

Edge computing: Service provider business models and the AI/ML opportunity

STL Partners webinar

Wednesday 19th July

In partnership with:

**TELCO
SYSTEMS**

STL PARTNERS

Agenda

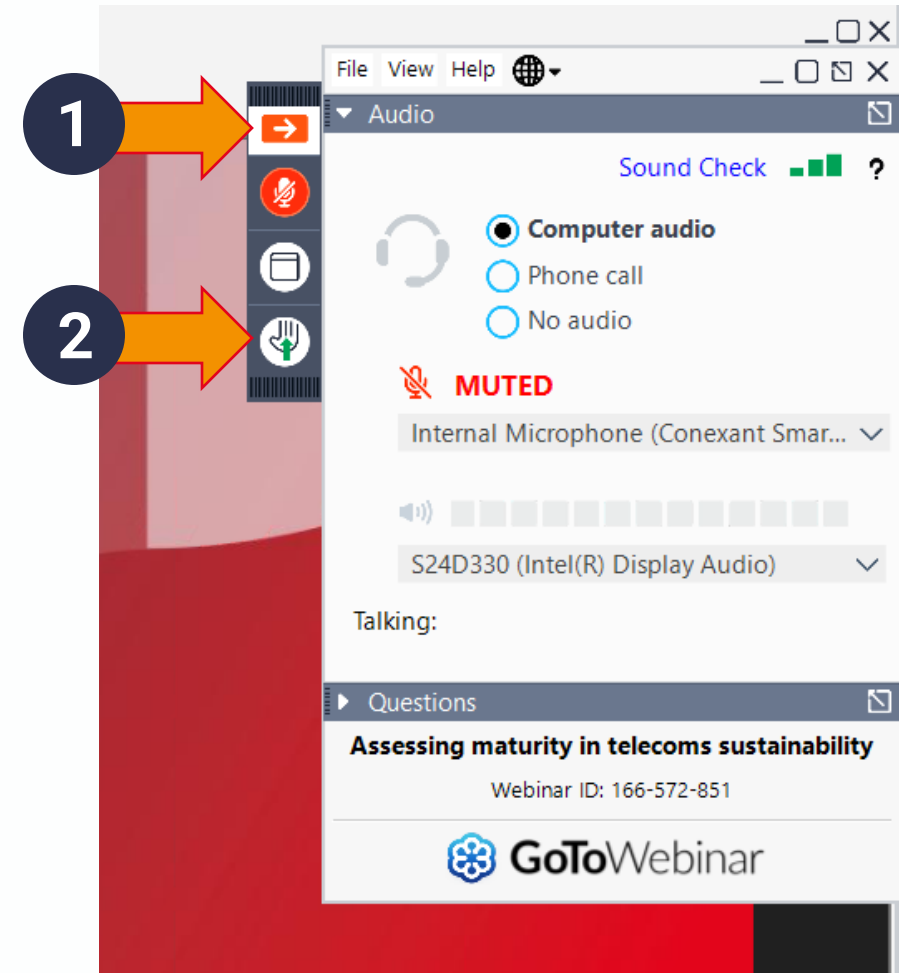
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|----------|---|---------|
| 1 | Introductions and housekeeping | 5 mins |
| 2 | How service providers can monetise edge | 10 mins |
| 3 | Challenges in delivering AI applications | 10 mins |
| 4 | Panel discussion and Q+A | 35 mins |

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GoToWebinar

- You're in listen only mode
- If you need us, please type a comment
- Feel free to type questions throughout the session for the Q&A at the end
 - Any questions that we don't answer live will be answered offline and shared in a summary Q&A document
- We'll send you the slides and a recording shortly after the session, please do share with colleagues



Our speakers today



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Senior Consultant

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FAISAL IMTIAZ

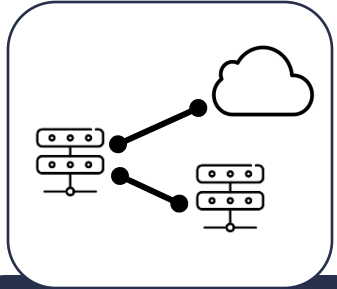
CEO

**Snappy Internet &
Telecom**

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We have found there are five types of B2B services that service providers can consider for monetising edge



