acuvate®
… where *Acumen drives Innovation*

How Acuvate is helping Manufacturing Industry to get the maximum out of DIGITAL

(Johan Krebbers & Poonam Chug)

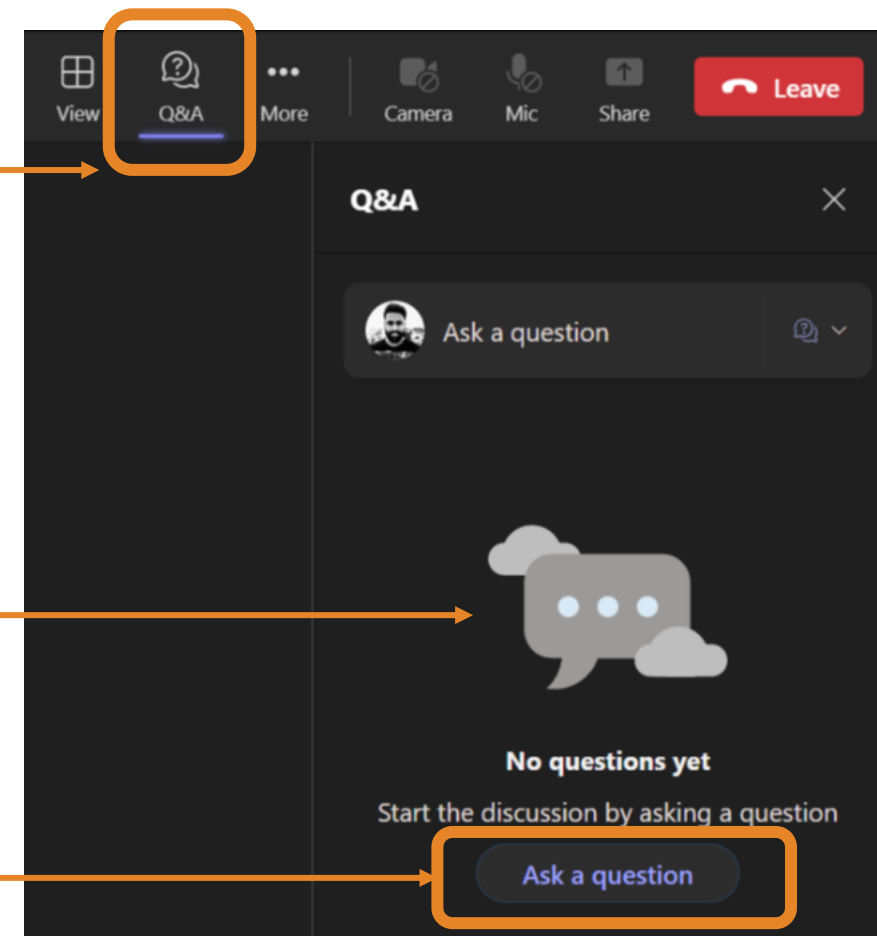# **Housekeeping –** Asking speaker a question

We want to hear from you!
Please submit your questions. We'll reserve time for Q&A at the end of the webinar.

1 To submit questions, click on the Q&A at the top right corner

2 Clicking on the Q&A icon will open a window where you can type your question.

3 Click on the 'Ask a question' button & type your question.

Agenda

- About Acuvate

- Acuvate's famous (7 steps) Standard Digital Framework

- Acuvate's Data Platform for the Manufacturing Industry

- Examples: Business Challenges in Manufacturing

- Digital Solutions for Manufacturing with Data & AI

- What next? Where to go when you need / more information.

About Acuvate

Acuvate is a global player in next-generation digital solutions & services that modernize, automate and transform enterprise applications. With over **17 years** of experience, we have been enabling our clients globally to steer their digital transformation strategy using **AI, Data & Cloud**.

We build & develop smart & sustainable solutions to help our customers transform their conventional processes to match the next-generation technological trend.

OUR FOCUS

EMERGING TECH

ACCELERATORS
- Org Brain
- Mesh 3.0 By Acuvate
- BotCore By Acuvate
- MPASS By Acuvate
- Optimum

CONSULTING SERVICES
- Weave. FABRIC WORKSHOP
- Ignite GEN AI WORKSHOP

Accelerating our Customer's transformation journey through AI
- AI & Automation
- Modernization
- Data & Analytics
- Managed Services
- Workplace Modernization
- Migration

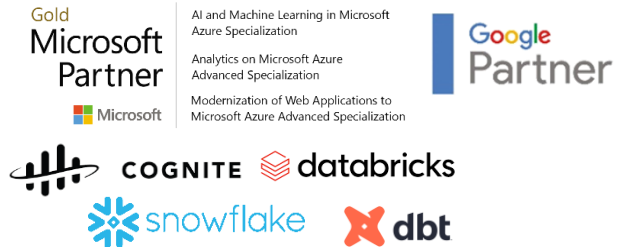**500+**
Multi-Skilled Professionals

17+
Years in the Industry

3 Continents, 7 offices
North America, Europe, Asia

Gold Microsoft Partner
- AI and Machine Learning in Microsoft Azure Specialization
- Analytics on Microsoft Azure Advanced Specialization
- Modernization of Web Applications to Microsoft Azure Advanced Specialization

Google Partner

COGNITE · databricks · snowflake · dbt

UiPath · AUTOMATION ANYWHERE · blueprint

Trusted partner of Several Fortune 500 companies across the globe

Certification & Compliances
ISO 27001 Certified · GDPR The General Data Protection Regulation · ITIL

OUR GLOBAL CLIENTELE

CPG, Retail & Supply Chain
Unilever · HP · DELL · adidas · AB InBev · DIAGEO · Mars · SUNTORY · Reckitt · connexi · Kimberly-Clark · BRITANNIA Eat Healthy, Think Better · TATA GLOBAL BEVERAGES · Domino's Pizza

Oil & Gas, Energy
Shell · NEPTUNE ENERGY · sherritt · Seadrill · SUPERGAS

Manufacturing
niagara · EVONIK · GREIF · HEIDELBERGCEMENT · AkzoNobel · HARSCO INFRASTRUCTURE · BUILT/

Government
NYC Environmental Protection · NYC School Construction Authority SCA · U HEALTH UNIVERSITY OF UTAH · NEW ZEALAND FOREIGN AFFAIRS & TRADE · WEST MIDLANDS FIRE SERVICE · BC PENSION CORPORATION

BFSI
BAJAJ FINSERV · desert FINANCIAL CREDIT UNION · ADIB · ARAG · Emirates NBD · orient insurance pjsc · AON · AXA · AA

Healthcare and Pharma
Hanger Empowering Human Potential · CBI HEALTH GROUP · Biogen · Celgene · medline Inspired Solutions for your laboratory · astellas

Technology, Telecommunications & Others
DATAMARK · Foresight Ever-growing value. Everlasting value. · KIER · City · Crowe · Biffa · W · NEWPARK · XILINX ALL PROGRAMMABLE · Bentley · Wincanton · RSI

TRUSTED BY

200+

ENTERPRISES WORLDWIDE INCLUDING SEVERAL

FORTUNE 500

Org Brain for **Manufacturing**

Acuvate's framework, constructed using Azure Open AI, aims to facilitate Manufacturing enterprises in expediting their AI advancements.

acuvate®
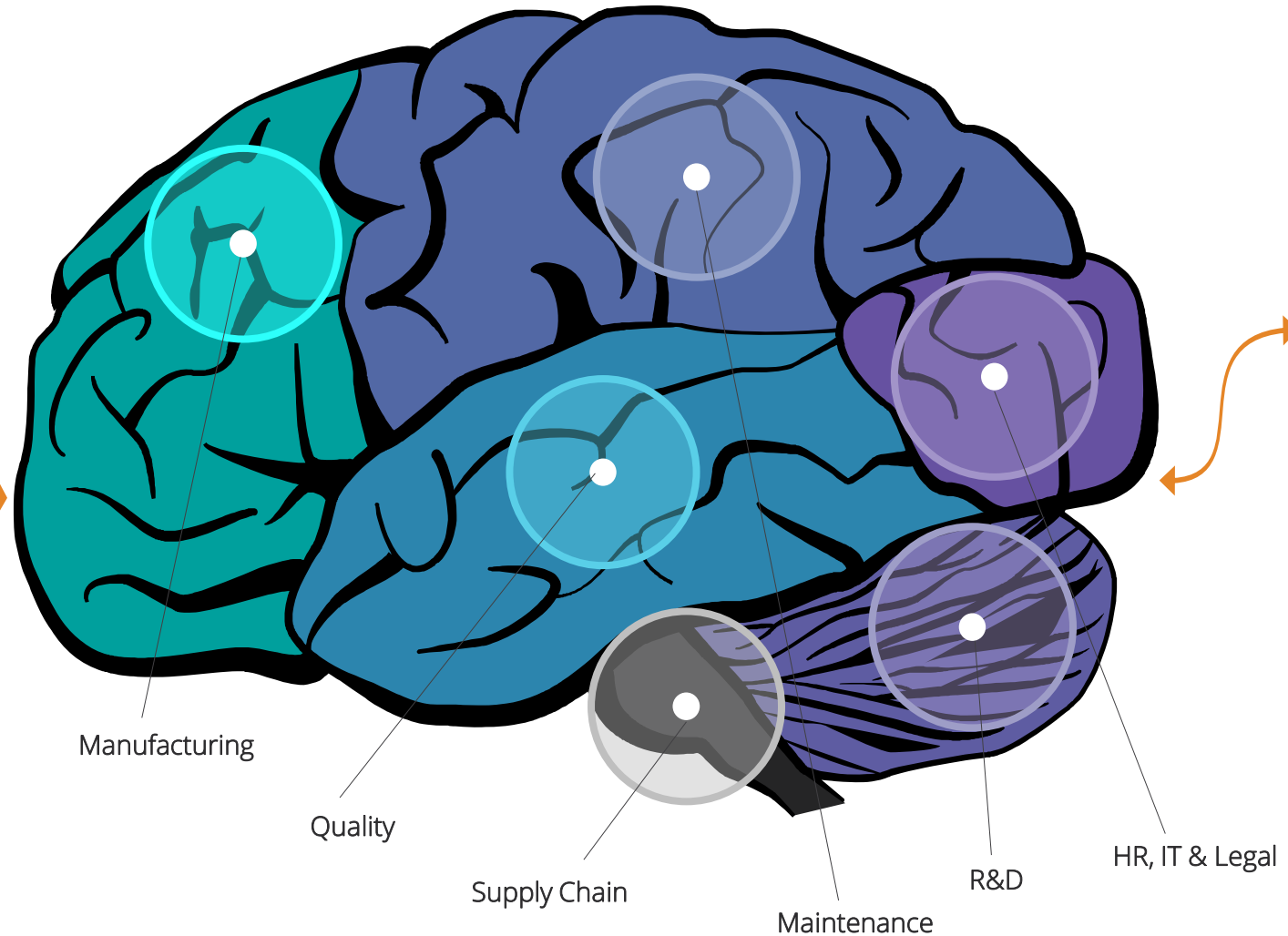... where *Acumen* drives *Innovation*

