

Real time analytics at the edge for manufacturing

Solving critical production & safety challenges to drive unexpected growth

Manufacturers & AI



“

Most IoT data are not used currently [...] The data that are used today are mostly for anomaly detection and control, not optimization and prediction, which provide the greatest value.

”

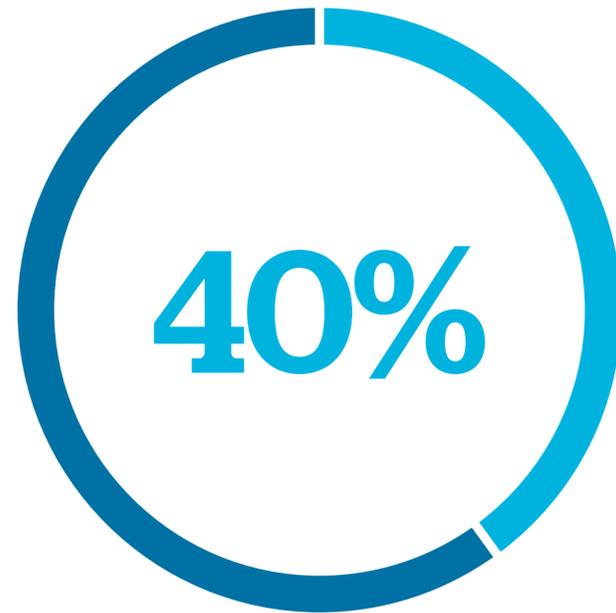
McKinsey

Combining human experience, insight, and AI techniques, manufacturers are discovering new ways to differentiate themselves while driving down costs, protecting employees and increasing margins.

Over the last 5 years, manufacturers drove massive data collection, major progress were made on the production line, however drivers of productivity (quality, time, automation, etc.) is still scarce.

95% of collected data is still waiting for appropriate treatment to generate valuable AI-originated insights. According to analysts, less than 30% of industrials actually have an AI development plan for their factory, despite over 85% of them believing they need to implement AI on their production processes.

3 Key figures in the manufacturing industry



By 2035, AI-powered technologies could increase labor productivity by up to 40% in manufacturing. (Accenture and Frontier Economics)



By 2022, 99% of video/image content captured for enterprise purposes will be analyzed by machines rather than humans. (Deloitte)



25% of CEOs of large companies consider artificial intelligence as a key technology

The 3 Computer vision use cases family in the manufacturing industry



Manufacturing Digital Security



Physical Security & Site Protection

- ✓ Perimeter Protection
- ✓ Fire / smoke detection
- ✓ Parking management
- ✓ Contactless Access control



Methods / shop floor management

- ✓ Isolated workers / fallings / strange behaviors
- ✓ Mask and security equipment control
- ✓ Restricted Area



Smart Factory



Industrialisation optimization

- ✓ Quality controls
- ✓ Inventory optimization

Quality control

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Challenges

Some flaws are too subtle & too small to be detected by the human eye. Indeed, the likelihood of production errors and quality problems typically increases when dealing with a product that has many different components all varying in size and function. Manufacturers are facing strict regulatory environment to ensure consumers safety & guarantee standards of quality. In cases of non-compliant products, it can lead to significant losses from dissatisfied customers to fines and class action lawsuits.



Objectives

- Increase First Pass Yield
- Decrease Rework, Scrap, Recall
- Reduce cost of control
- Improve On-Time Delivery