Edge-to-cloud networking

Optimising connectivity between devices or premises to edges and clouds seamlessly and securely



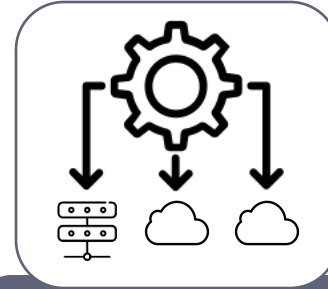
Private edge infrastructure

Providing on-premises edge clouds for customers – may be in conjunction with private mobile network



Network edge platforms

IaaS / PaaS-type platforms to allow customers to use (shared) edge cloud resources, plus services to enhance applications



Multi-edge & cloud orchestration

Services to better monitor and manage network and application workloads across edges and clouds (private and public)



Vertical solutions

End-to-end solutions, combining networking, edge computing, applications and services

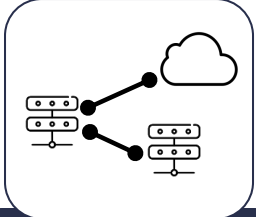


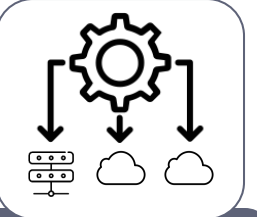

Connectivity

Infrastructure

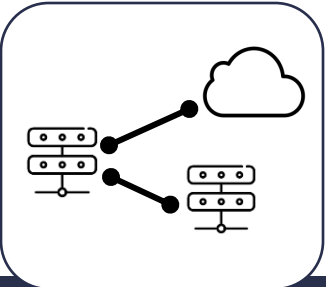
Application enablement

Applications & solutions

Different types of service providers are more/less likely to offer these services

	 Edge-to-cloud networking	 Private edge infrastructure	 Network edge platforms	 Multi-edge & cloud orchestration	 Vertical solutions
(Traditional) telcos	✓	✓	✓		
Systems integrators		✓		✓	✓
Managed service providers	✓		✓	✓	
Original equipment manufacturers (OEMs)					✓

Edge-to-cloud networking allows SPs to optimise connectivity between devices or premises to edges and clouds

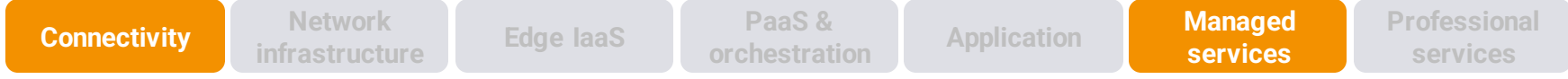


Edge-to-cloud networking

Optimising connectivity between devices or premises to edges and clouds seamlessly and securely

Connectivity-first model

Which roles are the service provider doing for this?



✓ Opportunities for service providers

- Ability to meet the more stringent requirements of edge applications and customers
- Increased degree of network automation and customisation by leveraging AI and analytics
- Enables SPs to scale services more effectively and efficiently handle increasing data volumes

Challenges for service providers ✗

- Increased complexity in network architectures
- Complexity of managing and processing data across distributed edge and cloud resources

Live use cases

CityFibre is working with Telco Systems to virtualize their network with advanced edge compute infrastructure

CEMEX is working with Telco Systems to enable seamless managed connections between their facilities worldwide

Solution providers with a level of vertical expertise can offer full end-to-end solutions



Vertical solutions

End-to-end solutions, combining networking, edge computing, applications and services

Applications and solutions model

Which roles are the service provider doing for this?

