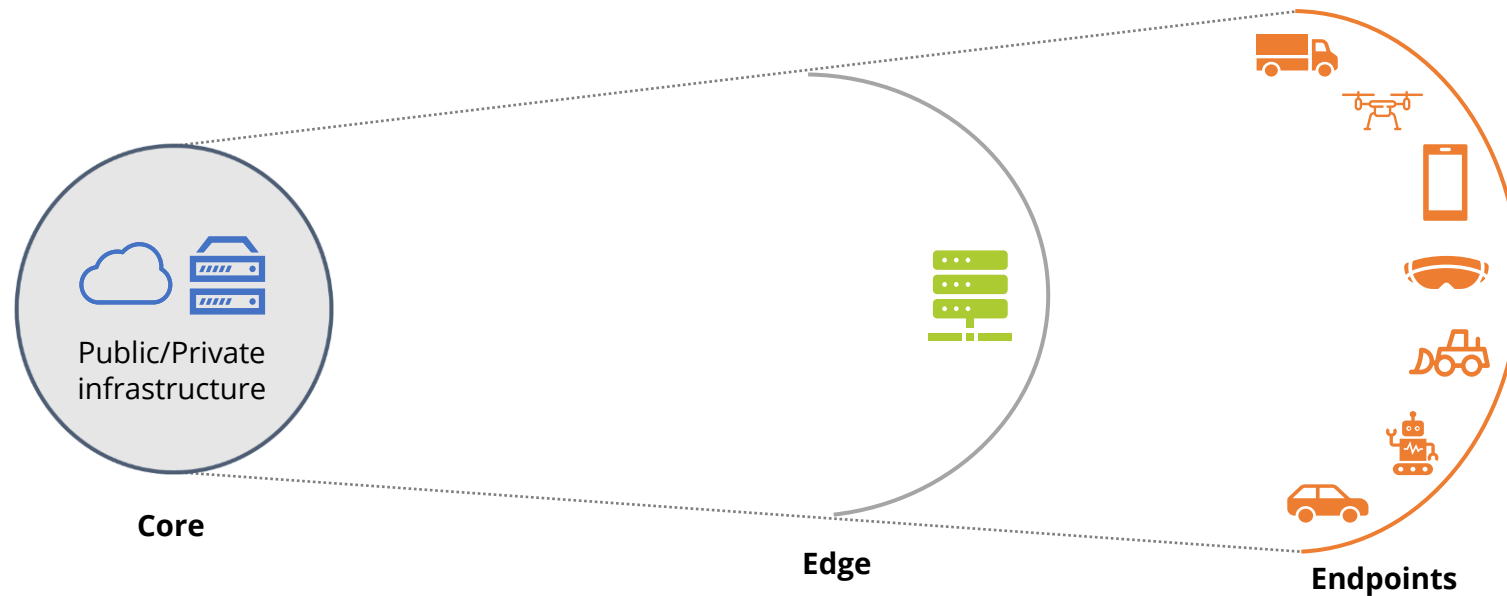
Which one do you think is the <u>overarching business goal</u> driving edge adoption?

1. Cost
2. Innovation
3. Performance
4. Growth

12/11/2022

1 in 3

European organizations are already using edge technologies and this number is expected to **double** over the next two years

Business Goals Driving Edge Adoption

1. PERFORMANCE
2. INNOVATION
3. COST & EFFICIENCY
4. GROWTH
5. CYBERSECURITY
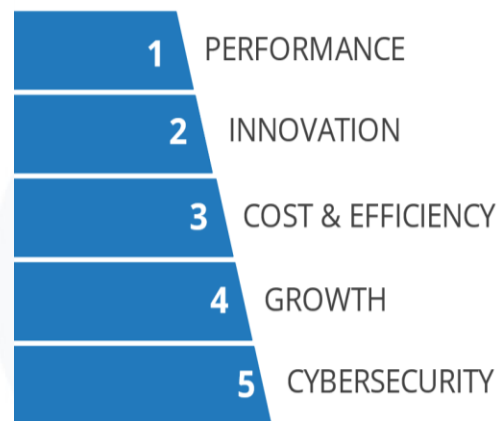
Others included reorganization, regulations, ecosystems, customers, accessibility, physical security, marketing, workforce, corporate social responsibility.