Data Sources

External

- Social Media
- Open Source
- Vendors/ Suppliers
- Retailers / eComm
- 3rd Party (Nielsen, etc)

Internal

- Structured (ERP, LoB, MES, SCADA)
- Unstructured (KMS)
- Sensor Data (Time Series)
- Database/ Data Warehouse

Manufacturing

Quality

Supply Chain

Maintenance

R&D

HR, IT & Legal

User Personas

Employee
- Can you get me Payslip for last month?
- How do I reset my SAP password?
- Create the JD for a marketing executive role.

Maintenance
- Need troubleshooting guidance to fix this leakage.
- Can you show me when this leakage had occurred in the past and how was it resolved?

Factory Workers
- Which of my assets had downtime last week?
- HSSE information

Factory Supervisors
- Calculate the average Asset Utilization for each month and region.
- What is the average OEE for UAE

Quality
- What is the procedure to perform cleaning in place?
- What is the PPE I should use for inspections in the HVAC area?

Participating in Polls

Your opinion is valuable to us!
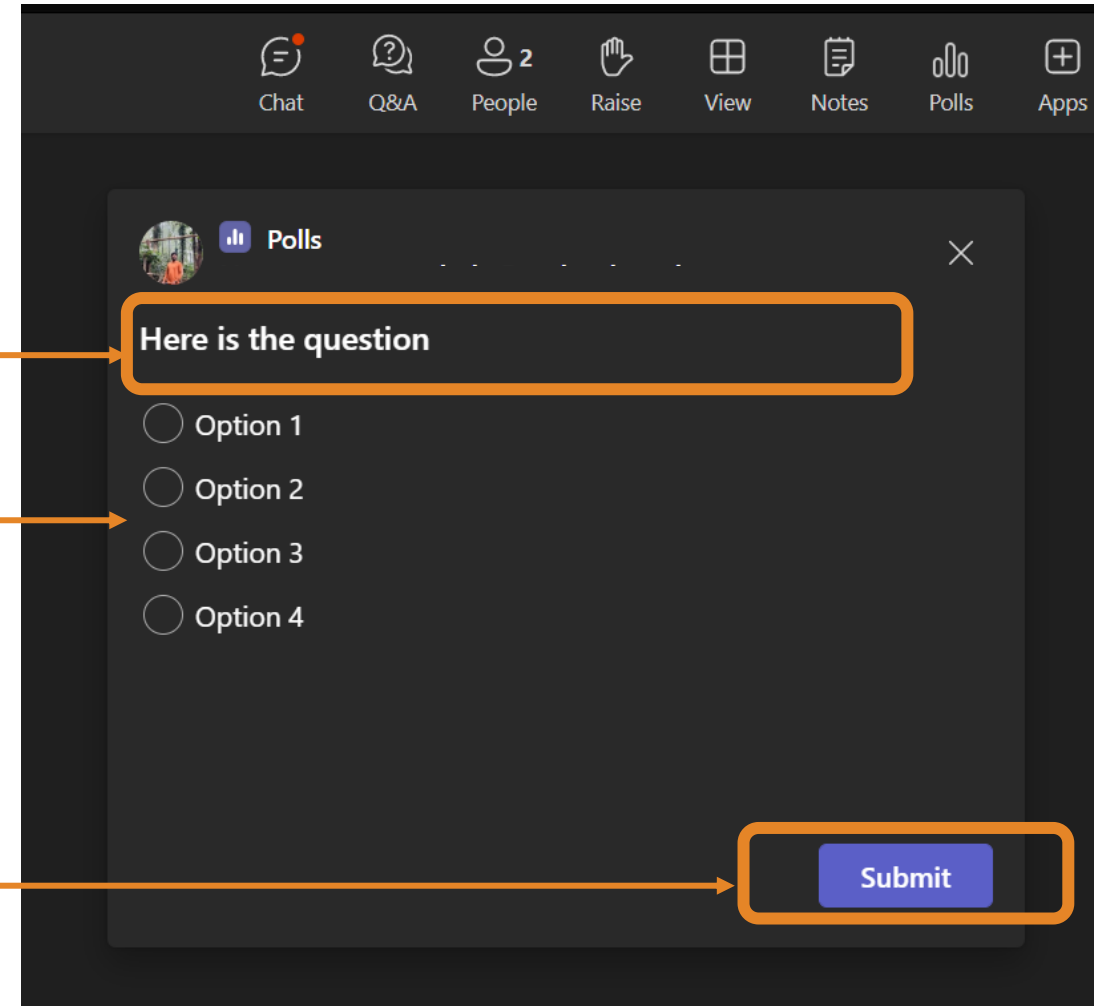Please take part in our polls to help us understand your views.

1 Submit Your Vote:

A new window will pop up with the poll question.

Choose your answer from the provided options

2 Confirm Your Selection:

After selecting your option, make sure to hit the 'Submit' button to record your response..

Chat   Q&A   People   Raise   View   Notes   Polls   Apps

Polls

Here is the question

◯ Option 1
◯ Option 2
◯ Option 3
◯ Option 4

Submit

Get in touch with us at advisors@acuvate.com or follow us on LinkedIn @Acuvate

Poll 1

Which of these emerging technologies do you believe holds the most promise for transforming the Manufacturing industry?