Connectivity

Network infrastructure

Edge IaaS

PaaS & orchestration

Application

Managed services

Professional services

✓ Opportunities for service providers

Moving up the value chain to become a one-stop-shop for a full edge-enabled solution

SPs can position themselves as industry experts and differentiate their services in the market

Solves real business problems for enterprises, which can make business case to adopt easier

Challenges for service providers ✗

Good understanding of the needs and pain points of the vertical sector they are targeting

Need to have strong relationships in the vertical and be a credible solution provider

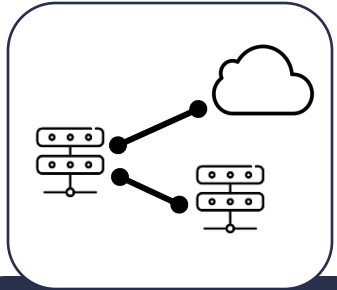
Integrating with enterprise systems

Live use cases

AWS offers services including facial recognition, real time situational analysis and object/threat classification with its MEC platform

Verizon and Atos are partnered to provide a computer vision solution which spans numerous use cases

An example of a telecoms operator playing across all types of edge services is Verizon



Edge-to-cloud networking

verizon

Already offering virtual network services (using on-prem CPE) and Secure Cloud Interconnect



Private edge infrastructure



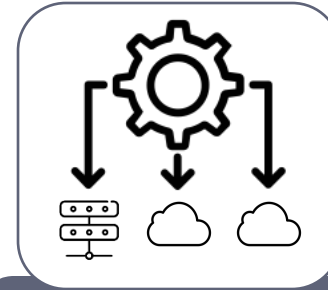
Partnerships with Nokia, AWS and Microsoft for private 5G / edge, plus Celona (incl. investment)



Network edge platforms



Partnership with AWS allows developers to access Verizon network edge through Wavelength



Multi-edge & cloud orchestration



Kubernetes-as-a-Service platform (Rafay) and recently 'Verizon 5G Edge Developer Portal' (freemium model)



Vertical solutions



In-house, e.g. Envrmnt (AR/VR platform), computer vision solution with Atos

Poll:

Question: When do you plan to deploy computer vision analytics at scale?

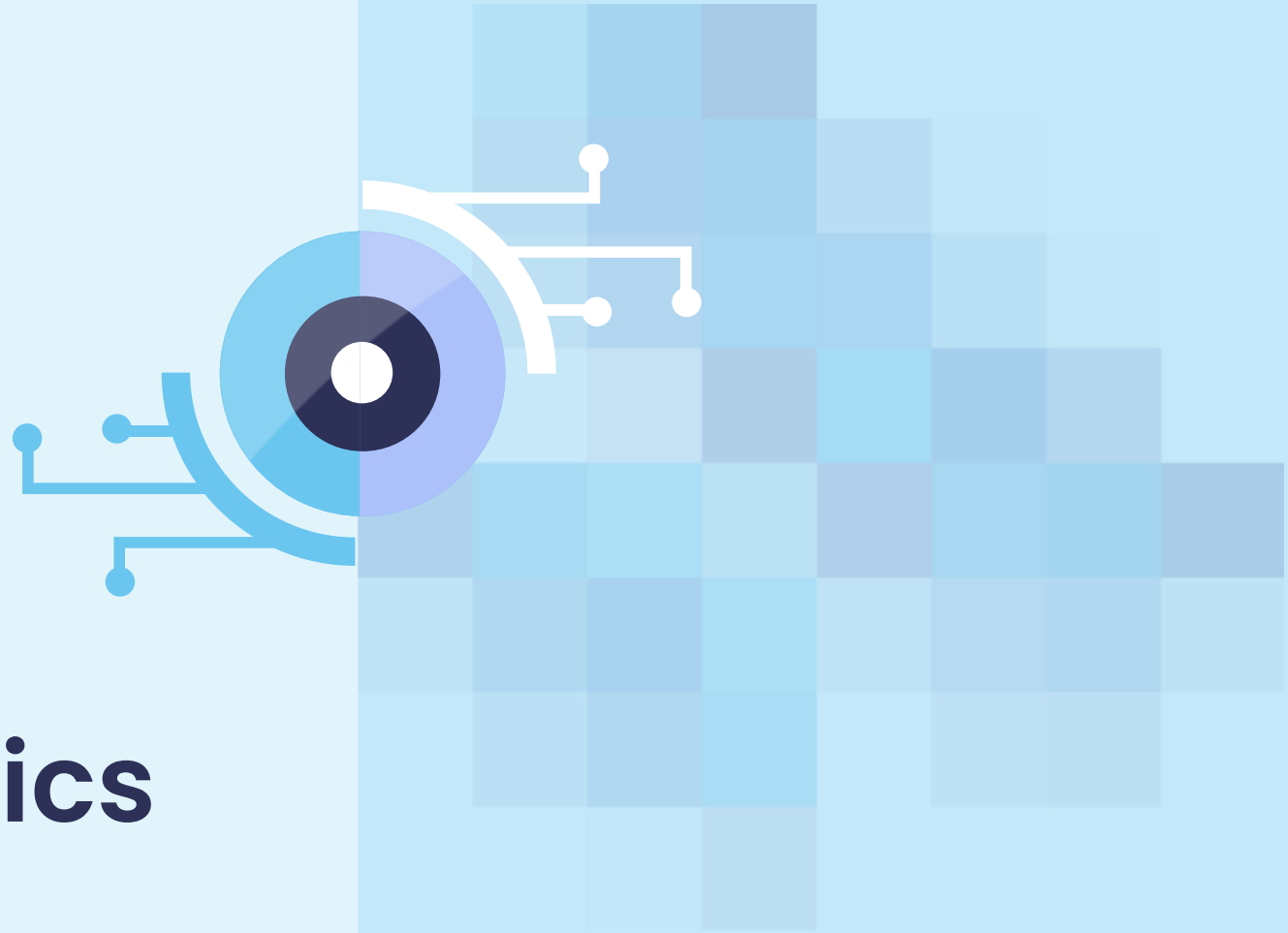
Options:

- Already deployed
- In 12 months
- In 24 months
- In 36 months
- No plans to deploy computer vision at scale

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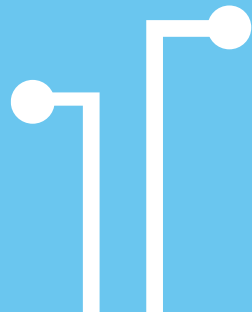
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AI Assisted Computer Vision Analytics at the Edge



AI on the Edge

Every industry that uses video or images on the edge to generate information assets is a **Computer Vision (CV) opportunity**



Computer Vision

A type of predictive AI

Uses algorithms to analyze images and videos

Make predictions about what is in the image or video

Main tasks

Object detection
(identify objects on the scene)

Image classification
(categorize e.g., is it a cat, dog, or human)

Scene understanding
(inferences e.g., intent, threat, quality)

Computer Vision on the Edge

Industries that use video or images on the edge to generate information assets



Security

Access control,
Unattended sites
surveillance



Healthcare

Telemedicine,
Medical imaging



Automotive

V2X,
Road safety



Manufacturing

Defect detection,
AMR, Safety



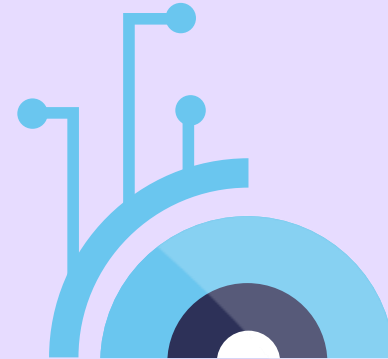
Retail

Smart shelf,
Customer experience



Quality CV

The quality of the CV inference depends on:



The quality of the video data

Environmental conditions

Resolution

Encoding

Network

The quality of the model and training

Quality of the collected data

Algorithm robustness

The quality of the AI Acceleration

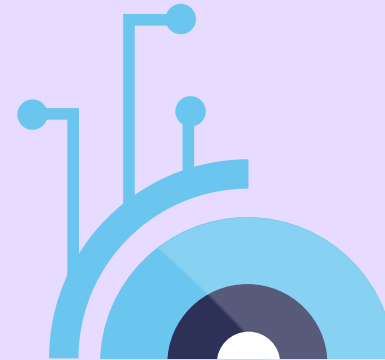
Time to inference

Integration

Power consumption

Quality CV

The quality of the CV inference depends on:



The quality of the video data

- Environmental conditions
- Resolution
- Encoding
- Network

The quality of the model and training

- Quality of the collected data
- Algorithm robustness

The quality of the AI Acceleration

- Time to inference
- Integration
- Power consumption

Video quality depends on the infrastructure



Bad video quality leads to

More compute resources

Increase in inference time

Increase in probability of false positive

Video quality depends on resolution and data integrity

Video resolution depends on the quality of the camera's sensor, and the available bit rate

Video data integrity depends on **normal** packet network behavior

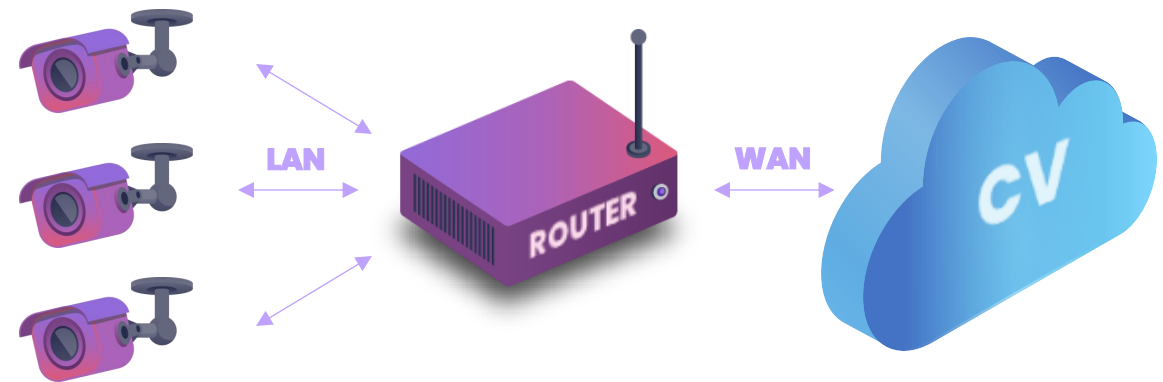
CV in the cloud