Source: IDC's European Emerging Technologies Survey July 2021 (n = 365)

Measurable Results Achieved With Edge Adoption

- 44% Process quality
- Product/service quality
- Time efficiency
- Revenue growth
- Cost reduction
- Customer satisfaction
- 25% Launch of new products/services

European **Enterprise Edge spending** in Europe approaching

$33B

Cloud Services* (by 2026)

23%

Artificial Intelligence* at the edge (by 2026)

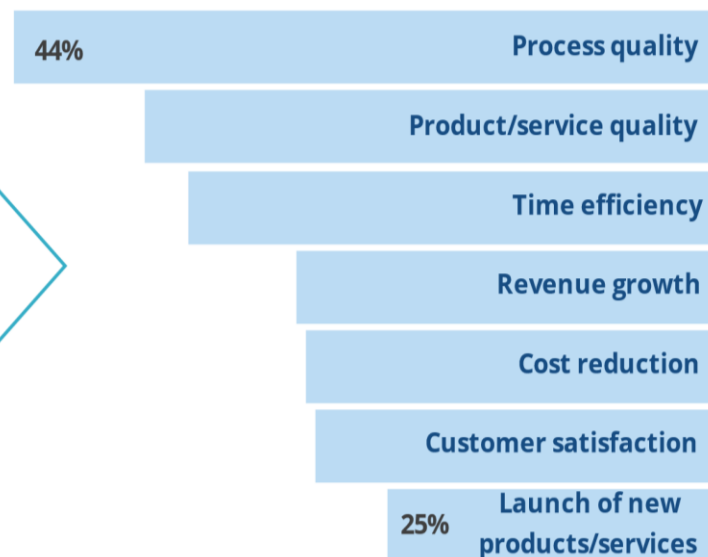# 12%

*share of total Enterprise Edge spending

Edge is the platform closing the gap between emerging technologies (such as IoT, AI) and more traditional technology (such as cloud), supporting new architectures, enabling multiple connectivity standards, real-time analytics and AI on data, reducing latency and ensuring privacy and trust with distributed solutions.

AI and IoT are driving most of the investments, as edge is becoming the preferred environment where both technologies could be deployed and applied.

Significant drivers are driving the spending.

Latency

Limited connectivity
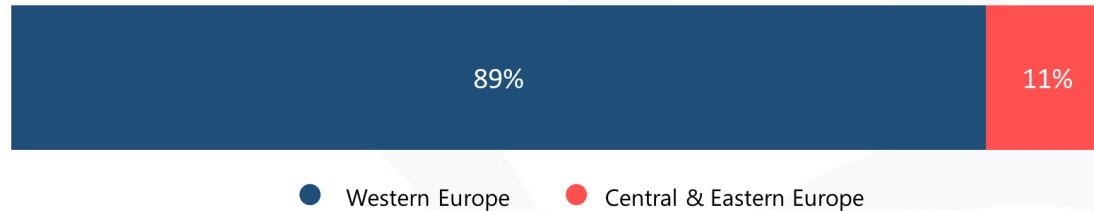
Scalability

Cost

Security & compliance

Real-time analytics

Improved decision-making

Performance

Geography View

89%	11%

● Western Europe   ● Central & Eastern Europe

Different nuances of adoption across the two regions of Europe

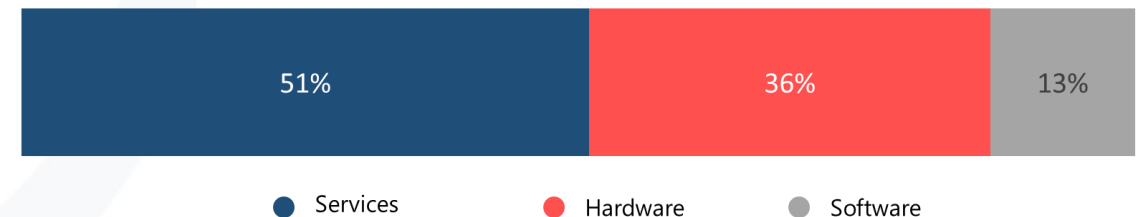Western European market is **far more advanced** in adoption