Walk us through
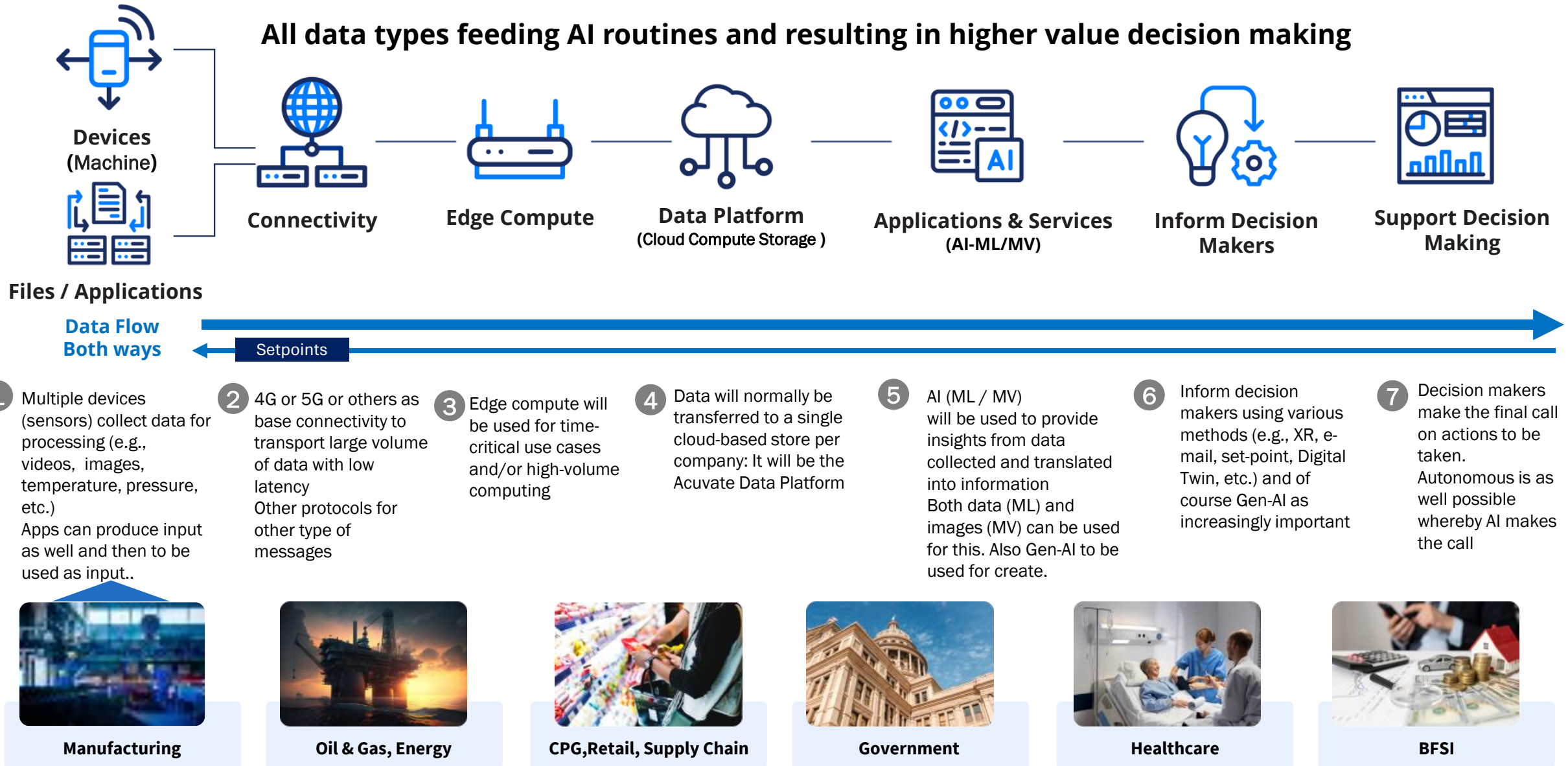
Acuvate's End to End

Data Services

Acuvate's End to End Data Services

- **DIGITAL** driven**.**

- **End to End**: From collecting the right data as input to getting maximum **Business value** out of each process.

- **Need for increased Speed** and Efficiency drives Demand for **Realtime** execution of business workflows.

- Our prime focus initially at **MANUFACTURING & ENERGY**, but growing towards other Industries.

- **Scalability** important given the expected **explosive growth of data**.

- Being able to exploit latest **AI (ML / MV / GEN**) developments.

- OT and IT support.

- Getting ready for **Digital Twins**.

Acuvate's Standard Digital Framework

Acuvate's framework, to Modernize, Optimize and Transform businesses to Digital Decision Automation
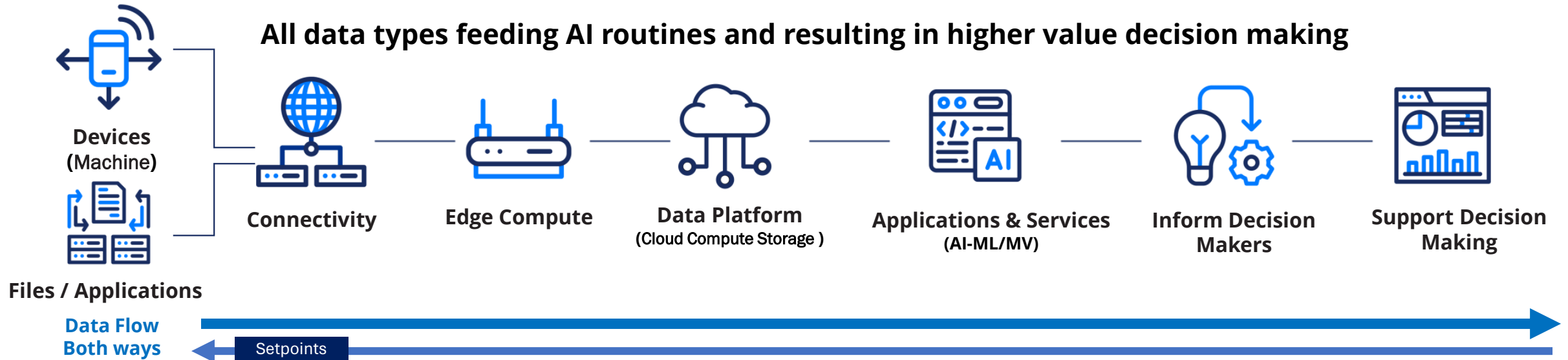
acuvate™
…where Acumen drives Innovation

All data types feeding AI routines and resulting in higher value decision making

Devices (Machine)

Files / Applications

Connectivity — **Edge Compute** — **Data Platform** (Cloud Compute Storage) — **Applications & Services** (AI-ML/MV) — **Inform Decision Makers** — **Support Decision Making**

Data Flow Both ways

Setpoints

1 Multiple devices (sensors) collect data for processing (e.g., videos, images, temperature, pressure, etc.) Apps can produce input as well and then to be used as input..

2 4G or 5G or others as base connectivity to transport large volume of data with low latency Other protocols for other type of messages

3 Edge compute will be used for time-critical use cases and/or high-volume computing

4 Data will normally be transferred to a single cloud-based store per company: It will be the Acuvate Data Platform

5 AI (ML / MV) will be used to provide insights from data collected and translated into information Both data (ML) and images (MV) can be used for this. Also Gen-AI to be used for create.

6 Inform decision makers using various methods (e.g., XR, e-mail, set-point, Digital Twin, etc.) and of course Gen-AI as increasingly important

7 Decision makers make the final call on actions to be taken. Autonomous is as well possible whereby AI makes the call

Manufacturing | **Oil & Gas, Energy** | **CPG,Retail, Supply Chain** | **Government** | **Healthcare** | **BFSI**

APPLIES TO ANY INDUSTRY / GOV / ETC. BUSINESS

How do you envision the **Manufacturing sector** benefitting of this **Acuvate's Digital Framework?**

Applying Acuvate's Digital Framework for Manufacturing

Acuvate's framework, to Modernize, Optimize and Transform businesses to Digital Decision Automation

acuvate™
... where Acumen drives Innovation

All data types feeding AI routines and resulting in higher value decision making

Devices (Machine)

Files / Applications

Connectivity — **Edge Compute** — **Data Platform** (Cloud Compute Storage) — **Applications & Services** (AI-ML/MV) — **Inform Decision Makers** — **Support Decision Making**

Data Flow Both ways

Setpoints

1. For Manufacturing good support for Timeseries data (step 1) is important; Using GEN-AI to read / report / analyze your Timeseries data; Input for AI-ML for, for example, Predictive Maintenance (engines, etc.) robots and drones replacing staff in case of Warehouse Management; (AGVs) Unmanned vehicles; Special goods delivery; etc.

2. Think about 5G for your realtime Quality Assurance since 5G allows for high data throughput such as images and low latency to support the realtime aspects.

3. With Edge real-time support such as for Quality Assurance. And that means that AI-MV will be executed here but Model development and training on Acuvate Data Platform. Same can be done for other time critical activities such as warehouse management.

4. Acuvate Data Platform will function as your your Company Data Platform with all data (any datatype). is important for your AI activities (step 5). To train all model and to run models.

5. Acuvate Data Platform with all data (any datatype). is important for your AI (ML / MV) activities. ML for Predictive Maintenance and MV (or increasingly Gen-AI) Warehouse Management (non time critical)

6. Start thinking about Digital Twin (step 6) (Operations / Maintenance / Engineering) in step-by-step approach for managing your Production line.: However, access to all data is important. Den AI is important here as well.

7. Expanding realtime decision making since more and more relevant.
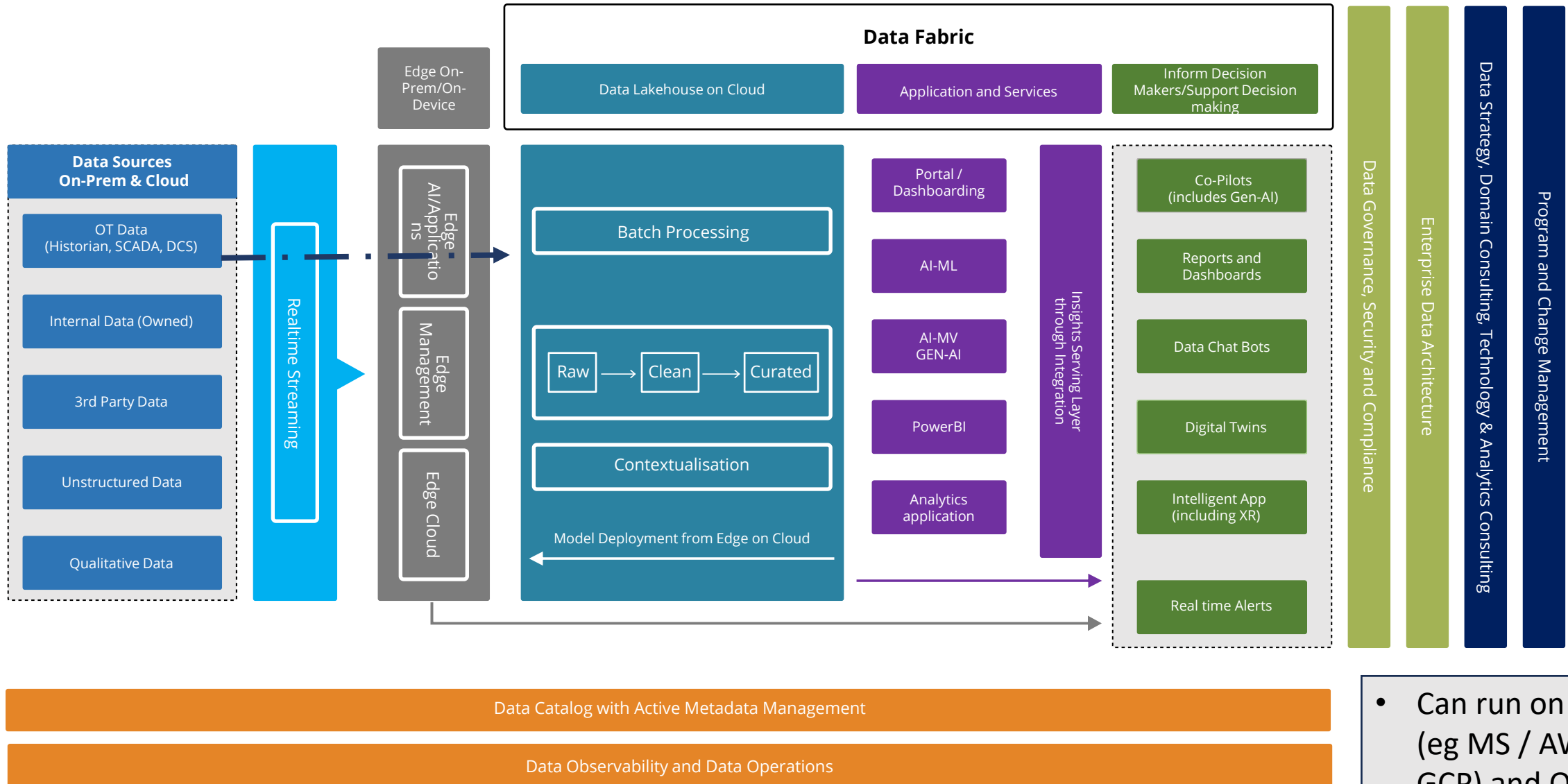
Manufacturing