Pros

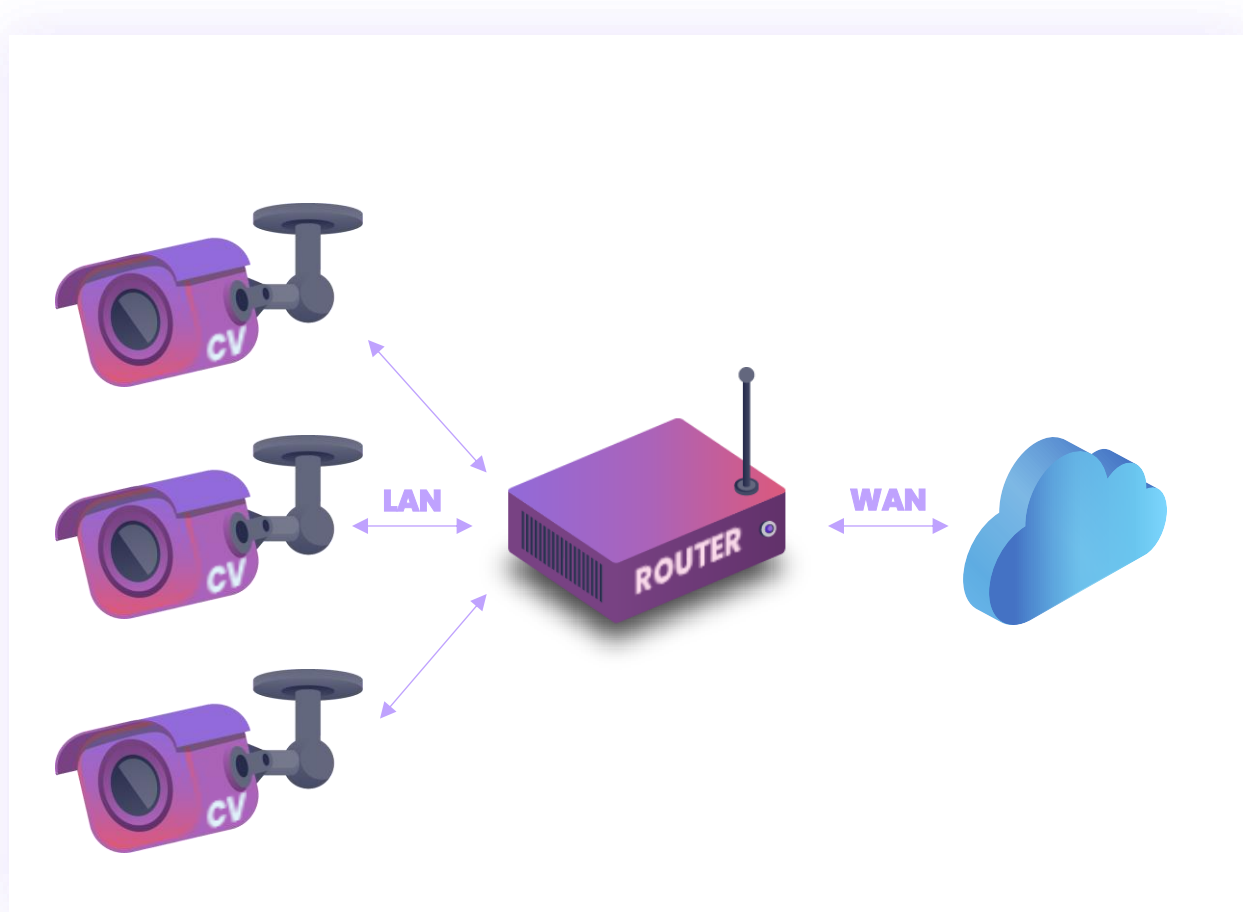
- Use of existing IP cameras
- Low-cost new IP cameras
- “Unlimited” processing power
- Cost of implementation

Cons

- Relatively high delay
- Cost & reliability of the access network
- Cloud availability
- Cost of operation (complexity of scale)



CV-enabled cameras on the Edge



Pros

- Highest video quality
- Lowest delay



Cons

- Cost of implementation
- Video or image only
- Cost of operation (complexity of scale)



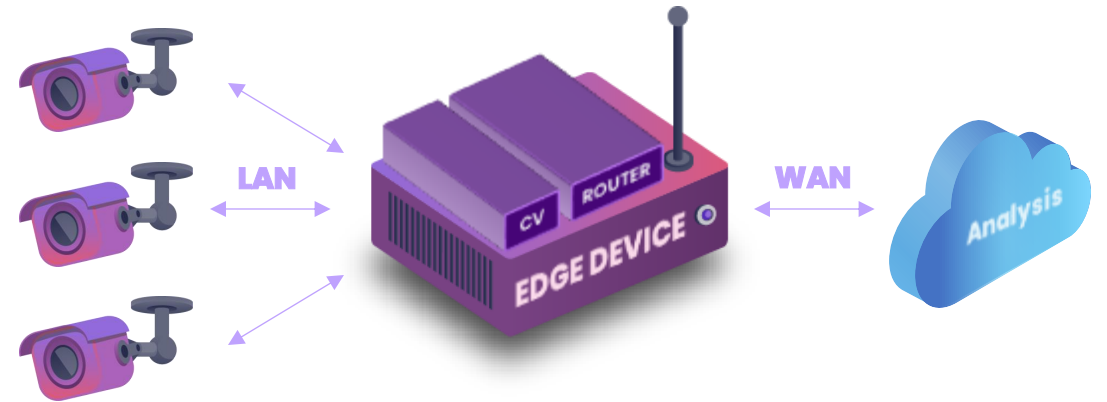
CV-enabled edge computing devices

Pros

- Use existing or low cost IP cameras
- Run multiple CV analytics software
- Use more sensors to increase reliability
- Simpler to manage and control
- Lowest delay