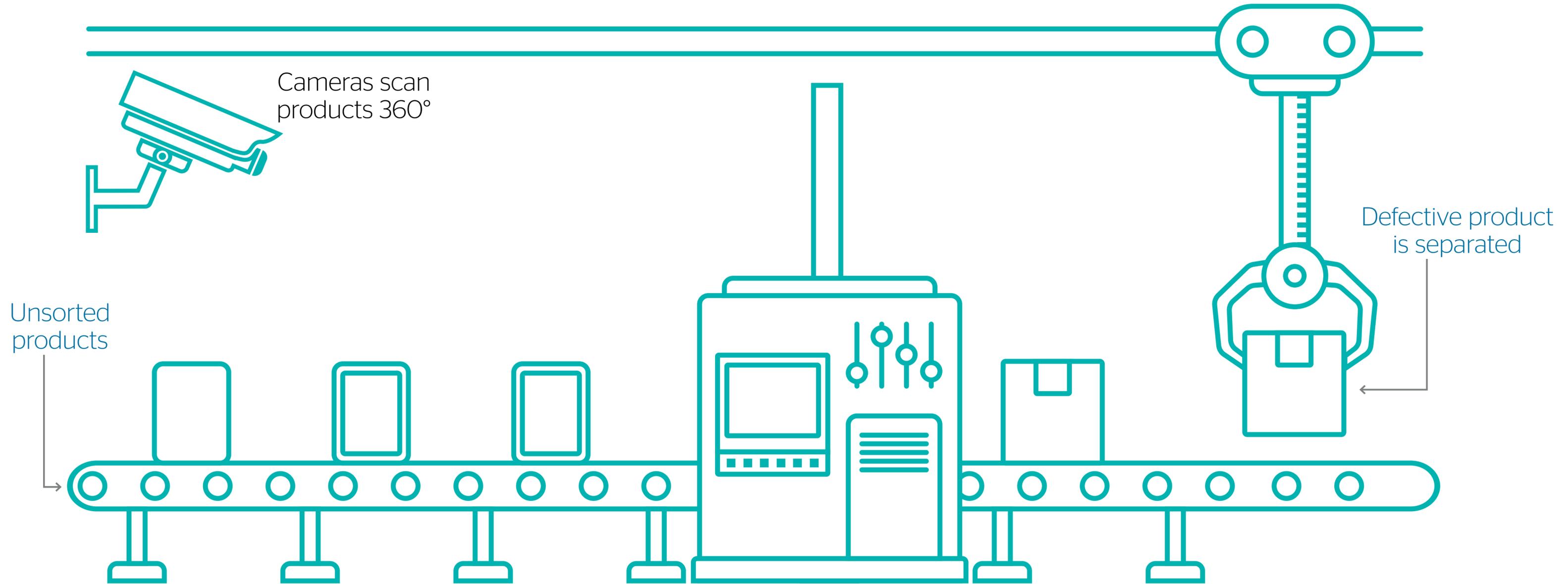
Solutions

On the production line, cameras scan the product in 360° simultaneously, then the edge computing server collects, processes data in real time. BullSequana Edge offering the highest inference capabilities outside the datacenter in the plant. This solution dramatically cuts the costs of real time in-line inspection are answers to these use cases:

- Machine vision inspection systems where defects get classified according to their type and are assigned an accompanying grade or default
- Package Inspection : count items before placing them into containers, check for broken or partially formed packages (right color, length, width, and whole) so defective containers are then rejected
- Object identification & classification
- Manufacturers can deal effectively with regulations around products spec and compliance

Quality control process optimized by BullSequana Edge

The sorting machine receives the information from BullSequana Edge. Thus, it sorts the non-faulty parts from the defective ones.



Data is sent in real time to BullSequana Edge. The server can be mounted on a wall and is optimized to perform on a production line.

Digital twin

Process Digital Twin for Pharma

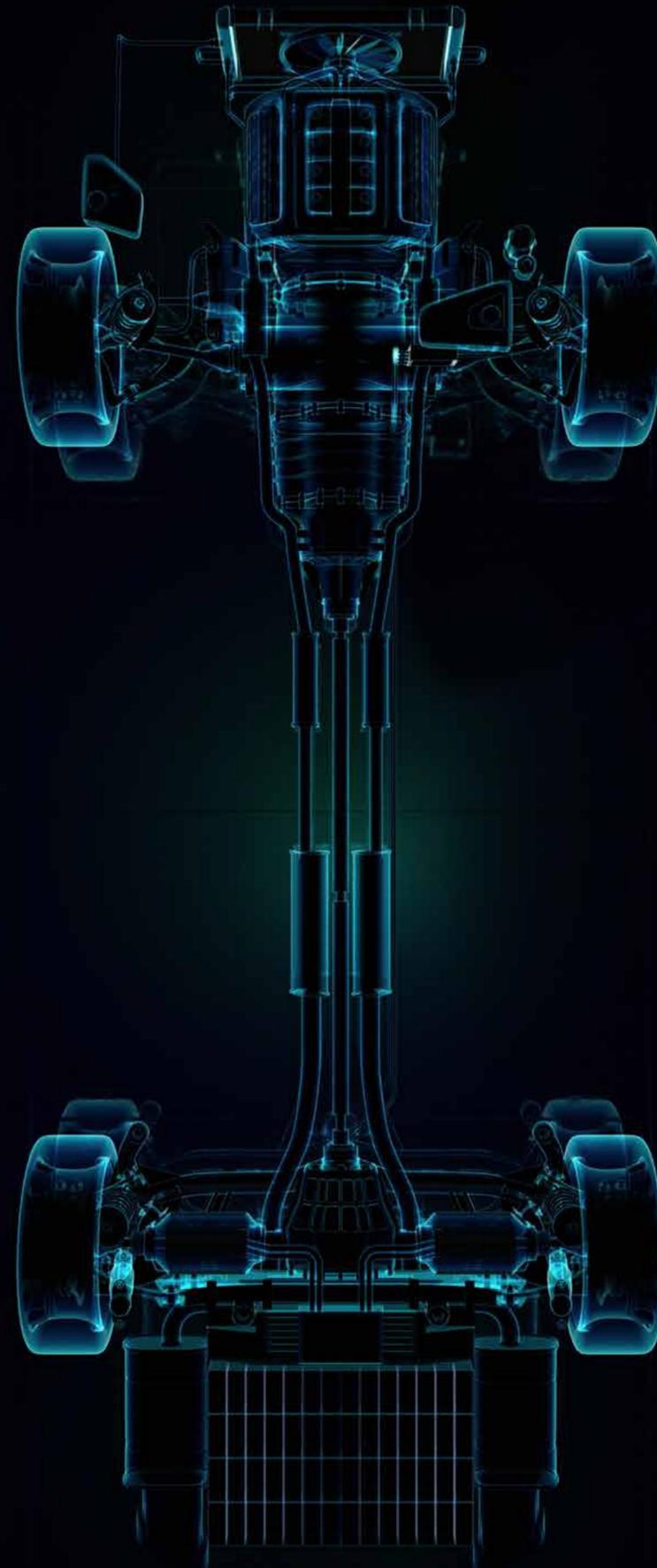
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Brochure

