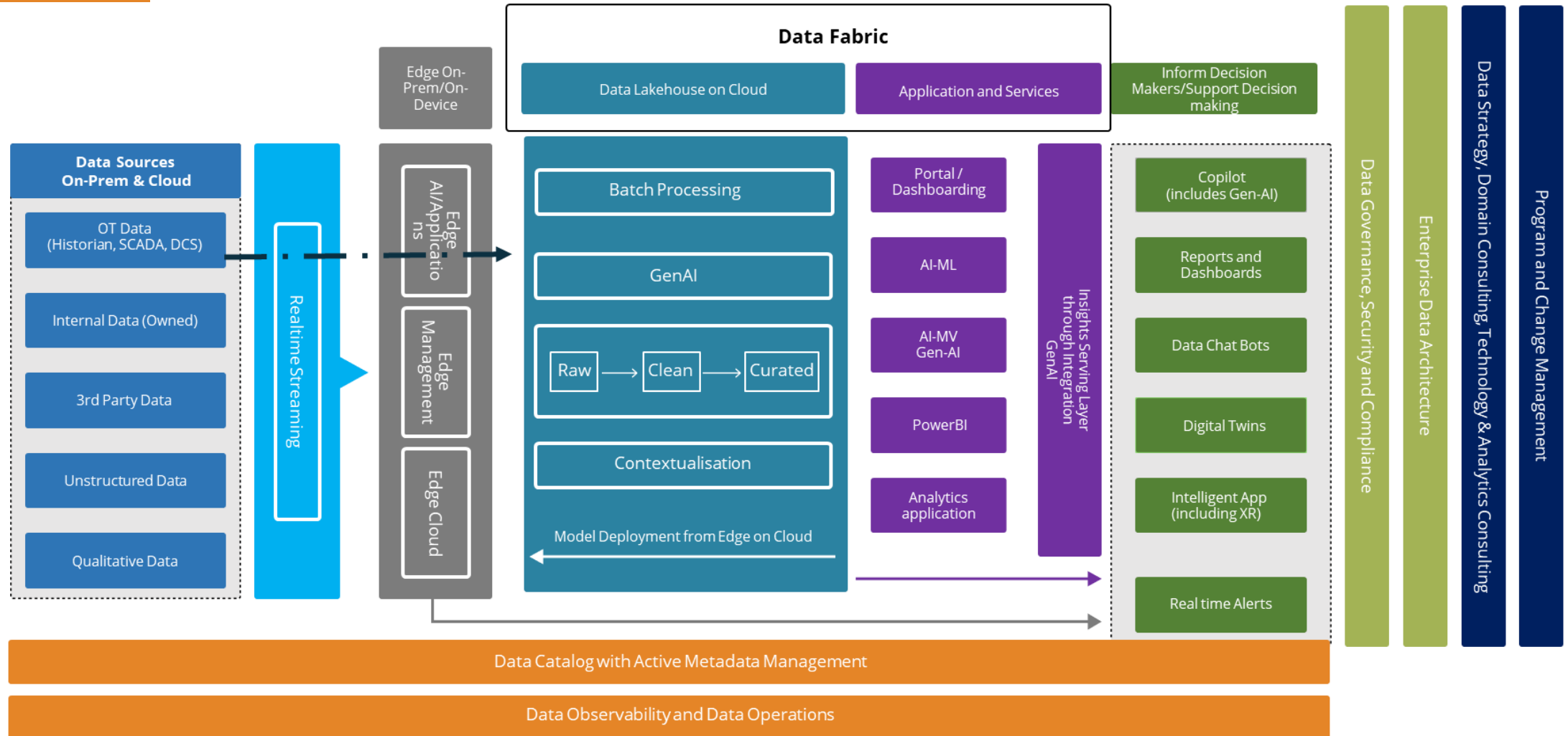


# SYNERGY FOR ENERGY 2024

HARNESSING AI & DIGITAL DATA FOR OIL & GAS EXCELLENCE

How Acuvate can help  
Energy (Oil & Gas) Industries using  
our Business solutions  
getting the maximum out of **DIGITAL**

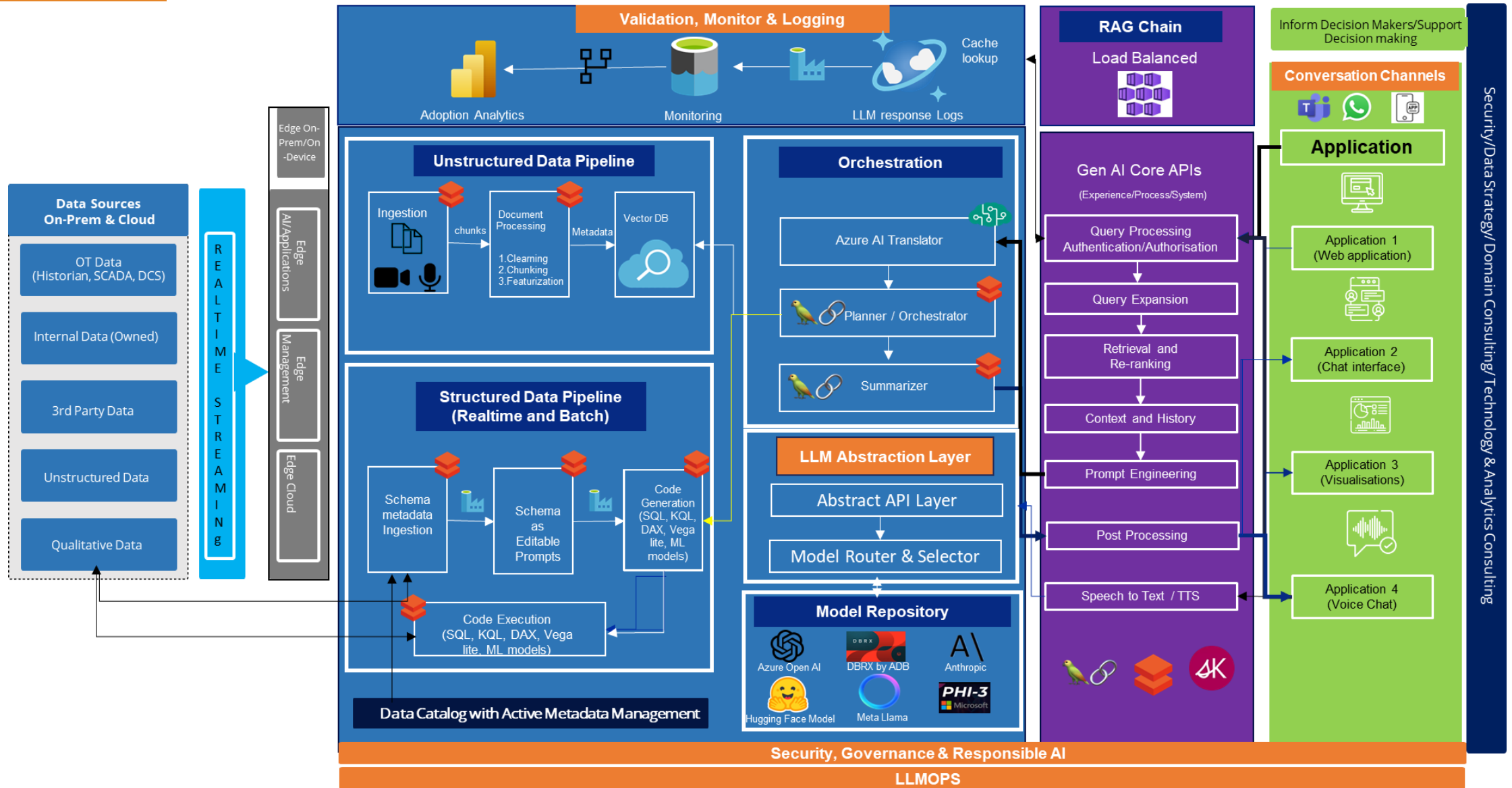
# Acuvate's Industrial Intelligence Data Platform – Master