Cons

- Dependent on local network performance





A unified platform for edge computing that **simplifies** the planning, deployment, operation, and maintenance of network functions, business apps, and computing devices on the edge **@scale**



The power of **the platform** for edge computing

Edgility simplifies the complexity of scale at the edge



1000s of devices, each running a complex workload

- Any CV analytics software
- Any AI accelerator vendor
- Any network function
- Any business application

Streamline the IT mess

- Devices
- Operating system
- Networks
- Virtualization
- Applications
- Security

Increase operational efficiency

DAY 0

- Plan and design
- Build catalogs
- Workload design services
- Administer users and licenses

Day 1

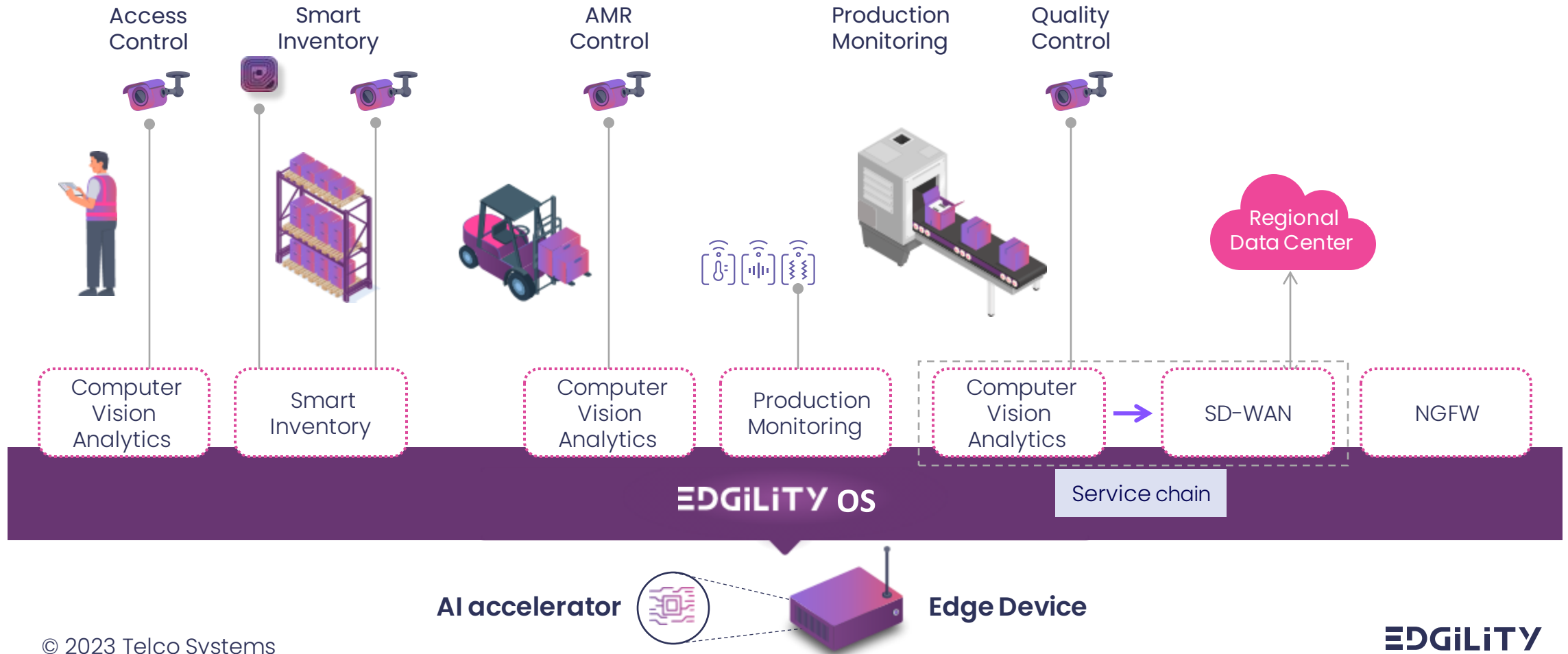
- Deploy
- Zero touch provisioning
- Monitoring