What is

Acuvate's Industrial

Data Platform?

Acuvate's Industrial Data Platform

- **Scalable to support ever increasing data volumes.**

- **This version is focused at Manufacturing and Related File input data.**

- **For this reason, there is direct support for your important filetypes such as Timeseries, Images, etc.**

- **Several features to manipulate your important data types.**

- **Full support for AI (MV-ML- GEN) modelling and related data support.**

- **Link to EDGE version so data can be stored on edge and/or main data platform**

- **Fully imbedded in the Acuvate 7 steps approach (see slide 11).**

Acuvate's Industrial Intelligence Data Platform - Master

Data Fabric

Data Lakehouse on Cloud | Application and Services | Inform Decision Makers/Support Decision making

Edge On-Prem/On-Device

Data Sources On-Prem & Cloud
- OT Data (Historian, SCADA, DCS)
- Internal Data (Owned)
- 3rd Party Data
- Unstructured Data
- Qualitative Data

Realtime Streaming

Edge AI/Applications
Edge Management
Edge Cloud

Batch Processing

Raw → Clean → Curated

Contextualisation

Model Deployment from Edge on Cloud

Portal / Dashboarding
AI-ML
AI-MV GEN-AI
PowerBI
Analytics application

Insights Serving Layer through Integration

- Co-Pilots (includes Gen-AI)
- Reports and Dashboards
- Data Chat Bots
- Digital Twins
- Intelligent App (including XR)
- Real time Alerts

Data Governance, Security and Compliance
Enterprise Data Architecture
Data Strategy, Domain Consulting, Technology & Analytics Consulting
Program and Change Management

Data Catalog with Active Metadata Management

Data Observability and Data Operations

- Can run on Cloud (eg MS / AWS / GCP) and On Premise

Acuvate's Industrial Intelligence Data Platform – Manufacturing Example

Data Fabric

Data Lakehouse on Cloud	Application and Services	Inform Decision Makers/Support Decision making

Data Sources On-Prem & Cloud

- IT / OT Timeseries data
- SAP asset maintenance records
- IT event data
- Camera (robot) images
- HR records

Realtime Streaming

Edge On-Prem/On-Device

Edge AI/Applications

Edge Management

Edge Cloud

All data sources (Timeseries, IT events, Cameras images, HR data) Loaded in this Acuvate Data Platform

Raw → Clean → Curated

Contextualisation

Model Deployment from Edge on Cloud

- Portal / Dashboarding
- AI-ML
- AI-MV GEN-AI
- PowerBI
- Analytics application

Insights Serving Layer through Integration

- Co-Pilots (**includes** Gen-AI)
- **Reports and Dashboards**
- **Data Chat Bots**
- **Digital Twins**
- Intelligent App (including XR)
- Real time Alerts

Data Governance, Security and Compliance

Enterprise Data Architecture

Data Strategy, Domain Consulting, Technology & Analytics Consulting

Program and Change Management

Data Catalog with Active Metadata Management

Data Observability and Data Operations

Poll 2

*In your organization, what is the **biggest challenge in adopting digital transformation** strategies within the Manufacturing sector?*

How **Acuvate's Digital Framework** can help solve common **business** challenges in the Manufacturing Sector?

AI-MV such as: Quality Control
More AI-MV examples

AI-ML such as:
Unplanned downtime
impacting production

HSSE
improvements
for Factories

**Manufacturing
What we can
help with**

**IT/OT Integration/
Realtime/ Sensors/
Edge**

Energy Consumption
and Benchmarking

Warehouse
Management

IT and OT

IT (Information Technology)

IT is standards based such as WIFI; 4G/5G; Intel; MS Windows, LPWAN (Low Power Wide Area Network), etc.

There is a trend making the reporting Data colllection part of the IT set up since it does not need the more stringent OT availability requirements; The latter are meant for all processes driving process automation and therefore running the actual facilities.

OT (Operational Technology)

And relates to all activities used for running critical processes underpinning the plant: For example the Process Control Domain (PCD) for Manufacturing companies driving their process automation.

OT is still mainly proprietary based, whereby mixing and matching of equipment of different suppliers often is not allowed ie PCD based on Siemens or Honeywell or Yokogawa, etc. equipment. This means less flexibility and higher cost.

Given the criticality OT service levels are more stringent.

IT and OT → OT (Manufacturing) future developments

Some years ago a trend has started to make OT also standards based" *One example: The O-PAS™ Standard is a "standard of standards" developed by the Open Process Automation™ Forum (OPAF). The standard defines an open, interoperable, and secure architecture for industrial process automation systems.*
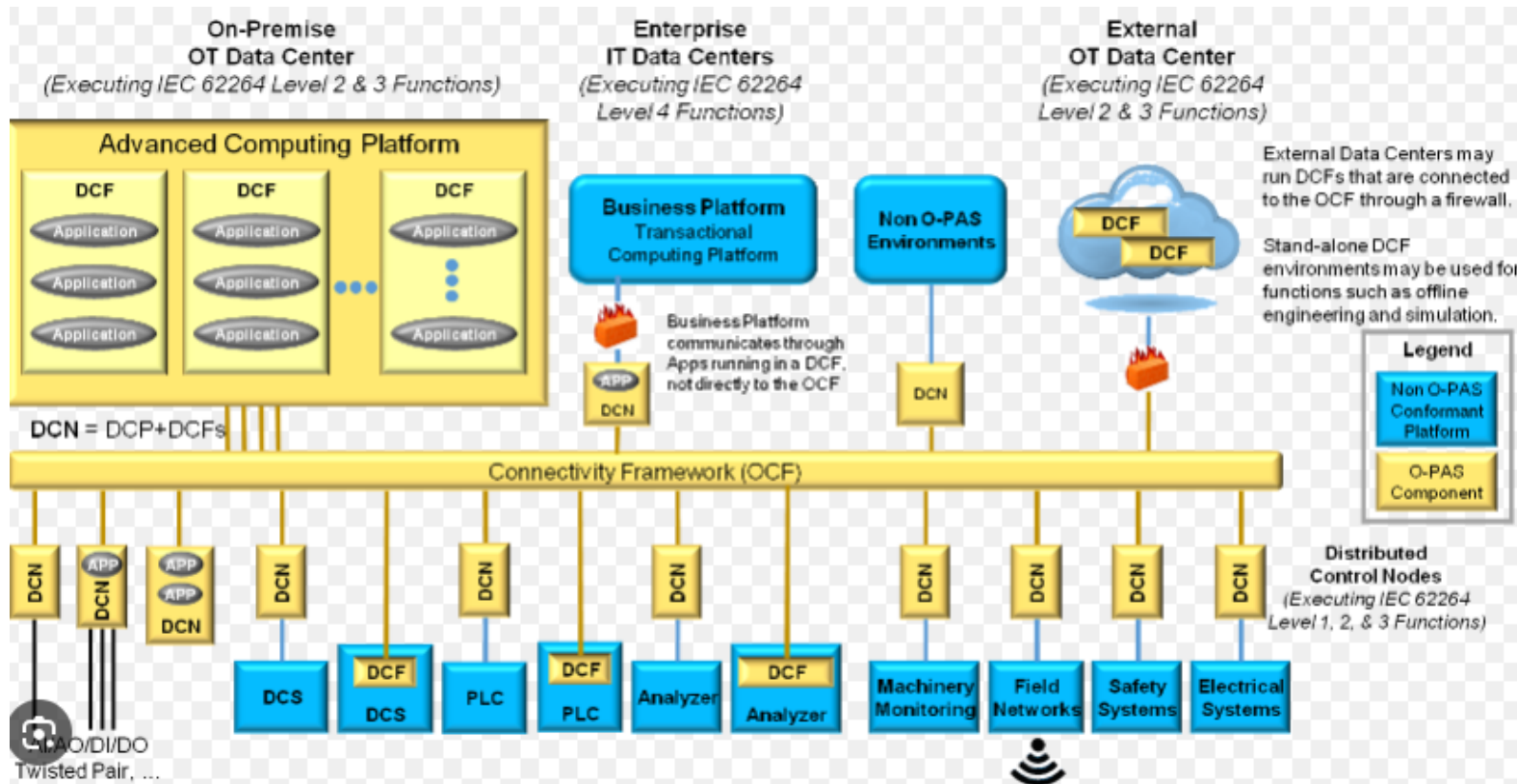
Sample O-PAS architecture