- Databricks based with (OIL&Gas) Energy extensions supporting PI data
- MS Fabric for smaller sites
- Runs on Cloud (MS Azure)

- Includes KAFKA for streaming.
- Fully preconfigured so fast installation & efficient ongoing oper. support
- Installed in customer MS Azure subscription

# Acuvate's Centralized GenAI platform architecture





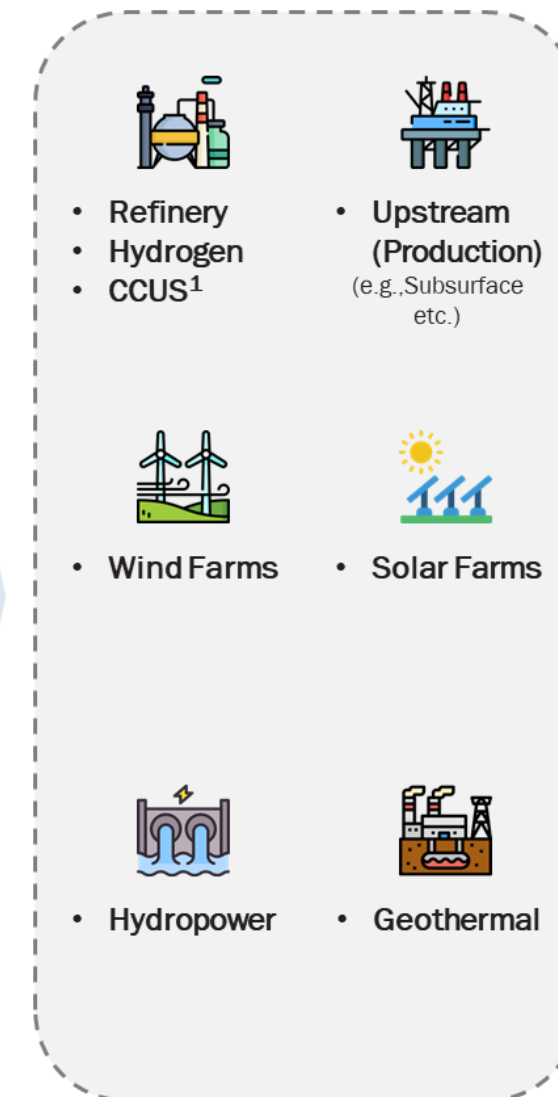
# Overview of **Energy** **Pain Points** to be addressed

[Visit Now](#)



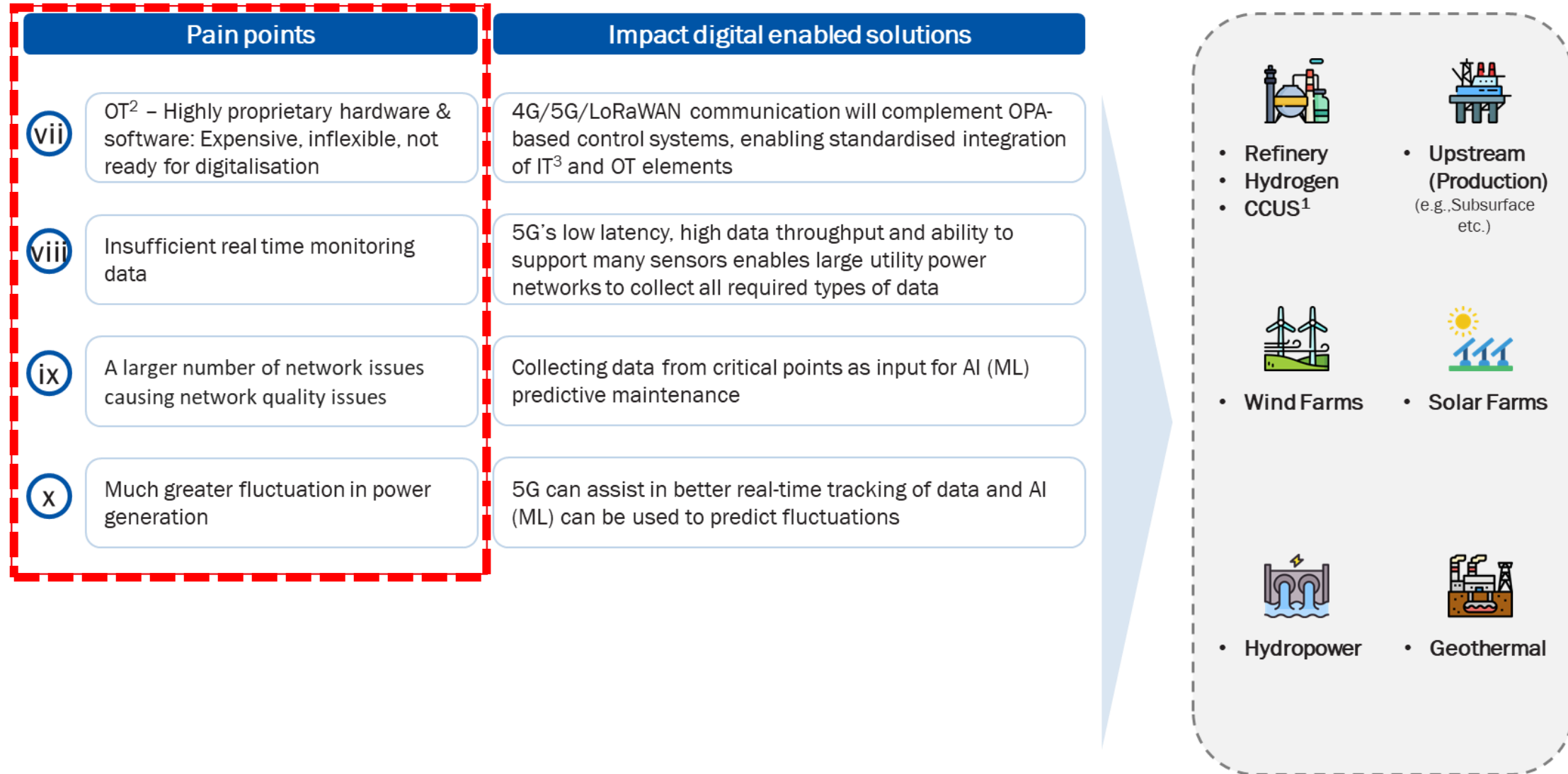
# Common pain points within the Energy industry to be addressed using various Digital Services solutions (1/2)

Pain points		Impact of digital enabled solutions	
i	Unplanned downtime impacting production		Improve asset availability through forecasting early fault detection in critical components and subsequently conduct proactive replacements
ii	Leakages leading to safety hazards and negative environmental impacts		Real-time transfers of high-definition imagery data and asset maintenance data can help identify potential leaks / emissions in the infrastructure
iii	Inability to move towards autonomous (i.e., reduced staff) plants		Obtaining from a broad range of sensors real-time transfers of data enables AI real-time decision making to drive autonomous operations
iv	Siloed data leads to operational inefficiencies		Large amounts of data can be transferred from various data sources ensuring accurate, aligned and timely information
v	Reducing number of Health, Safety, Security and Environmental (HSSE) incidents		Automated camera sensors around the plant can track, manage and predict potential occupational hazards in real-time and ensure compliance
vi	Inability to manage, integrate and optimise data from various energy data sources		Acuvate Data Platform enabled AI can process vast amounts of information from all energy data sources in a unified structure enabling efficient management



Note: <sup>1</sup>CCUS – Carbon capture, utilisation and storage

# Common pain points within the Energy industry to be addressed using various Digital Services solutions (2/2)



Note: <sup>1</sup>CCUS – Carbon capture, utilisation and storage, <sup>2</sup>Operational Technology, <sup>3</sup>Information Technology