Edge computing market in Central and Eastern Europe will **gain more importance** in the next couple of years
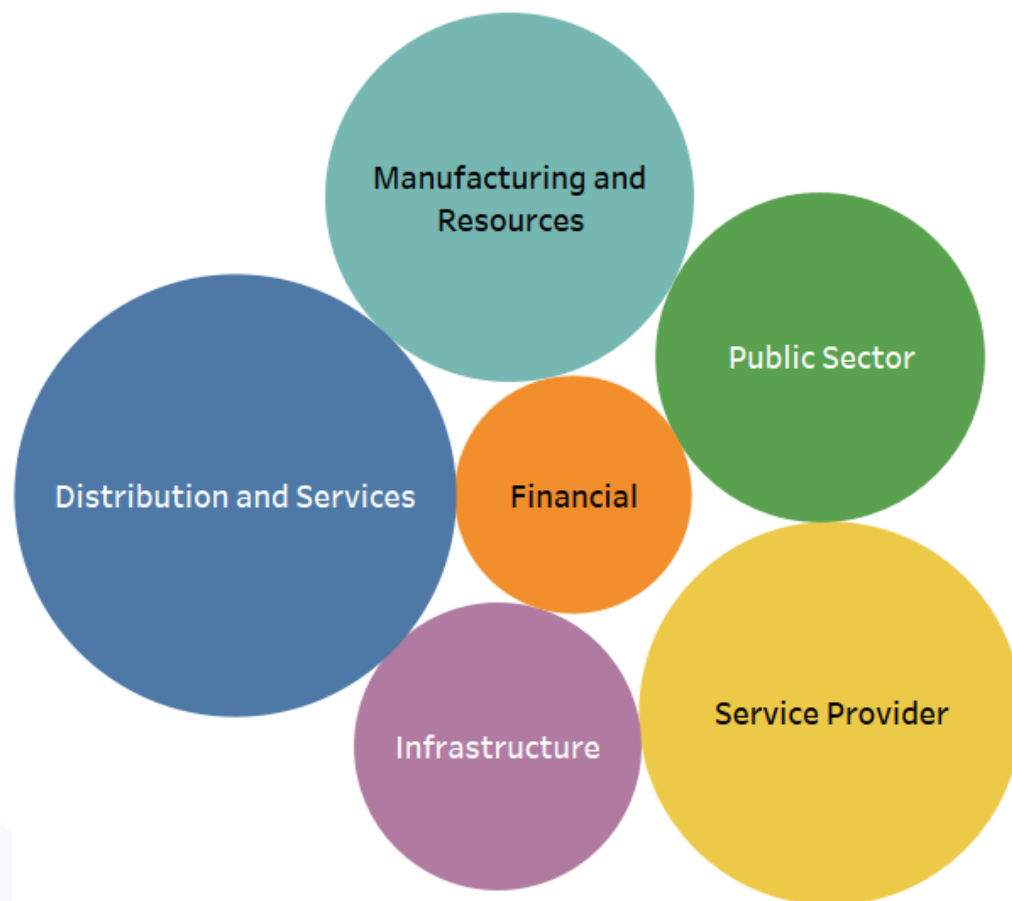
Services represent the largest and fastest growing area, being crucial for AI deployments at the edge