TO BE AWARE OF:

Standards based

Mix and match of hardware suppliers possible in future

Non critical items such as reporting → IT based

IT based eqp is lower cost than OT based eqp

Includes satellite support
(direct sensor to satellite connection)

Process Control Domain
(firewalls / managed (Timeseries) data out)

New standards for interfacing

Acuvate will advise on when to use IT and when to use OT based facilities

Examples of sensors (indoor and outdoor)

acuvate™
...where Acumen drives Innovation

Different types of sensors

Acuvate will advise on what sensor to use when

Rotating torque sensors
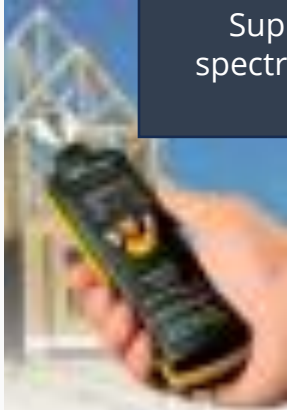
MONITOR:

Battery powered:
One Year or more

Supports various network configs including satellites

All data (IT/OT) stored in Acuvate Data Platform

Sources: Cameras (QA), Cameras on drones (warehouse mgt)

Intrinsic safe

Monitoring volumes

Bi-directional

Support for broad spectrum of interfaces

Edge options for Manufacturing

When to use Edge:

- **Low latency and/or high data throughput is/are needed**

- **What:**

- Compute + Storage very close to where data is collected → Allows for realtime response.
- Compute + Storage in the same region as where data is collected → MS Azure, etc. Cloud based.
- Single platform (ideally Open Source) for all use cases.
- Fully remotely managed.
- Also 5G with support for low latency → 5G has the lowest latency in this market and therefore important.
- Supprt for INTEL / AMD / NVIDIA / ARM processsing → Dependent on use case.
- Different resiliance levels.
- Drones / Robotics (+camera): Collecting images and analyzing realtime (5G + Edge-AI-MV).

Edge usage examples:

- (Remote) Inspection: Using drones with cameras + realtime MV analysis.
- (Remote) platform support & management e.g. Factory production lines.
- (Edge) Quality Control: Immediately action in case of non-compliance without stopping production line.
- Warehouse management.

Acuvate will advise on what edge server to use when

Sensor / Edge Manufacturing examples

Example 1:
- Drone with **5G camera (your sensor)** flying over Factories looking for damages & emissions (resulting in leakages / emissions / etc.).
- Cameras images are set in **realtime** to nearby **Edge device**,
- **AI-MV (Machine Vision)** on Edge analyses the data immediately and **immediate actions** are initiated in case of leakages / emissions / etc.
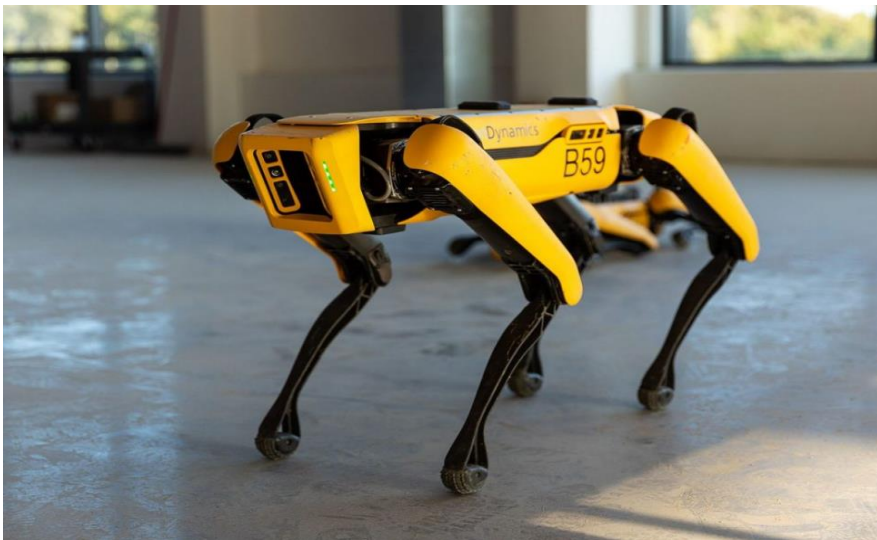
Example 2:
- Robot (with intrinsic safe support) with **5G camera (your sensor)** walks in Factory (for example Operator round)**.**
- Camera images are sent to **Cloud based enterprise Data Platform** (in case not time critical).
- **AI-MV analyses the data** for Meter Readings / broken items / spillage / etc. and in case of issues (like meter readings out of range) **informs Operations.**

acuvate™
…where Acumen drives Innovation

AI-MV such as: Quality Control
More AI-MV examples

AI-ML such as:
Unplanned downtime
impacting production

HSSE
improvements
for Factories

Manufacturing
What we can
help with

IT/OT Integration/
Realtime/ Sensors/ Edge

Energy Consumption
and Benchmarking

Warehouse
Management

Unplanned Downtime Impacting Manufacturing Production

Devices (Machine)

Files and Applications

Connectivity

4G | 5G

Edge Compute

Cloud Compute & Storage

Applications & Services
AI

Inform Decision Makers

Support Decision Making

System Integration
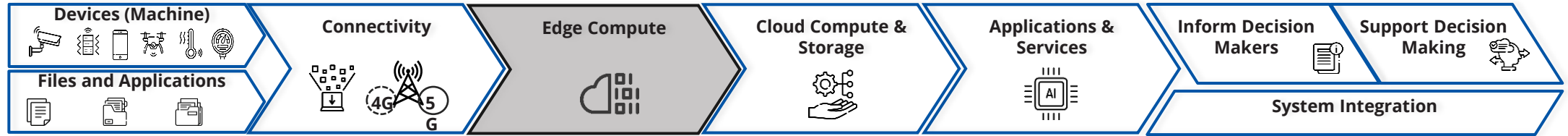
Data Flow

- Sensors deployed on all critical operational assets
- Purpose: Measure pressure, speed, flow, etc.
- OT and IT

- Time series data transport
- Asset data (maintenance records) access

Not time critical at present (predictions timeframe are in days), may change when real time prediction is required from other equipment

- All data from the edge sensors (both historical and real-time)
- Enterprise storage is company owned

- Predict future asset failure using ML models, initial improving model
- Potential PaaS-based set up, not company-owned

- Only reporting potential future failure so action can be taken in time

Application Logic

Scenario

1
- **Identify critical assets** such as engines, fridges, belts, compressors, etc.
- **Collect event and/or timeseries data** from these critical assets, potentially using sensors.
- Collect as much data as possible from selected assets and surroundings as ML models will be strengthened with more data.
- If there is a lack of data, look at options of creating and using synthetic data.

2
- Timeseries data will be stored long term in Enterprise storage.
- AI (ML) application requests all the data it needs for ML model development, from Enterprise storage to copy in its own storage cache.
- Development of the ML model is done through an iterative process and a quality **ML model** (fully data driven) will require multiple steps **to detect anomalies/potential failures.**
- SME involvement working with data scientists is required to develop the model.
- Models will be stored and maintained by AI applications.

3
- The **process from data collection to execution of models is fully automated**.
- **Only alerts to operations in case of anomalous data behavior** (e.g., resulting in expected asset failure in X days).
- **Operations takes action** to replace suspected assets in time, therefore avoiding unplanned downtime.
- Various options for visualisation of entire operations (e.g., XR options on OpenXR platform).