# How Acuvate Business Solutions do address common business challenges / Pain Points

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... where Acumen drives Innovation





# Acuvate solution: Gen-AI supported Overall Equipment Effectiveness (OEE)

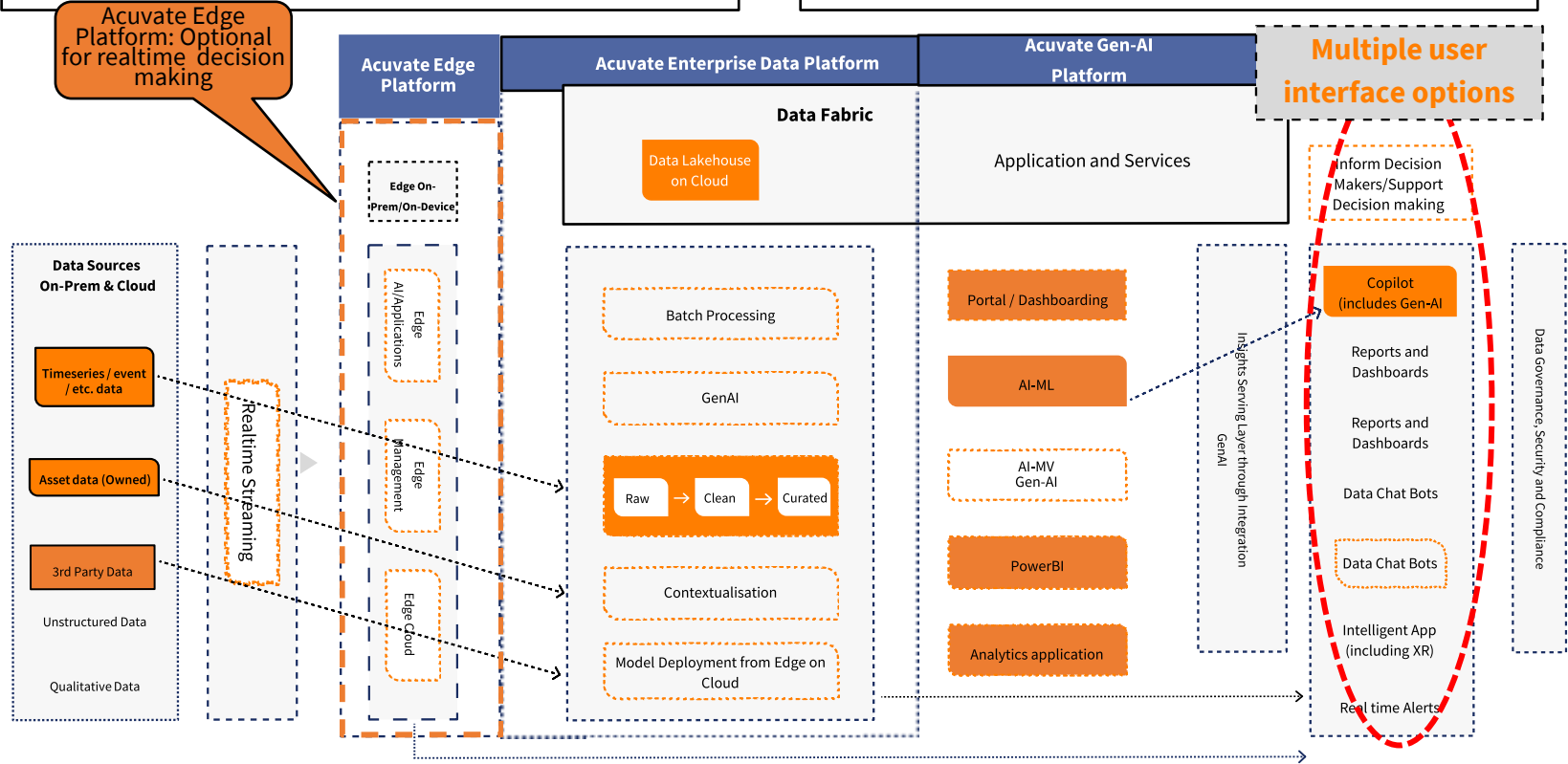
### When deployed

OEE is the industry standard for measuring manufacturing productivity. OEE is calculated using 3 attributes: **Availability: Performance & Quality**. The Acuvate Data Platform collects all data and includes the hooks to make these calculations.

### Business value

Based on the OEE standards which are well known in Manufacturing the factory owner can see how efficient the facilities are used and using Gen-AI we give advise what can be done to improve.

### Usage cases



### Hints & Tips

**Verticals :** Energy & Manufacturing.

Look at <https://www.oee.com/> for more detailed OEE info.

OEE takes into account all losses. An OEE score of 100% means you are manufacturing only Good Parts, as fast as possible, with no Stop Time.

OEE = Availability \* Performance \* Quality. Using Gen-AI as part of the User Interface can help to indicate the real issue when the overall scoring is less than 100%.

Ongoing (SLA) Operational support available

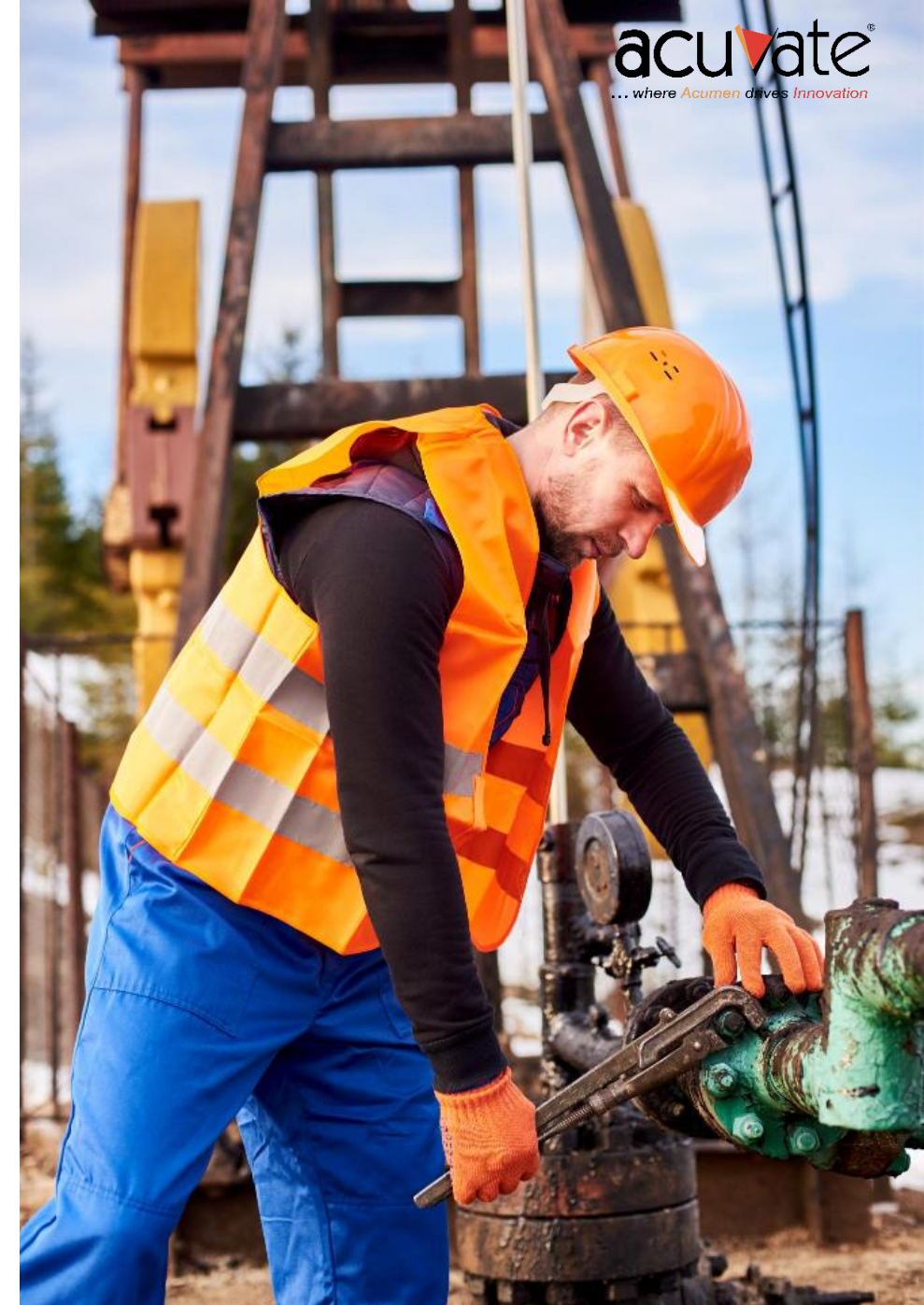
Ease of use implementation Indicator (1-5): **4**  
(1 = difficult and 5 = easy)