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The role of digital twins in producing a COVID-19 vaccine

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Challenges

- operational efficiency has plateaued
- operators lack full visibility and control
- occupants aren't satisfied with their space
- lack the ability to predict and preempt events.



Objectives

- Increased reliability of equipment and production lines
- Improved OEE through reduced downtime and improved performance
- Improved productivity
- Reduced risk in various areas, including product availability, marketplace reputation, and more
- Lower maintenance costs by predicting maintenance issues before breakdowns occur
- Faster production times



Solutions

- A digital twin is a virtual replica of a physical product, process, or system.
- A digital twin acts as a bridge between the digital and physical worlds, using connected sensors and IoT devices to collect real-time data about physical items. This data is then processed within a server at the edge (BullSequana Edge or BullSequana SA) and used to understand, analyze, manipulate, and optimize the item.

Digital twin



Use cases

- Using predictive maintenance to maintain equipment, production lines, and facilities
- Getting a better understanding of products by monitoring them in real-time as they are used by real customers or end-users
- Manufacturing process optimisation
- Enhancing product traceability processes
- Testing, validating, and refining assumptions
- Increasing the level of integration between unconnected systems
- Remote troubleshooting of equipment, regardless of geographical location

**The Impact of Digital
Twins on Infrastructure
Maintenance**

[click here](#)

**Digital twins drives
industrial decarbonization**

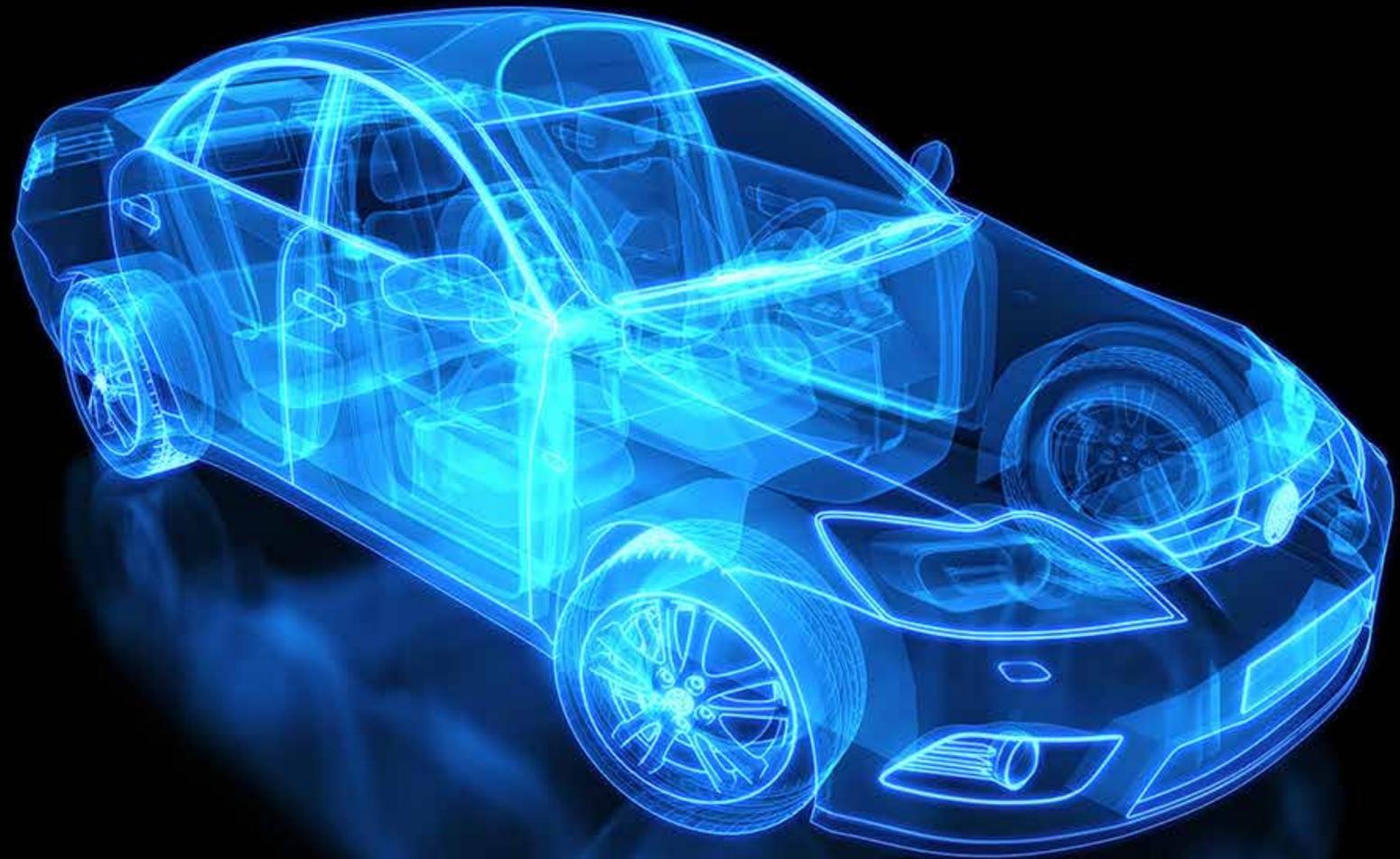
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BullSequana Edge