Expected Benefits

- Proactive detection of abnormalities and preventative actions
- Improve productivity from reduced unplanned downtime
- Reduce maintenance cost due to early spotting of issues
- Shorter turnaround times due to more targeted maintenance

Key Value Creator
Increased availability of the plant translates to increased productivity

Note: AI – Artificial Intelligence, ML – Machine Learning, MV – Machine Vision

Digitalized Preventative Maintenance for Factory's Optimal Production Speed

acuvate
...where Acumen drives Innovation

Before: Fixed-interval + Conditional Maintenance

- Fixed: Less conditional awareness
- Conditional: Risky, maintain only failure sign shown
- Machine shutdown for manual data/alarm collection
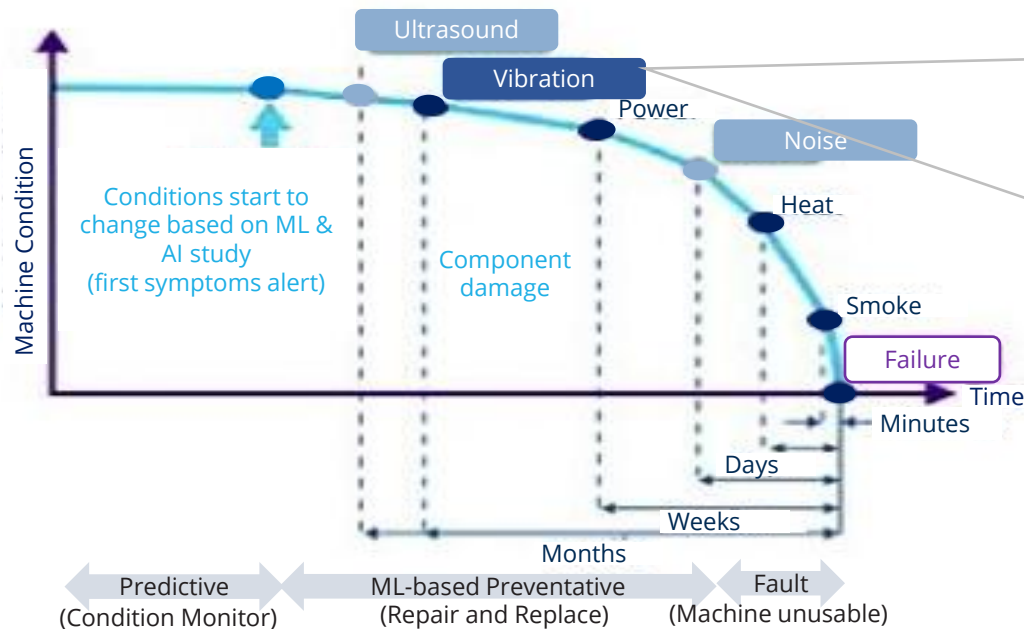- Longer downtime, less productivity

After digitalized: ML-based Preventative Maintenance

- Apply sensors on motor for timely and more frequent data collection
- Apply ML/AI over historical/real time data to predict upcoming machine failures
- Fast exception detection and troubleshooting; Longer service life
- Stop the machine if exceed warning threshold (E2E Latency: < 10ms)

01 | **In preventative maintenance, sensors are available to monitor all aspects of motors, allowing to see damaging trends over time**

Deterioration curve and related machine condition signals

Machine Condition

Ultrasound
Vibration
Power
Noise
Heat
Smoke
Failure
Time

Conditions start to change based on ML & AI study (first symptoms alert)

Component damage

Minutes
Days
Weeks
Months

Predictive (Condition Monitor) — ML-based Preventative (Repair and Replace) — Fault (Machine unusable)

Amount of energy / frequency spectrum in vibration of motor with its relative machine's faults

Imbalance | Looseness | Output Shaft | Gear Defeats

Different levels of noise and frequency bandwidth

Source: Market Study/Engagement
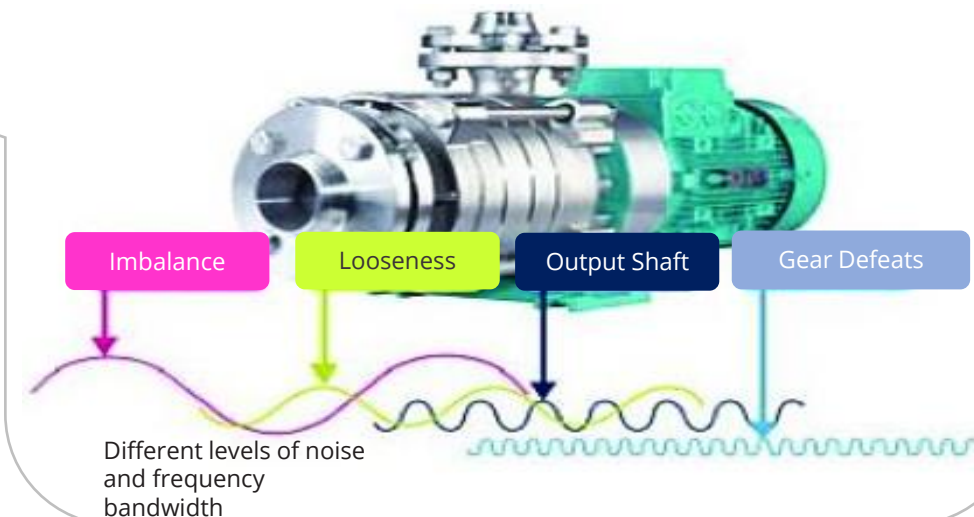
(5G) Based Data Collection Provides Flexible Production Adjustment

02 Enables machine learning-based predictive maintenance through real-time data analytics of multiple sources of time-stamped historical and real time sensor data

Cloud Analytic Engine (Application 1)   Cloud Analytic Engine (Application 2)   .....   Cloud Analytic Engine (Application n)

Decision Optimization

Factory

Manufacturing Site

2. Multi-source of historical and real-time AI-driven data support proactive analysis and action

Real time sensor data
- Pressure
- Temperature
- Vibration
- Faults
- ...

Data Storage

Historical data
- equipment type
- equipment age
- maintenance records
- scheduled event
- unscheduled event
- ...

Device and Data management dashboard

3. Notify sensor status for preventative maintenance & lifecycle maintenance

1. Collect and detect the time-stamp sensor data such as temperature in real time

IoT Platform/ Controller

5G Network

4. Feed sensor analysis result back to machine i.e. command to stop

I/O-Link Master

RFID Reader

5G Industrial Router

I/O sensors

RFID

WiFi

Connectivity Requirement
- Uplink: <20Mbps (depends on no. of aggregated data collection)

Source: Market Study/Engagement

**AI-MV such as: Quality Control
More AI-MV examples**

AI-ML such as:
Unplanned downtime
impacting production

HSSE
improvements
for Factories

**Manufacturing
What we can
help with**

IT/OT Integration/
Realtime/ Sensors/ Edge

Energy Consumption
and Benchmarking

Warehouse
Management

Quality Control on Manufacturing lines need improvement

Devices (Machine) / Files and Applications	Connectivity	Edge Compute	Cloud Compute & Storage	Applications & Services	Inform Decision Makers / Support Decision Making / System Integration
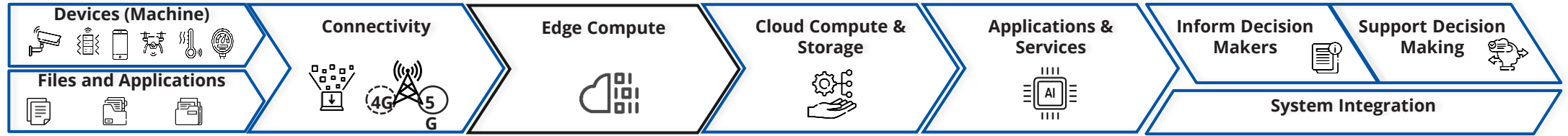
Data Flow

- Sensors to be added to monitor quality-related data
- Type of sensors driven by type of man: cameras (various); specs to monitor; etc.

- Equipment sensor data transport

- It is expected that the majority will be real-time based, so direct intervention is possible
- Defective products to be separated in real-time

- Equipment data stored to train AI algorithms
- Storage is Enterprise owned

- AI (ML/MV) applied to detect goods anomalies in various forms and provide insights on quality control

- Alert-based notification of quality anomalies

Application Logic

Scenario

1
- Install relevant sensors with focus at real-time intervention since that has the best financial impact.
- Make a list of the quality aspects in order of importance then decide what sensors are needed.
- With 5G, the amount of bandwidth needed is not a constraint. Therefore, take this into account when selecting sensors.
- Cameras should have High-Definition image quality.

2
- SME and data scientist are required and will work as a team.
- **It is expected that Edge will be the prime home for AI in this case.**
- Ensuring that all data always goes to the Enterprise store.

3
- Develop the AI (ML / MV) models highly interactively to get quickly to the right quality level for this job.
- Link to industry quality standards when developing these models.

Expected Benefits

- Automation increases quality control sample sizes and improves accuracy of detection
- Detection allows early rectification of production workflow and therefore reduces wastage

Key Value Creator
Detection of quality issues in real-time for increased productivity

Note: AI – Artificial Intelligence, ML – Machine Learning, MV – Machine Vision, SME – Subject Matter Expert