Day 2

- Day-to-day management and operation
- Changes and modifications
- Lifecycle management
- Updates
- Troubleshooting

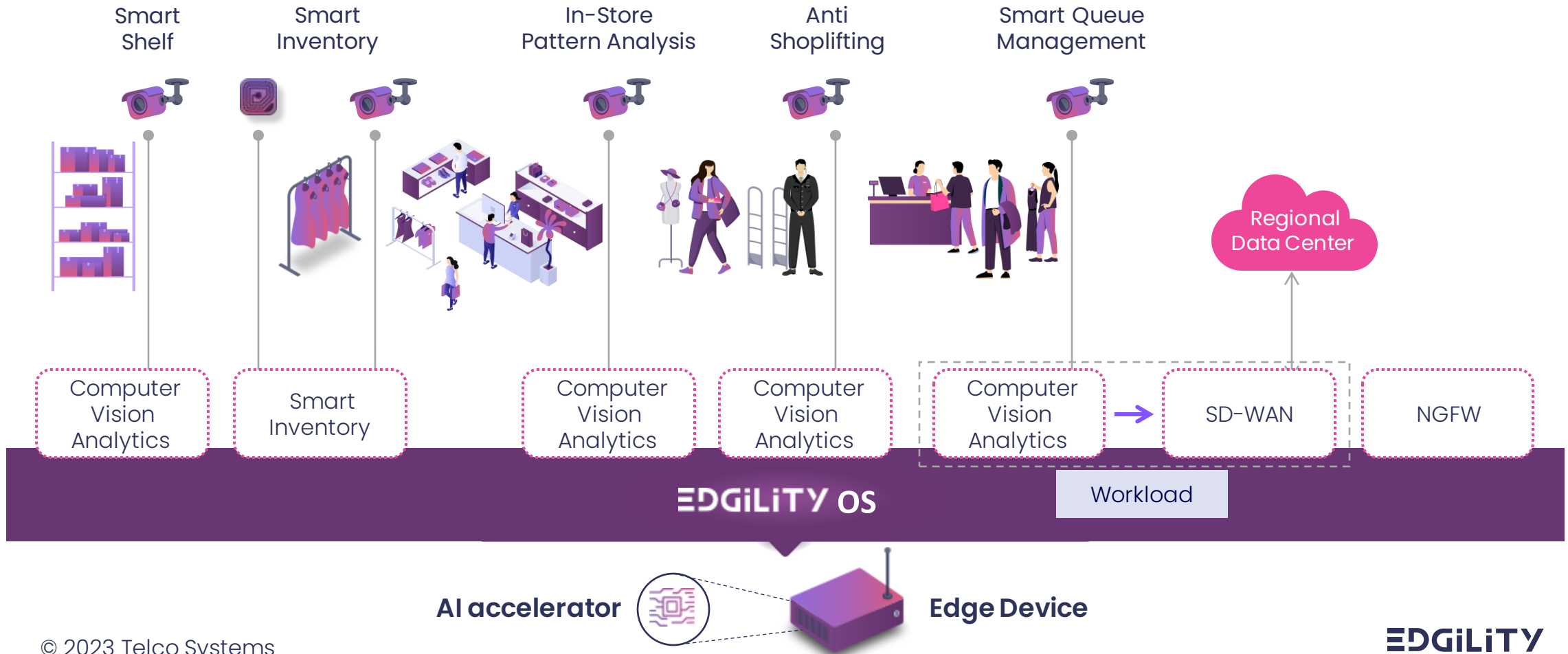
Computer Vision Use Cases in Manufacturing

1000s of sensors including cameras



Computer Vision Use Cases in Retail

A large retail store may use 1000s of cameras and sensors



EDGiLITY

by **TELCO SYSTEMS**



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