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BullSequana SA

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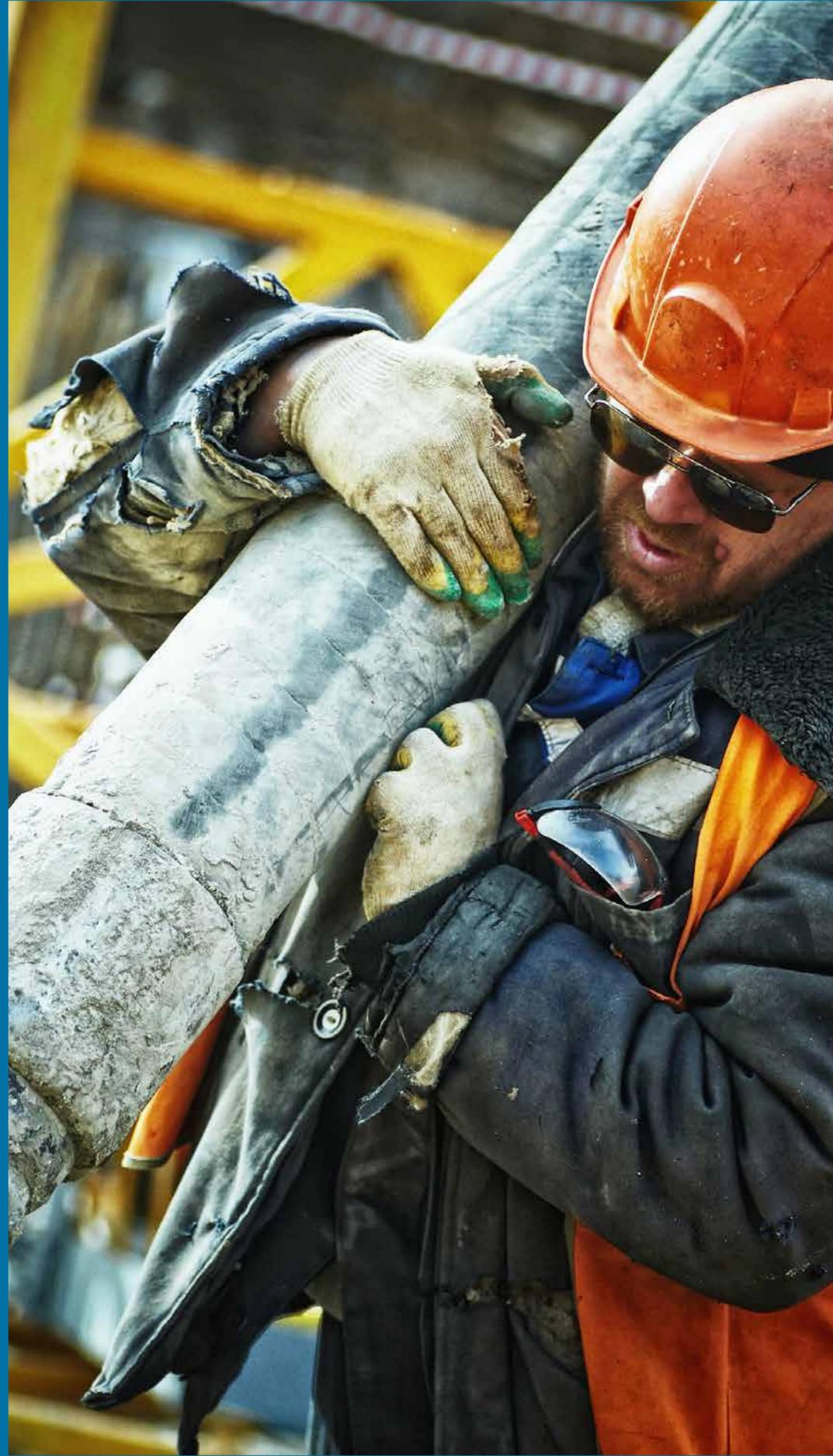