# Acuvate solution: Gen-AI enabled Optimized Production Line settings (OEE)

## • OEE (Overall Equipment Efficiency) for Energy:

- Discrete Manufacturing:  $OEE = Availability * Performance * Quality$
- Oil & Gas Energy:  $OEE = Availability * Throughput * Yield$
- The Aberdeen Group reports that on average, oil and gas companies have OEE of about 73 percent compared with process industry leaders with scores in the high 80s.
- (Availability) Availability: Availability takes into account Unplanned and Planned Stops. An Availability score of 100% means the process is always running during Planned Production Time:
  - **Example of improving availability is Predictive Maintenance: More info some slides later.**
- (Throughput) Performance: Performance takes into account Slow Cycles and Small Stops. A Performance score of 100% means when the process is running it is running as fast as possible:
  - **Collect event data from all critical locations / equipment / pipelines / wells / to spot early hurdles: Operator rounds collecting data.**
- (Yield) Quality: Quality takes into account Defects (including parts that need Rework). A Quality score of 100% means there are no Defects (only Good Quality are being produced):
  - **Outcome is impacted by above factors: Show Production numbers: Changes / Predictions for coming weeks and reasons why not what it should be.**
- **Gen-AI does enrich the information given to users over and above other user interfaces → Will be demoed later this afternoon.**



# Acuvate solution: Operations: Leakage / Spillage / Emissions detection



## When deployed

Using Camera (fixed / CCTV / Drones or Robots based) images as input for AI-MV to validate whether there are leakages, spillages or emissions and if so immed warn Operations in the agreed way (dashboard/reporting/digital twin/etc. Using (autonomous) Robots this can replace Operator rounds.

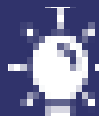


## Business value

Earlier spotting these problems means that they cause no or less damage or threat to Operations and therefore to production availability levels.



## Usage cases



## Hints & Tips

**Verticals :** Energy & Manufacturing.

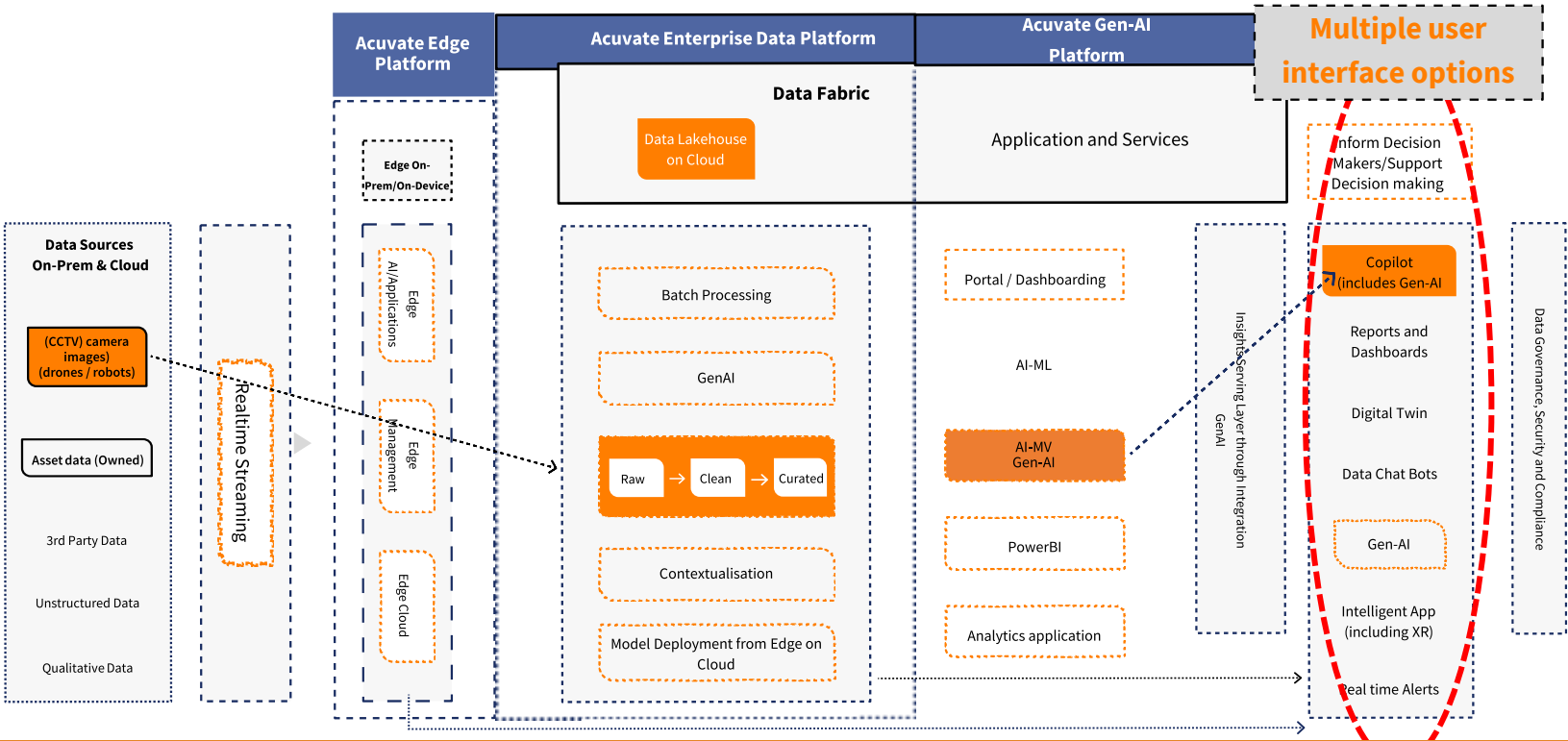
Could start with existing (digital) CCTV cameras and add, where needed, more cameras over time. Cameras can be on a fixed location, on Robots or on Drones. Robots can be intrinsically safe as well (OT).

AI-MV modeling to analyze images coming in; When running on Acuvate Edge Platform based on results immediate instructions can be given to relevant business process.

Consider 5G cameras since they offer the throughput to get image data immediate to Acuvate Edge Platform when time critical (realtime action needed) or Acuvate Enterprise Data Platform when not time critical.