# Machine Vision Defect Detection Quality Control Improves Productivity

Before: Manual Checking

- Less effective quality assurance
- Quality control depends on inspector's experience
- Limited working hours / higher labor cost in workshop due to ESH consideration
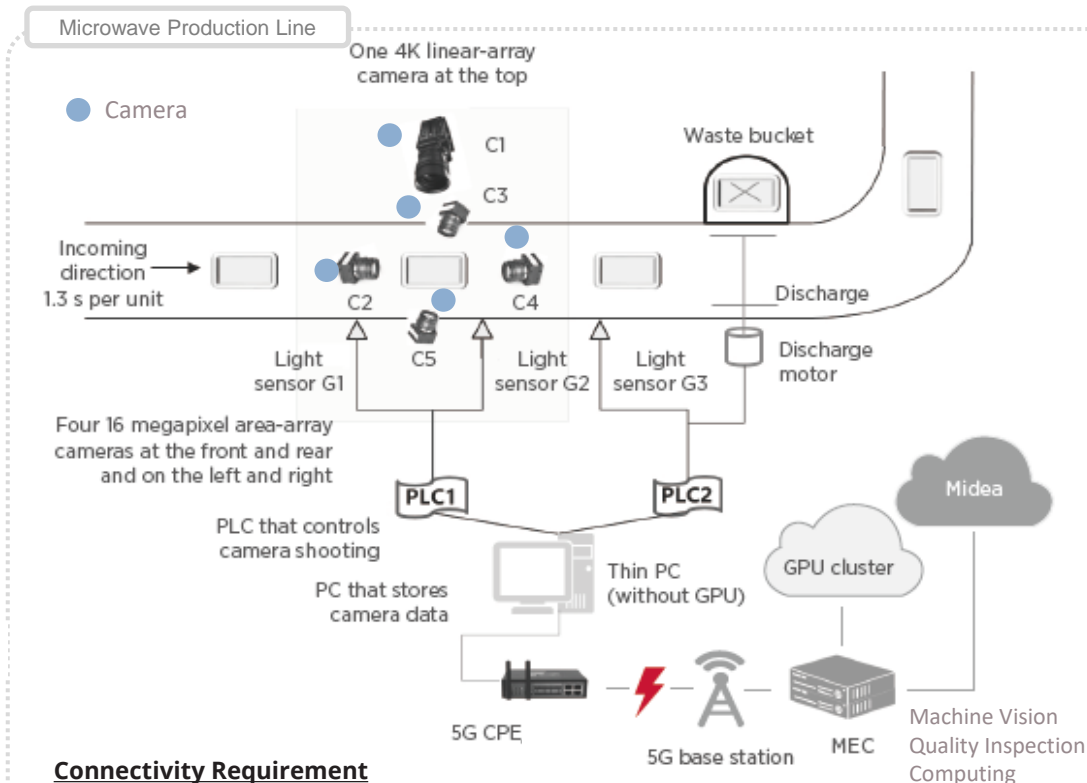
After: 5G + AI Quality Checking
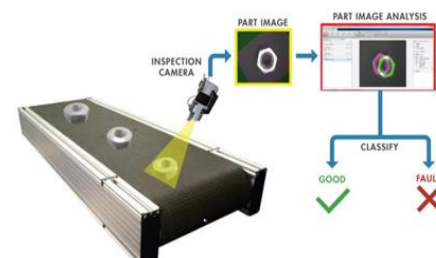
Computer-vision for hot-rolled sheet surface

Crazing Inclusion Patches
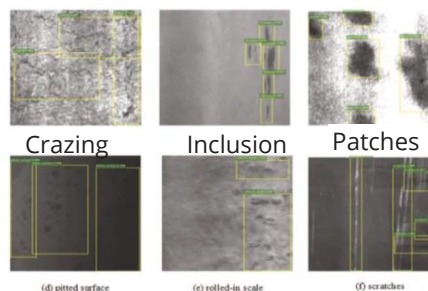
Pitted surface Rolled-in scale Scratches

- Reduces error and misdetection
- Increase productivity
- Flexible production line adjustment with wireless network and cameras

Connectivity Requirement

- Uplink: 40~200Mbps (depend on image quantity & pixel or no. of video camera)
- Latency: 20~50ms
- Other: MEC (Machine Vision Quality Inspection Computing)

Source: Market Study/Engagement

ACUVATE'S ELEMENTARY MANUFACTURING SERVICES

elementary

ELEMENTARY AI QUALITY PLATFORM

Enabling Closed Loop Quality

VISION

Business Value

- Increase Inspection Accuracy & Reliability
- Reduce Reliance on Labor
- Improve Traceability
- Lower Risk of Market Impacting Events
- Data/Analytics for Continuous Improvement

ML driven visual inspections

CLOSED LOOP

Embedded analytics
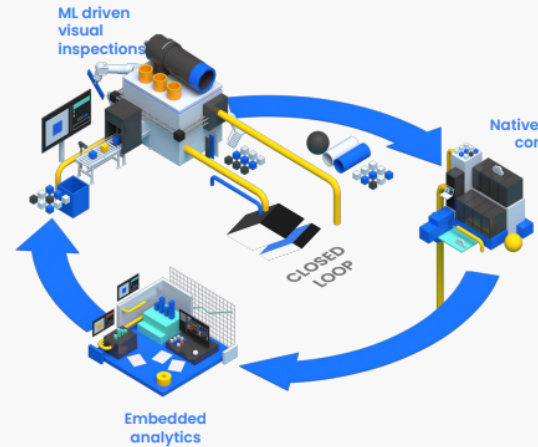
> Acuvate complements this new Elementary solution by providing trained Acuvate staff for the physical implementation and configuration on your Factory production line; Once installed providing ongoing remote operational support out of our Elementary support center and when needed fast updating of the AI models supporting changing in labeling, bottles, etc.

Our vision AI finds defects previously undetected and drives insights and actions previously unknown

1 ADVANCED ANOMALY DETECTION
Train a specialized AI model for your product with Elementary, ensuring a lightweight yet highly effective solution for detecting even the subtlest and rarest
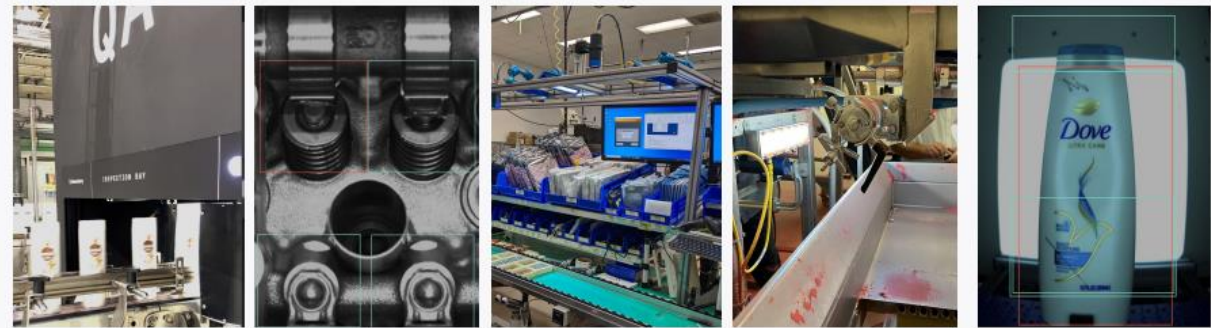
2 CLASSIFICATION & ROOT CAUSE ANALYSIS
Go beyond simple pass/fail judgments with Elementary's cloud-native platform, offering detailed defect analysis and immediate corrective action suggestions.
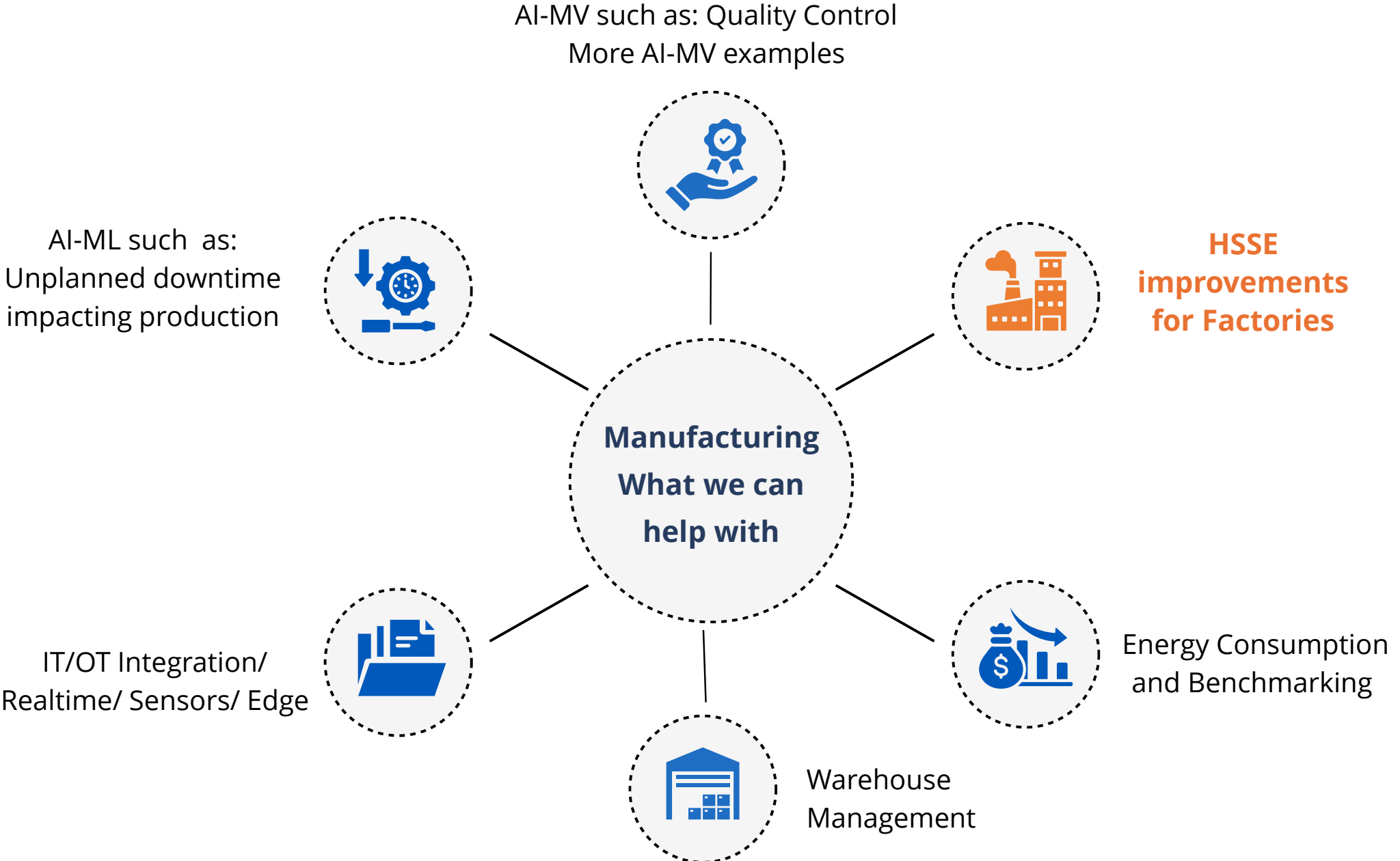
3 EDGE & CLOUD INTEGRATIONS FOR CONTROLS
Once we've found your defects, classified and associated a root cause, now we're able to share that data natively at the edge with control systems and in the cloud via API to any MES/QMS.
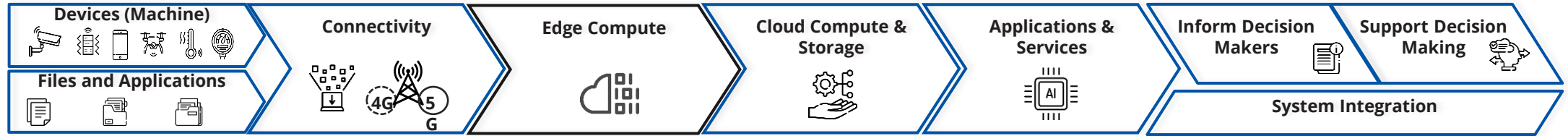
Fit for all manufacturing environments