Worker safety

Process Digital Twin for Pharma
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The role of digital twins in
producing a COVID-19 vaccine
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Challenges

There are about 100 deaths per month on the job in 2019 in the USA, which has a direct impact on the company's reputation, attractiveness, but moreover on employee's safety feeling & productivity. It's a high priority for manufacturers to ensure safety at all stages. The key is to ensure compliance with safety standards to prevent workplace accidents.



Objectives

- Improve compliancy to safety standards
- Foster employees to respect security measures
- Decrease Monthly Health and Safety Prevention Costs

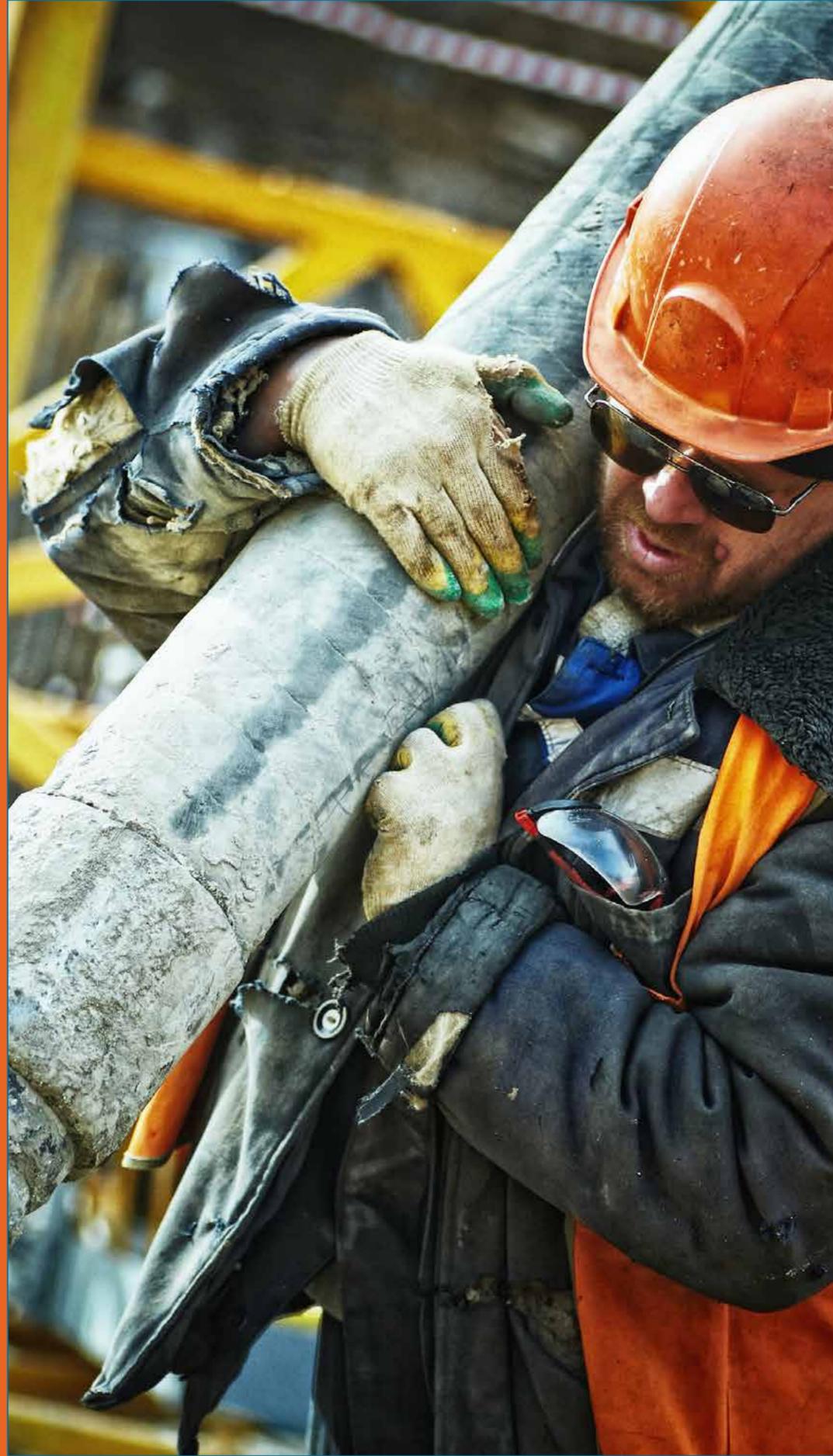


Solutions

A set of cameras is connected to BullSequana Edge servers, in case of a detection of a worker  not wearing his/her personal protective equipment (PPE) like ear plugs, helmet, gloves.. the server analyzes this information in real time and triggers an alert to production site managers. It can also detect:

- If workers are in a hazardous and life-threatening situation
- Environmental risks or hazards at the right time
- Real-time abnormal situation (People on the ground..)
- Dangerous driving situations with forklifts, trucks...

Inventory optimization



Challenges

- Time wasted on counting and finding supplies.
- Time wasted locating expired products.
- A lack of visibility into the supply and demand for production and thus there is a lack of predictability over the rate of supply utilization.
- Staff being underutilized while doing repetitive tasks that can be automated.



Objectives

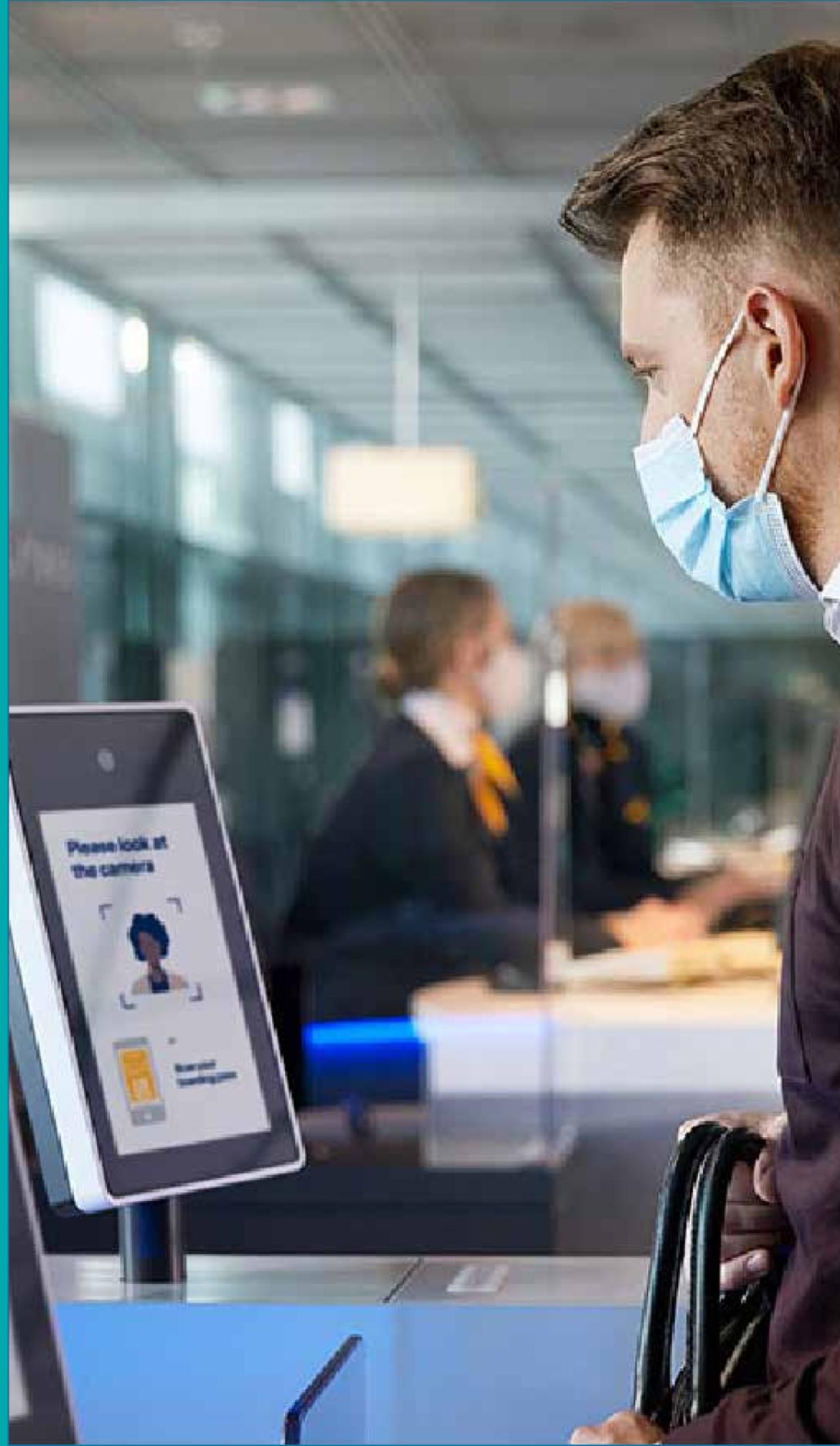
- No stock out or over stocks: adapt stock to sales previsions
- Increase productivity