Ongoing (SLA) Operational support available

Ease of use implementation Indicator (1-5): 4  
(1 = difficult and 5 = easy)



# Acuvate solution: Operations: Leakage / Spillage / Emissions detection

- Increasingly using Robots for Operator Rounds:

- Are as well **intrinsic Safe** → Process Control Domain.
- Different type of Robots: Walking (like **AMVbotics**) and on Tracks → More flexibility with walking robots: Going upstairs, etc.
- Robots are taking over **Operator Rounds**:
  - Spillage
  - Leakage
  - Emissions
  - Meter reading
  - Valves Open / Closed
  - Damages
  - Etc.
- On (offshore) Production Platform:** With Private 5G (near) realtime camera image collection, AI – Machine Vision image analysis and resulting action taking → As an example could be an (Advisory) Setpoint





# Acuvate solution: (Co-Pilot) Digital Twins / PowerBI (reporting) / XR (3D)



## When deployed

Presenting results in a way best fitting a particular role: This can be based on simple dashboarding; Reporting or by means of an Digital Twin where a complete dynamic 3D image of the facilities is provided with live data streams always giving uptodate information.



## Business value

Showing results / actions / etc. the most relevant way for your job leading to faster decision making, better usage of resources & ultimate more efficient production



## Usage cases



## Hints & Tips

**Verticals :** Energy & Manufacturing.

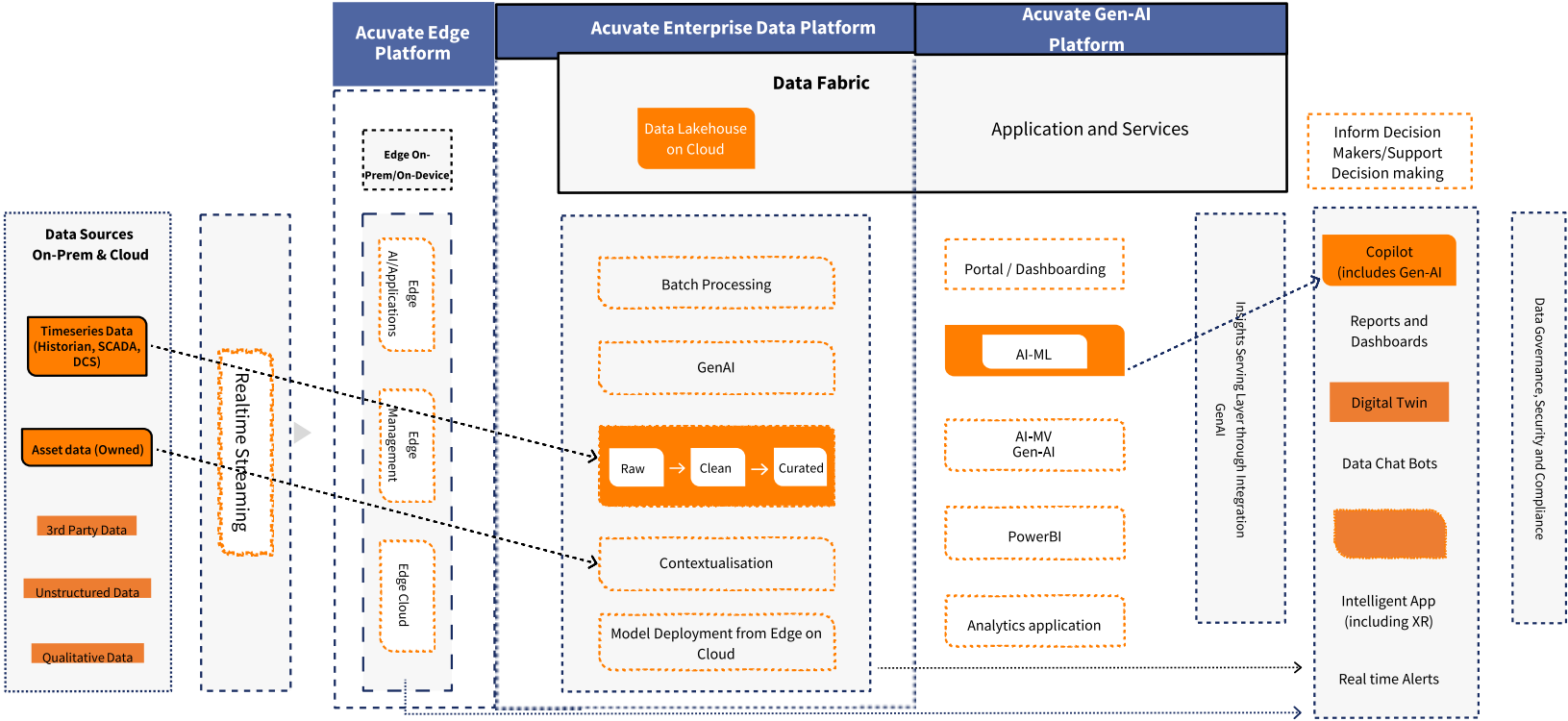
Offering flexibility of User Interface linked to your role.

In more and more cases Gen-AI plays by means of Co-Pilot as well) an role in combination with other ways such as Chart Bots, Digital Twins, etc.

We also link to XR (Extended Realty) based on VR or AR and the new headsets coming to the market of interest to certain roles. Autonomous whereby Analytics makes and executes the decision without human intervention such as setpoint.

Ongoing (SLA) Operational support available

Ease of use implementation Indicator (1-5): 2  
(1 = difficult and 5 = easy)





# Acuvate solution: (Gen-AI (Co-Pilot)) Digital Twins

## • Digital Twin (KDI Kognitwin):

- (Near) Realtime data feeds but showing as integrated data sets.
- **Data Contextualisation:** P&ID; Timeseries, Asset data & others.
- Important as well for **Turnarounds:**
  - Simulate all actions before done in real as part of Turnaround → Reducing time for Turnarounds.
- Making **Predictive Maintenance** predictions visible.
- Have integrated **simulations.**
- **Enrich Operator steer with Gen-AI:** Get more complete answers.
- Important that asset information is always uptodate → **Discipline.**



# Acuvate solution: Predictive Maintenance for critical business processes



## When deployed

Using Timeseries / ERP data & AI – Machine Learning (ML) based modeling predicting days in advance with critical components (such as engines, turbines, compressors, pumps, valves, etc.) are expected to fail. This allows time (for maintenance staff) to replace the potential failing component(s) before they break down

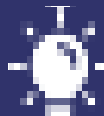


## Business value

Increased availability (in %) of the production platform & less time required for regular shutdowns : Therefore more production (barrels / gas) and as a result increased revenue (\$\$\$).