OUR INDUSTRIES

CPG | Automotive | Medical | Food & Beverage | Plastics

AI-MV such as: Quality Control
More AI-MV examples

AI-ML such as:
Unplanned downtime
impacting production

HSSE
improvements
for Factories

**Manufacturing
What we can
help with**

IT/OT Integration/
Realtime/ Sensors/ Edge

Energy Consumption
and Benchmarking

Warehouse
Management

Lowering number of HSSE incidents

acuvate™
...where Acumen drives Innovation

Devices (Machine)	Connectivity	Edge Compute	Cloud Compute & Storage	Applications & Services	Inform Decision Makers	Support Decision Making
Files and Applications					System Integration	

Data Flow

- Cameras (fixed / drones / robotics / people) and sensors capture real-time behavioural, asset and facility insights
- (all images)

- Video, imagery and sensor data transport

- Time-critical: Edge AI camera will identify anomalous behaviors and defects in facility.
- Other data is stored in the cloud.

- All collected data stored in Enterprise storage

- AI applied to detect potential threats and hazards and ensure compliance (PaaS)

- Alert-based notification of suspicious activities

Scenario

Application Logic

1
- Cameras, sensors and edge devices installed throughout the facility to gather high-resolution video and imagery data.
- Drones are deployed to increase coverage (including hard to reach areas) and transmit live data through 5G.
- **Camera coverage drives the quality of the HSSE coverage.**
- Cameras should have High-Definition image quality.

2
- AI (MV) models created using the data gathered to manage infrastructure, staff and operational risks.
- Data processed by AI at 5G edge generates real-time virtual fencing for automated occupancy management (e.g., lifting of goods).
- Machine vision (5G-based) can detect real-time potential threats.

3
- Automated compliancy to safety standards such as OSHA, IOGP 577, CCOHS
- Actionable insights generated can provide decision makers with recommendations to prioritise specific tasks
- AI-generated inspection checklists and emergency response plans

Expected Benefits

- Worker safety (real-time monitoring & hazard alert)
- On-site worker safety compliance/ PPE/ cost reduction
- Increased productivity (reduced hazards/ accidents)

Key Value Creator

Reduced number of safety incidents and related work absenteeism with improved staff morale

Machine Vision Provides Real Time Security Inspection for Early Detection

AI for Personnel Safety

Outfit detection

- Identify outfit of employees whether meets safety protection standards, such as safety helmets, purifier caps, workwear, and insulation boots.

Geo-fencing

- Camera + AI analytic for detection
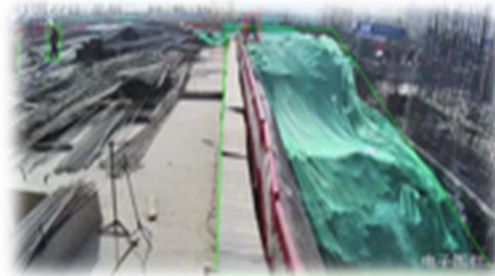- Identify workers and generates alarm if someone enters dangerous zone

Sending photo

5G

Command to stop

Face recognition

Critical zone

People detection

Warning Zone

- Real-time Image recognition monitoring to detect non-compliance of safety regulations
- Generate automated alerts and halt dangerous machinery when trespassing occurs

Pre-warning instead post-incident alert

Behavior detection

- Camera + AI analytic for detection
- Detect mobile phone usage and smoking

Fire and smoke detection

- Sensors + AI analytic for detection
- Generate alarms when detecting fire or smoke

Energy Consumption: Collect data about energy usage of any plant + identify the most consuming parts of the plant using GenAI:

- It is first all about collecting the data: Operational data on energy usage; Do we need more sensors? Which components use most energy; Which components can be switched off, etc.

- Start small and grow with focus at high energy usage parts.

Energy examples:
- Can we replace a given energy in efficient component? Use Gen-AI to find out?
- Have we switched off all devices not being used for now to maximize energy savings?
- Compare energy consumption of production lines --> Have sensors to monitor engine, optimum usage?

AI-MV such as: Quality Control
More AI-MV examples

AI-ML such as:
Unplanned downtime
impacting production

HSSE
improvements for
Factories

**Manufacturing
What we can
help with**

IT/OT Integration/
Realtime/ Sensors/ Edge

Energy Consumption
and Benchmarking

**Warehouse
Management**

Edge support for time critical activities:
- There is an increased need for warehouses to be smart, intelligent, and automated. At the heart of Smart digital warehouse, is a combination of a mesh of connected devices and algorithms that can transform the sensor-generated data into actionable insights.

Robot support for unmanned Automated Guided Vehicles (AGVs):
- AGVs are an essential tool for businesses to automate their warehouse operations and maximize efficiency. AGVs are capable of navigating warehouses without human intervention, allowing for faster order fulfillment, reduced labor costs, and improved accuracy.
- Also AGVs can provide real-time visibility into all aspects of the supply chain, allowing organizations to respond quickly to changes in customer demand and capitalize on market opportunities with digital warehouse transformation.

Drone support for special deliveries:
- In addition to inventory management inside the warehouse, drones are expected to make a huge impact for product delivery.

Coverage: Assembly; Transport; Packaging; Sorting; Shipment; etc.

Acuvate 7 step approach is important since Data collection + Data Warehouse + all are needed to get to the Business Value.

Digital Solutions for Manufacturing with Data & AI

Factories

Supply Chain – Logistics and Warehousing

Efficiency Improvement with Smart Factory	Data Democratisation for connected workers	Process Automation with RPA/ML	Computer Vision/Machine Vision
Improved OEE of a large CPG firm by 20%	Reduce time to insights from IoT data with Gen AI by 80%	Email classification and automation with Gen AI to improve customer productivity by 90%	Cost savings of $7M/year using Machine Vision to pre-check-in trucks
Sustainability goals	Co-pilots for knowledge capture, Maintenance and troubleshooting	Procurement automation	Health and Safety

Scan this QR for More Case Studies

Poll 3

How likely are you to explore **Acuvate's Data Platform and Digital Framework** for your Manufacturing-related projects?

We have Advisors very familiar with the Manufacturing market, all its business elements and the Acuvate approach as explained, at an high level, in this pack.

These Advisors will help you to define the problem / challenge / issue you need to get solved.

Once defined they can give you a first approach how to get this solved.

Scan this QR & connect with Advisors
OR
or Write us at advisors@acuvate.com

We will respond you within 24 hours

Visit our company site www.acuvate.com for all information

ACUVATE

Where Acumen Drives Innovation

We are a global player in next-generation digital solutions & services that modernize, automate and transform enterprise applications. With over 17 years of experience, we have been enabling our clients globally to steer their digital transformation strategy using Cloud, Data & AI. We build & develop smart & sustainable solutions to help our customers transform their conventional processes to match the next-generation technological trend. We have a strong presence in the US, Europe, and Middle East, where we serve multiple ultra-large customers as well as SMBs from various sectors such as Public Sector, CPG, Retail, Oil & Gas, Energy, Manufacturing, BFSI, Healthcare, etc.

We specialize in New-age AI solutions, Migration & Modernization, Data & Analytics, Digital Workplace Solutions - like Power apps, Teams apps, Virtual Agents and more. We have transformed several reputed enterprises globally, including many Fortune 500. With our multi-skilled experts and packaged AI accelerators, we deliver unparalleled efficiencies and accelerate time-to-value for our customers.

Contact: info@acuvate.com

THANK YOU

acuvate
... where Acumen drives Innovation