Solutions

- Real time inventory thanks to automatic item identification
- Increase productivity of staff

Touchless Access Control & Infection Prevention



Challenges

- physical authentication methods can be lost, misused, or stolen
- Entry systems in which people need to touch surfaces



Objectives

- Decrease Monthly Health and Safety Prevention Costs
- Improve Productive Days %
- Improved visibility into tailgating attempts



Solutions

Touchless access control means access gates, office buildings, storerooms, etc) can be opened using facial recognition, and it's very simple to operationalize.

A user uploads images of the people who are granted access, an edge device or your existing CCTV are positioned at the point of entry, and the device or CCTV lets the right people in and keeps the wrong people out.

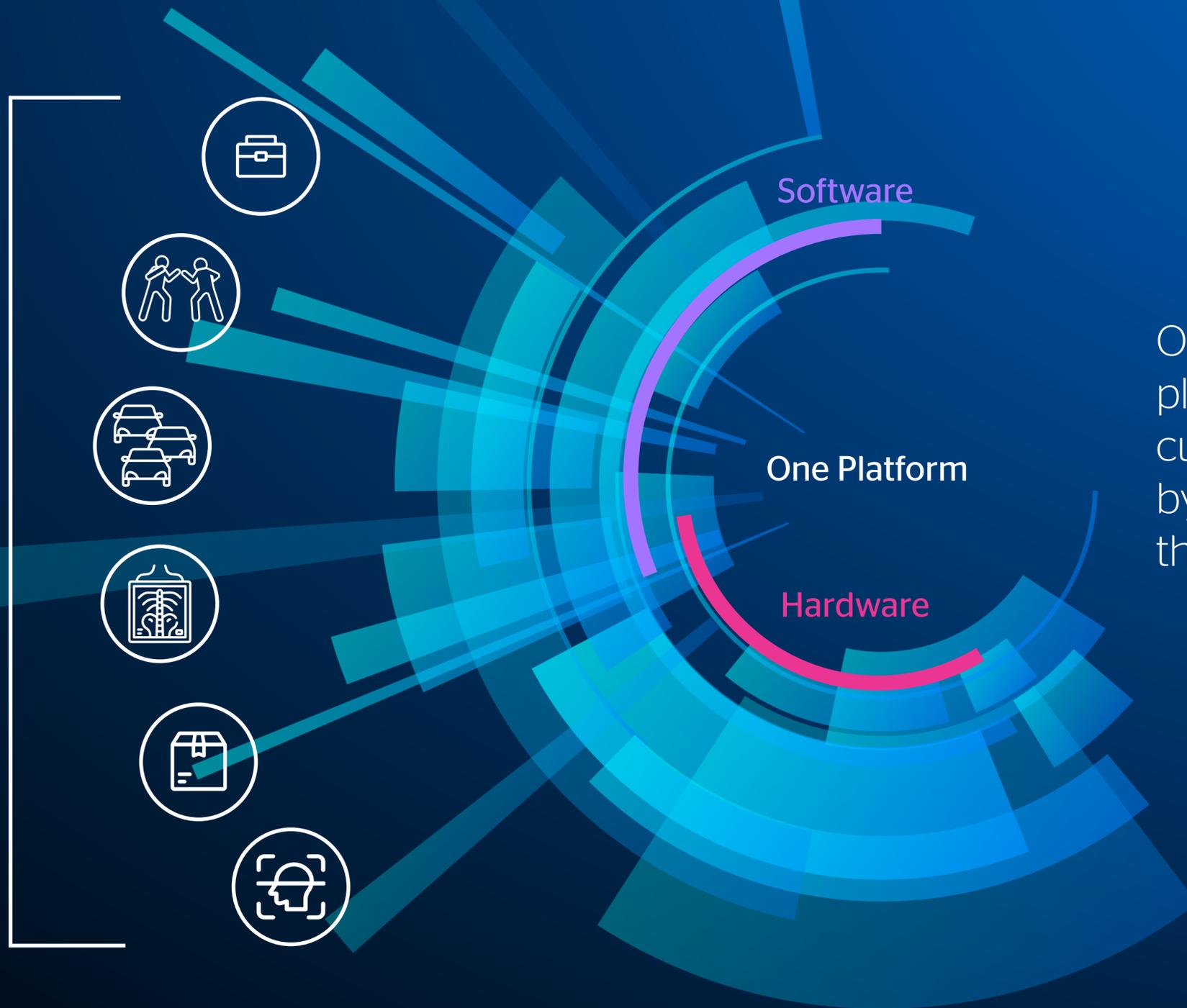
The system can be used alone or together with an RFID based solution.