## Usage cases



## Hints & Tips

### Verticals : Energy & Manufacturing.

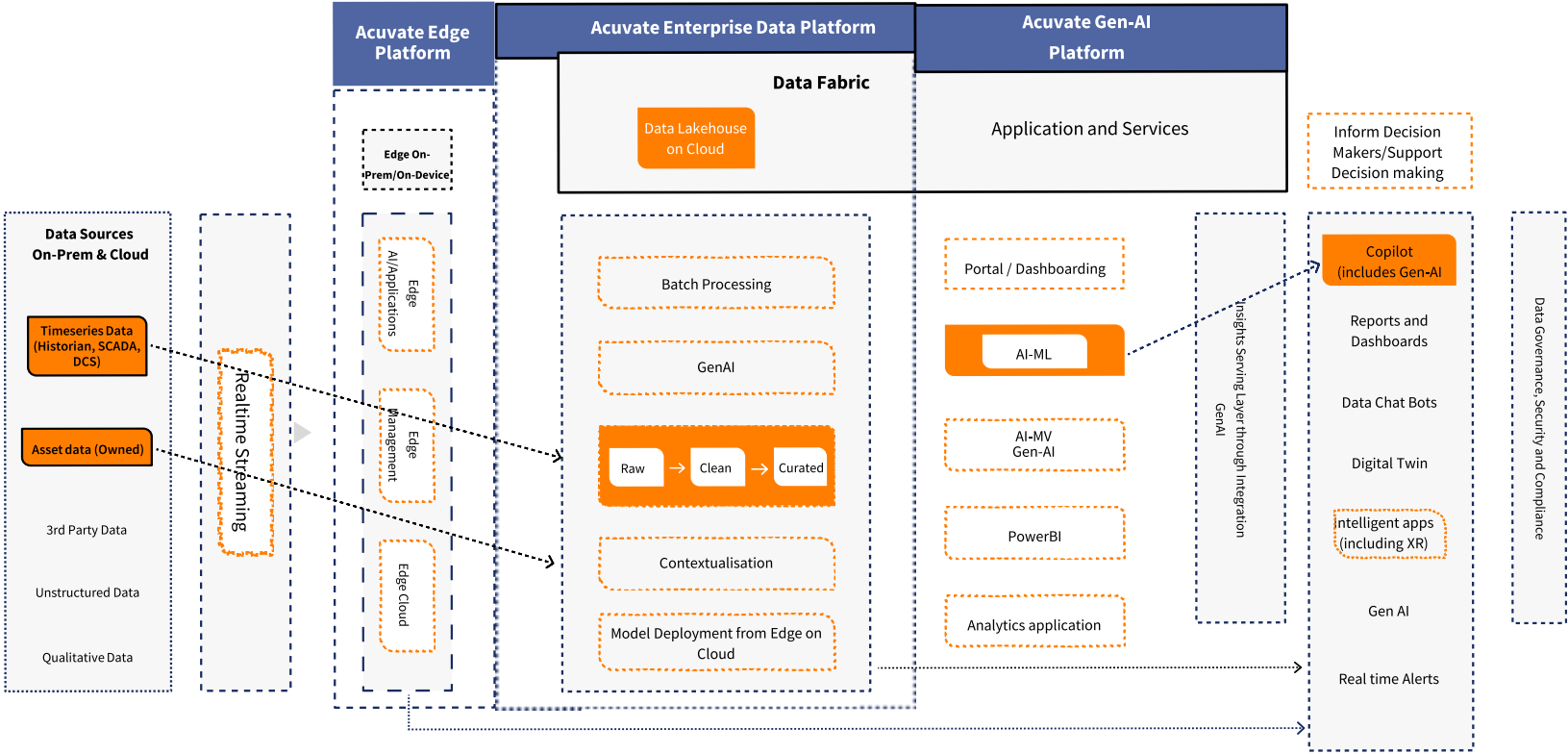
You to select all critical rotating components part of business processes. Since business case can be made more easily good AI-ML application to start with.

AI – (ML) Modeling: Based on the Acuvate starting model, normally input needed from customer SME for AI-model to get correct in a number of steps. Whereby Acuvate starting AI-ML model over time to get smarter.

Multiple choices (email / dashboard / digital twin / Gen AI / etc.) possible to inform decision makers, whereby Gen-AI can be used to give better clarification messages and the steps to take to get problem fixed.

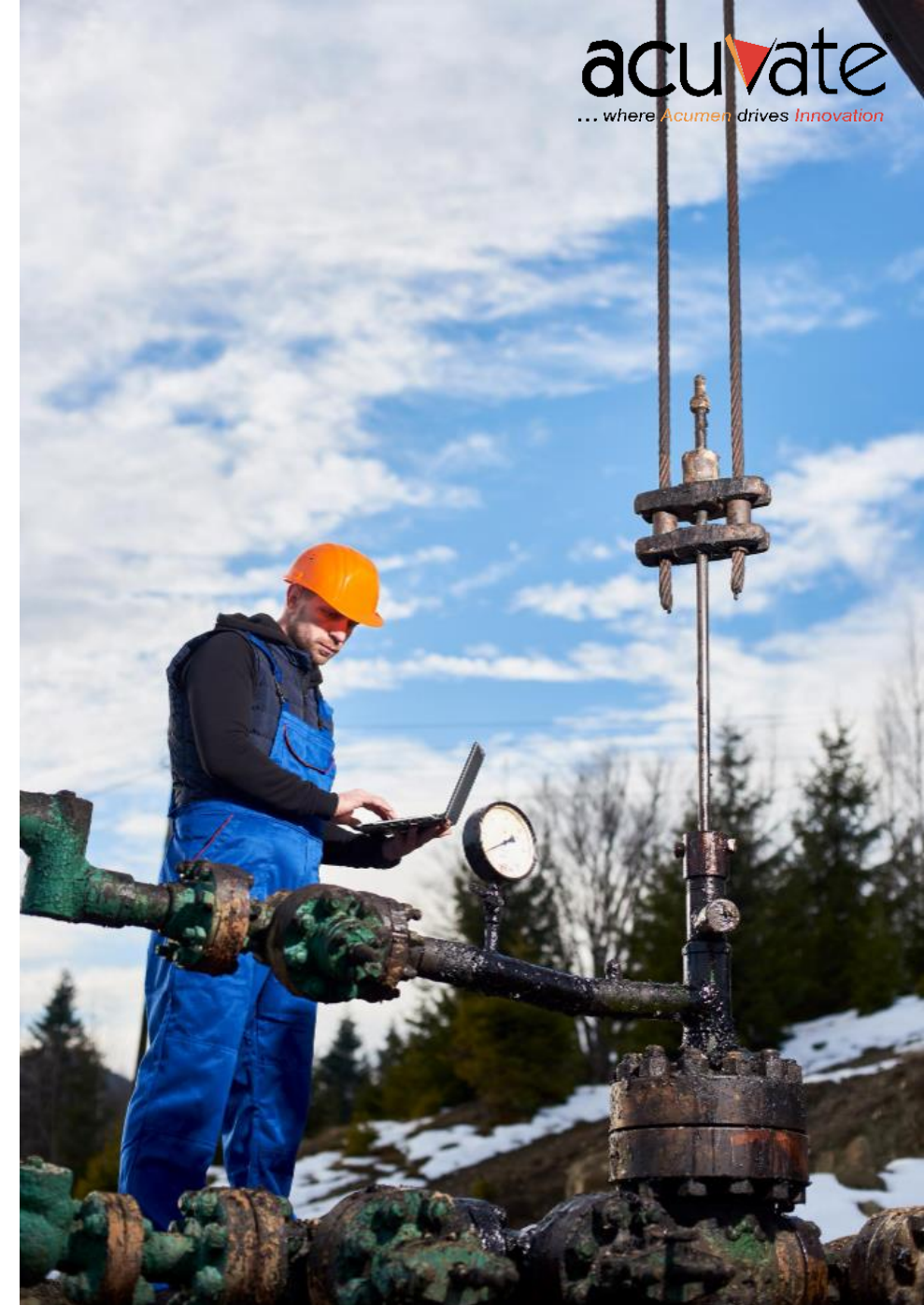
Ongoing (SLA) Operational support available

Ease of use implementation Indicator (1-5): 5  
(1 = difficult and 5 = easy)



# Acuvate solution: Predictive Maintenance for critical business processes

- Leads to better OEE → Higher Yield (Production).
- Develop & Train AI – Machine Learning model based on:
  - PI Timeseries from critical (rotating) eqp such as: Engines, Turbines, Compressors, etc.
  - Maintenance records from SAP / Maximo / etc. about maintenance information.
  - Both data sources to be aligned.
- It takes time & effort to train the model such that success rate is high enough (low false positives).
- Result: Getting information about potential failing components days in advance: Time to take an maintenance action.
- One of the most effective approaches to leveraging AI is fine-tuning pre-trained models for specific use cases. This technique allows companies to adapt existing high-performing models to their unique domain requirements, saving time and resources while achieving better results.



# Acuvate solution: HSSE: PPE / Zone protection / Emissions / Smoke detection



## When deployed

There is a broad spectrum of HSSE related services. In most cases it is based on Camera (including CCTV cameras) images or other data sources (sniffers for emission measurements). AI-MV and AI-ML to be used to analyze the data and to tell Operations what actions to take and where needed action (autonomous is possible).



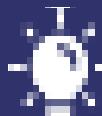
## Business value

Early spotting of potential HSSE issues before they can cause harm to staff → Staff experience a better & safer working environment.