Hardware is the foundation on which AI can realise tremendous capabilities on training, inferencing and running advanced AI systems.
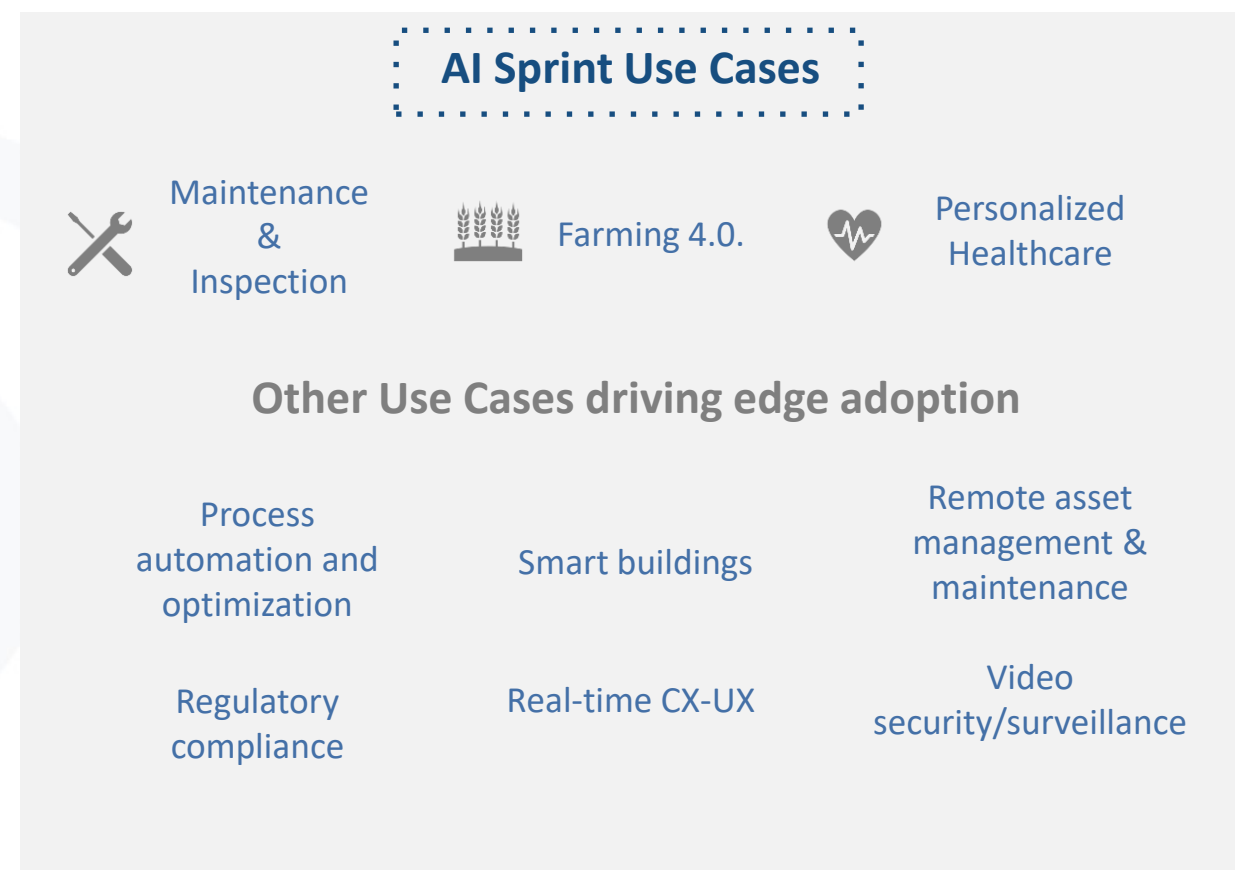
Analytics and AI software supports the analysis and the use of data

Technology View

51%	36%	13%

● Services   ● Hardware   ● Software

Source: IDC Research - IDC WW Edge Spending Guide, August 2022.

In Europe, edge computing has **different adoption paces across the main sectors**, driven by **innovation, performance and cybersecurity** as the main business goals steering organizations' edge investments in 2022 and beyond.

AI Sprint Use Cases

Maintenance & Inspection

Farming 4.0.

Personalized Healthcare

Other Use Cases driving edge adoption

Process automation and optimization

Smart buildings

Remote asset management & maintenance

Regulatory compliance

Real-time CX-UX

Video security/surveillance

Source: IDC Research - IDC WW Edge Spending Guide, August 2022

1 **Edge is the key enabler for AI performance delivery**

High computational and storage capabilities found at the edge can enhance AI deployments by **processing data in real time**, easily extracting critical pieces of information, structure this information and finally connecting the dots around it in order to transform the most valuable data into actionable insights.

2 **Edge computing is bridging the gap between cloud and AI**

The convergence between edge, cloud and other emerging technologies (such as AI, IoT, AR/VR etc) has the potential to **enable a continuum of computing and storage capabilities** from the cloud to the most remote parts of networks where endpoints are located.

3 **Security and privacy at the edge**

By moving **AI capabilities to the edge, organizations can benefit, besides from low latency and time and cost reduction for data transmission to the cloud, of increased security and privacy**. With data being an organization's most valuable asset, understanding how data is being collected and stored is critical.

4 **Different use cases are driving increased edge adoption**

Use cases such as remote asset management and maintenance, process automation and optimization, smart buildings, customer and use experience, video security and surveillance are key areas where European organizations will use edge.

More information: https://goto.webcasts.com/starthere.jsp?ei=1580301&tp_key=1d11506369&sti=social