Automatic door opening and closing at high infection risk areas (operating room) for authorized personnel (doctors, nurses) after disinfection.

Computer Vision Platform

The highly scalable end-to-end computer vision platform

Pre-trained
& customizable
AI models



One hardware & software platform providing pre-trained & customizable AI models enriched by Atos computer vision experts through a worldwide labs.

VISuite



VISuite empowers automation in CCTV applications through premium high end video analytics for live response and forensic investigations. It has been successfully deployed in mission critical solutions globally, across multiple verticals. VISuite is at the forefront of the Artificial Intelligence revolution backed by strong global patents.

[Learn more >](#)



Full range of edge computing servers from edge datacenter/cloud to far edge

Atos Computer Vision Platform is based on compute intensive servers allowing cloud to edge computer vision models to process data in real time anywhere, whatever business constraints

BullSequana Edge nano



Plug & play analytics in a compact & ruggedized server

[Learn more](#)

BullSequana Edge



AI inference and training outside the datacenter

[Learn more](#)

BullSequana SA20G



AI inference & training inside the datacenter

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BullSequana X451



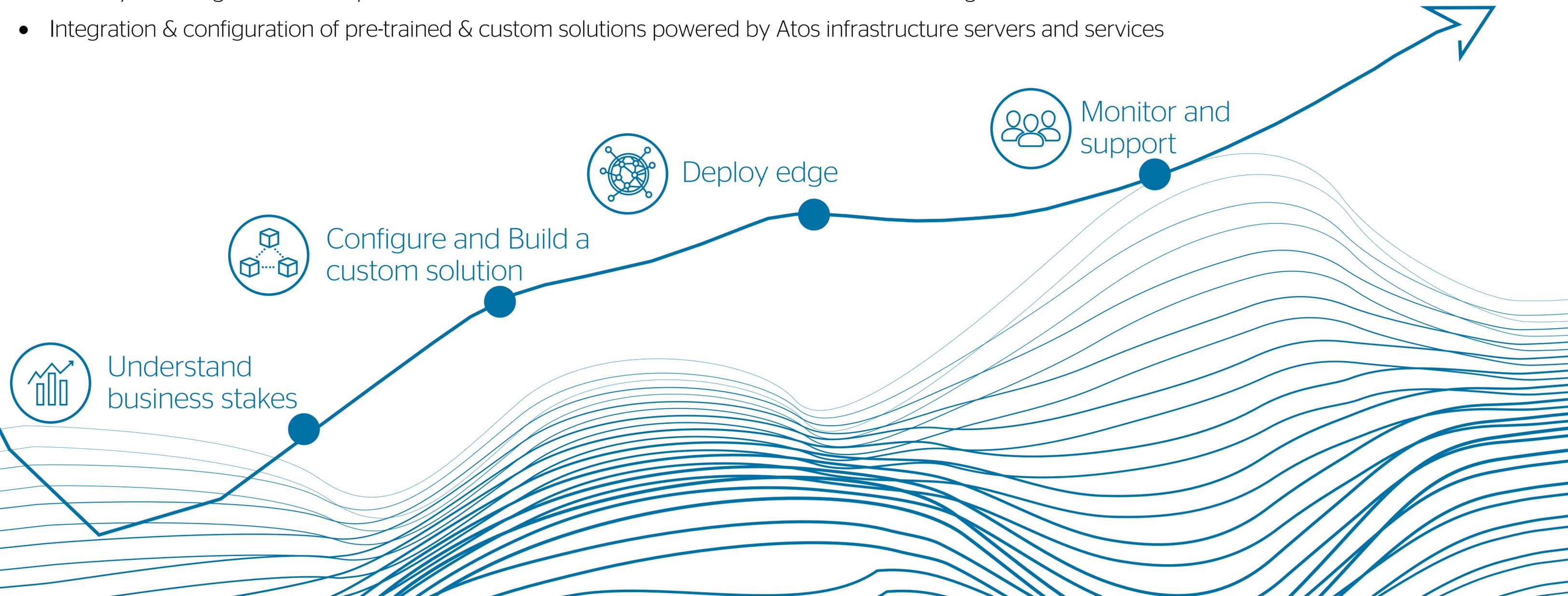
High performance computer vision computing for training

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Atos delivers an end-to-end computer vision approach

We take into account your existing infrastructure and your priorities, to go from idea to realization. The Atos approach combines business and technology expertise and accelerates the passage from idea to implementation.

- Delivering custom service with our worldwide expert labs
- Delivery & managed service to provide the best model to the customer APEX/OPEX Consulting
- Integration & configuration of pre-trained & custom solutions powered by Atos infrastructure servers and services





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