Use Acuvate Edge Platform to ensure immed response to HSSE issues.



## Usage cases



## Hints & Tips

### Verticals : Energy & Manufacturing.

Define critical HSSE issues for your production set up + based on that we define the services we need to prevent these HSSE issues.

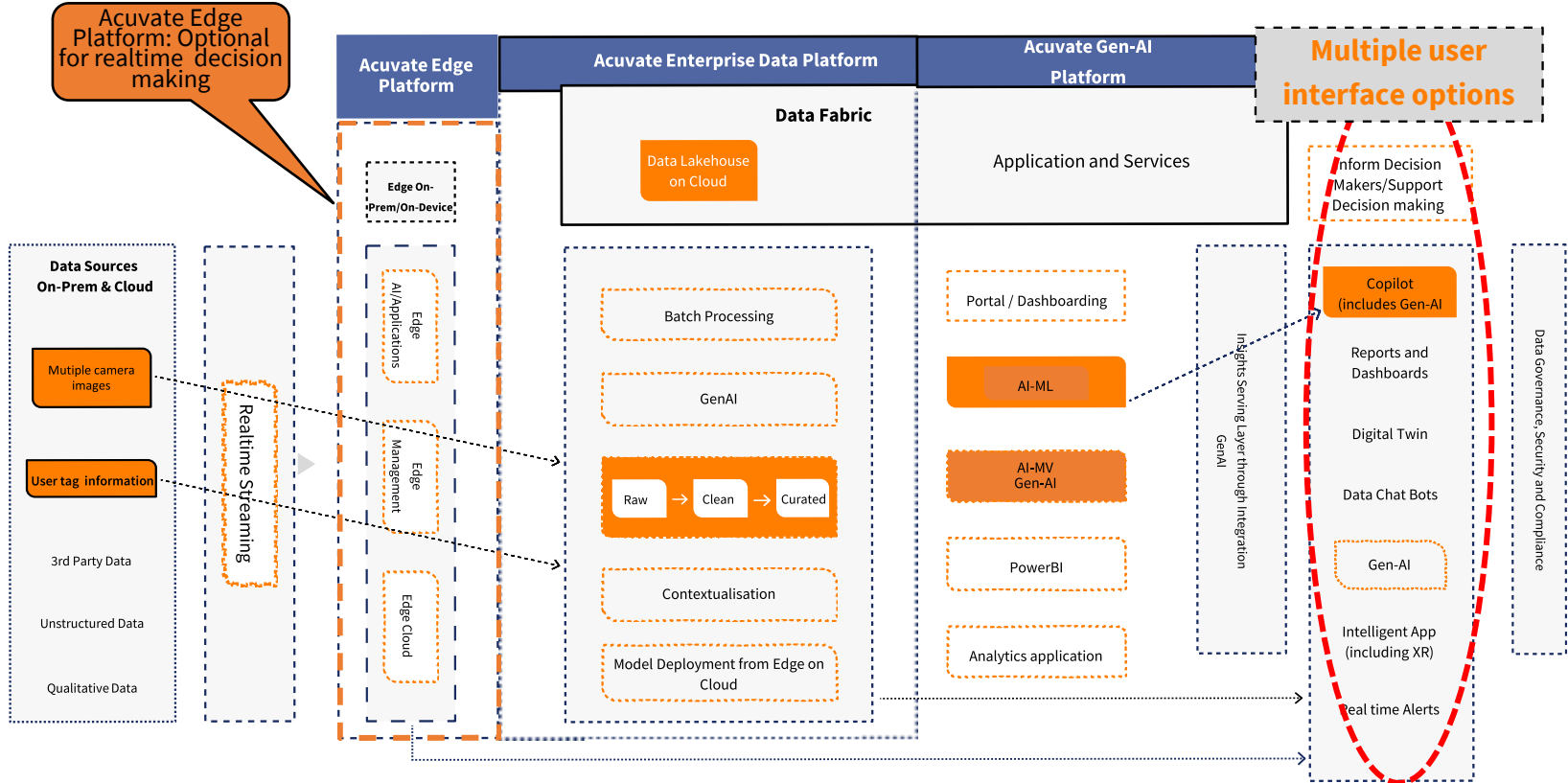
Most data will be Camera images and we need AI-MV to validate all images and take action where needed. However for emissions, etc. we might need as well AI-ML to measure current and expected levels. In both cases also Gen-AI can play a role.

Only when there are reported issues we inform Operations which can be done in multiple ways all dependent on customer set up.

(5G) Cameras and other sensors (sniffers) can have fixed location / on Robots / on Drones.

Ongoing (SLA) Operational support available

Ease of use implementation Indicator (1-5): 3  
(1 = difficult and 5 = easy)





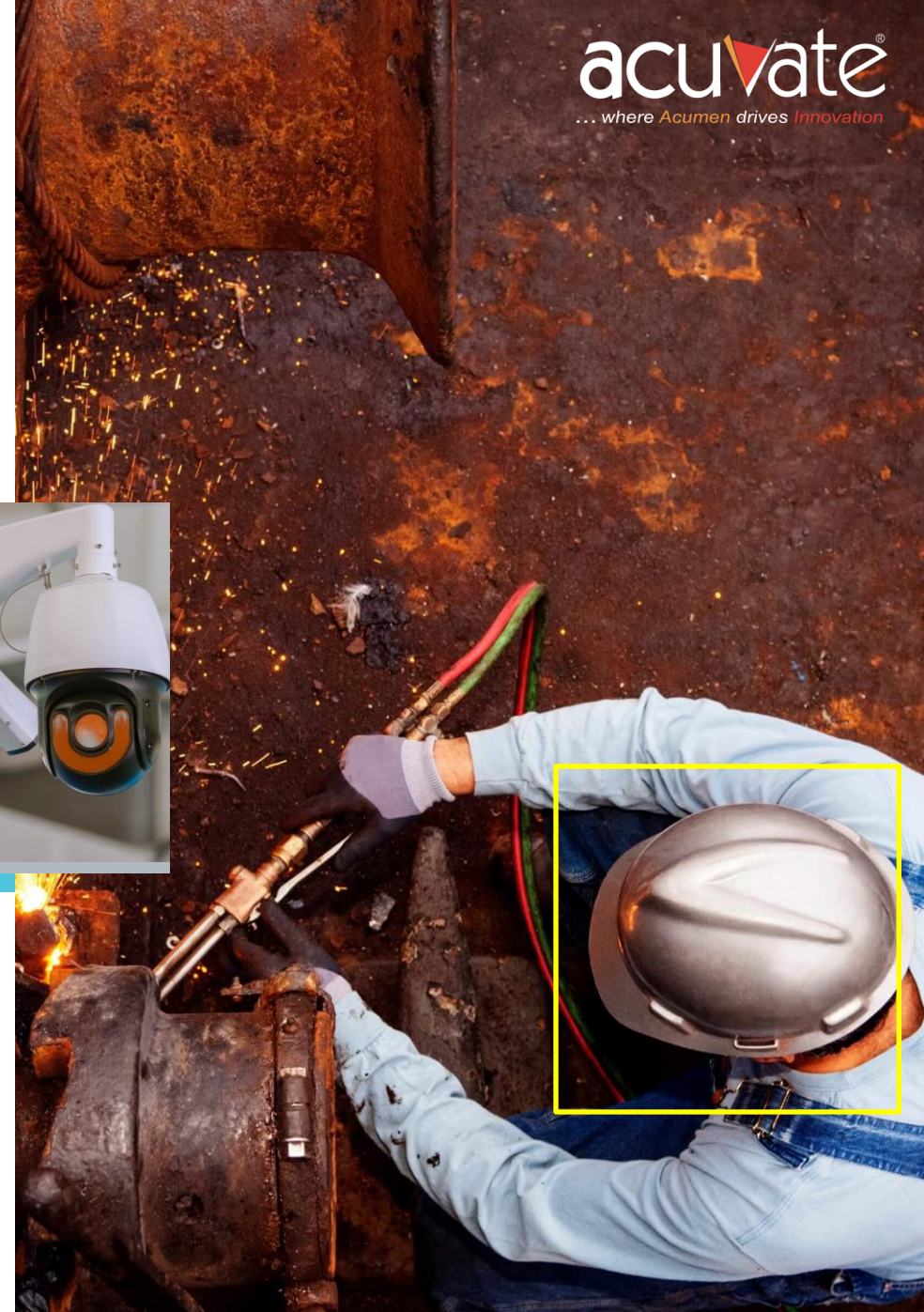
# Our Offering

Acuvate's AI-Powered HSSE (Health, Safety, Security, and Environment) Solutions employ advanced AI-Machine Vision (AI-MV) and AI-Machine Learning (AI-ML) and Edge Computing technologies to analyse data from cameras and other sources, identifying potential safety hazards in real-time.

The solution enables proactive safety measures such as

- PPE monitoring
- Zone protection
- Prevention of unsafe practices around hazardous operations.

With AI-MV acting immediately on these insights, often without manual intervention, we ensure that potential risks are mitigated before they can pose a threat to staff. This early detection and intervention system enhances overall workplace safety and staff well-being, crucial for maintaining high productivity and compliance with safety standards.



## Our Offering – Going for an incremental approach

It is possible to start very small and grow over time to more complete solutions. Starting small could mean that we use existing sensors (CCTV cameras) for collecting data and we add some Cloud based compute capacity to analyze the data using AI-Machine Vision to look for defined HSSE (PPE) breaches.

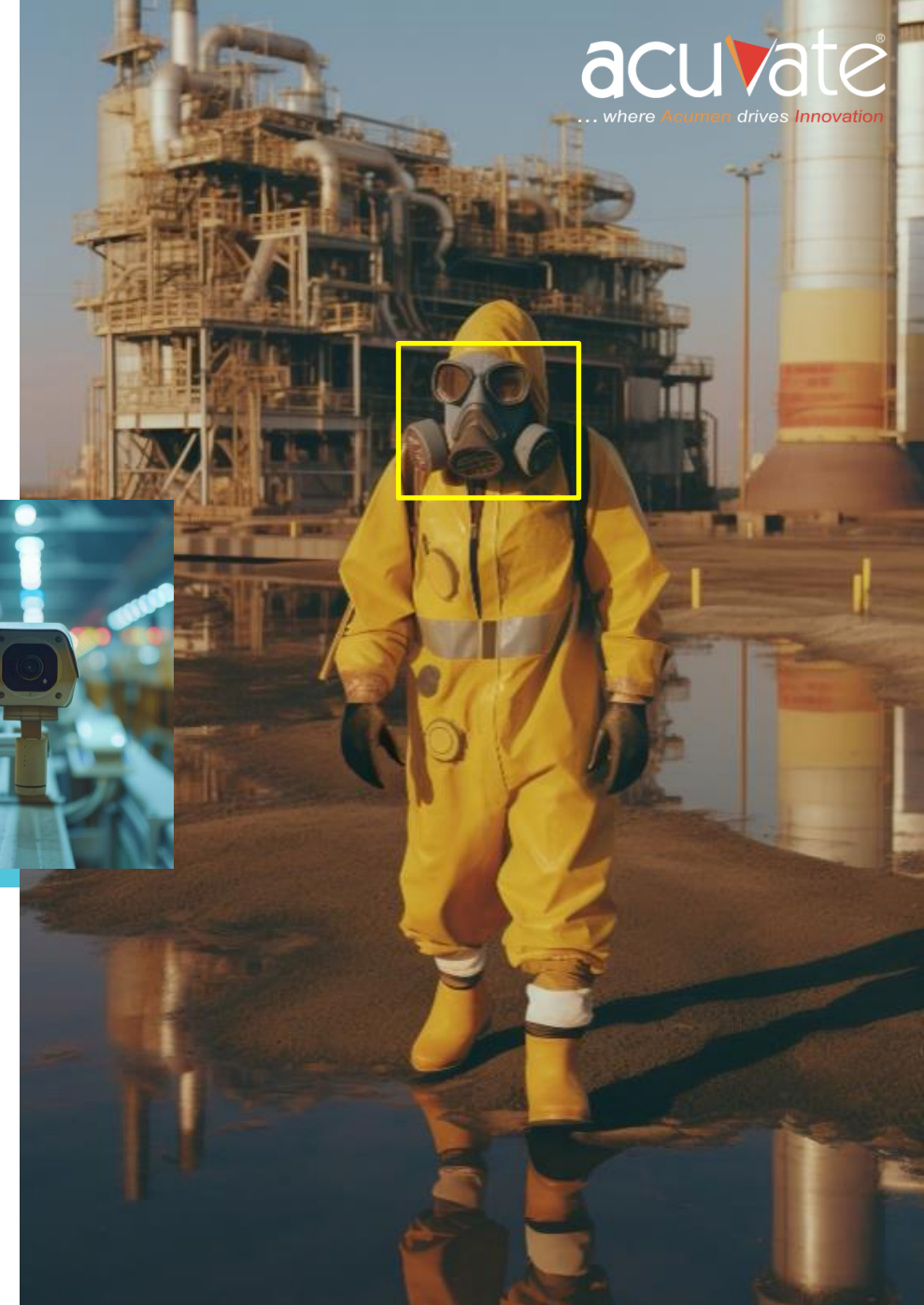
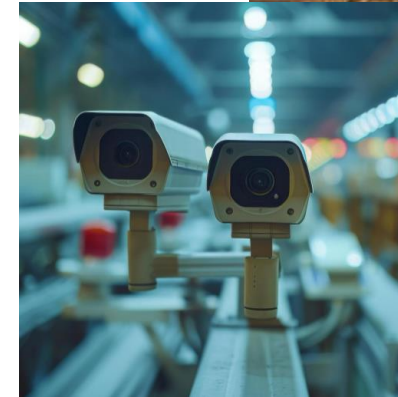
Alarming staff about breaches could be done using existing personal tags.

Investment for above approach:

Storing CCTV camera images in an Acuvate Enterprise Data Platform or similar existing company storage → Very likely already done at this moment.

Developing & Training the AI – Machine Vision model based on the HSSE scenarios to look for.

Make available MS Azure (or other cloud) to regular run the AI-MV models.





# Use Case (1): Zone Protection: Detect people in High-Risk Areas

## Dynamic No-Go Zones

- Define and update no-go zones in real-time.
- Applicable across any area of the facility.

## Reasons for No-Go Zones

- Slippery floors.
- Leakages.
- Planned maintenance work.
- Other safety or operational concerns.

## Personal Tags for Staff

- Staff carry personal tags capable of sending and receiving messages.
- Tags can send location information and receive warning messages. Example: Apple Watch.
- Intrinsically safe devices are also available for use in hazardous environments.

## Alarm System

- Alarms trigger on personal tags if staff enter no-go zones.
- Ensures immediate notification and responses.



# Acuvate solution: More efficient Operations with Gen-AI driven end to end approach



## When deployed

By using various AI technologies (Gen-AI as the overall interface) making it possible to better predict and inform Operations about upcoming asset failures; Give advice to Operations & Maintenance about potential causes of these failures; Supporting Maintenance / Engineering staff how to fix this and making sure that all related doc is updated

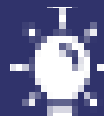


## Business value

Predicting potential failures, identifying detailed cause and assistance to fix it; All resulting in less downtime (more production) and, as well important, better usage of scarce staff resources.



## Usage cases



## Hints & Tips

**Verticals :** Energy & Manufacturing.

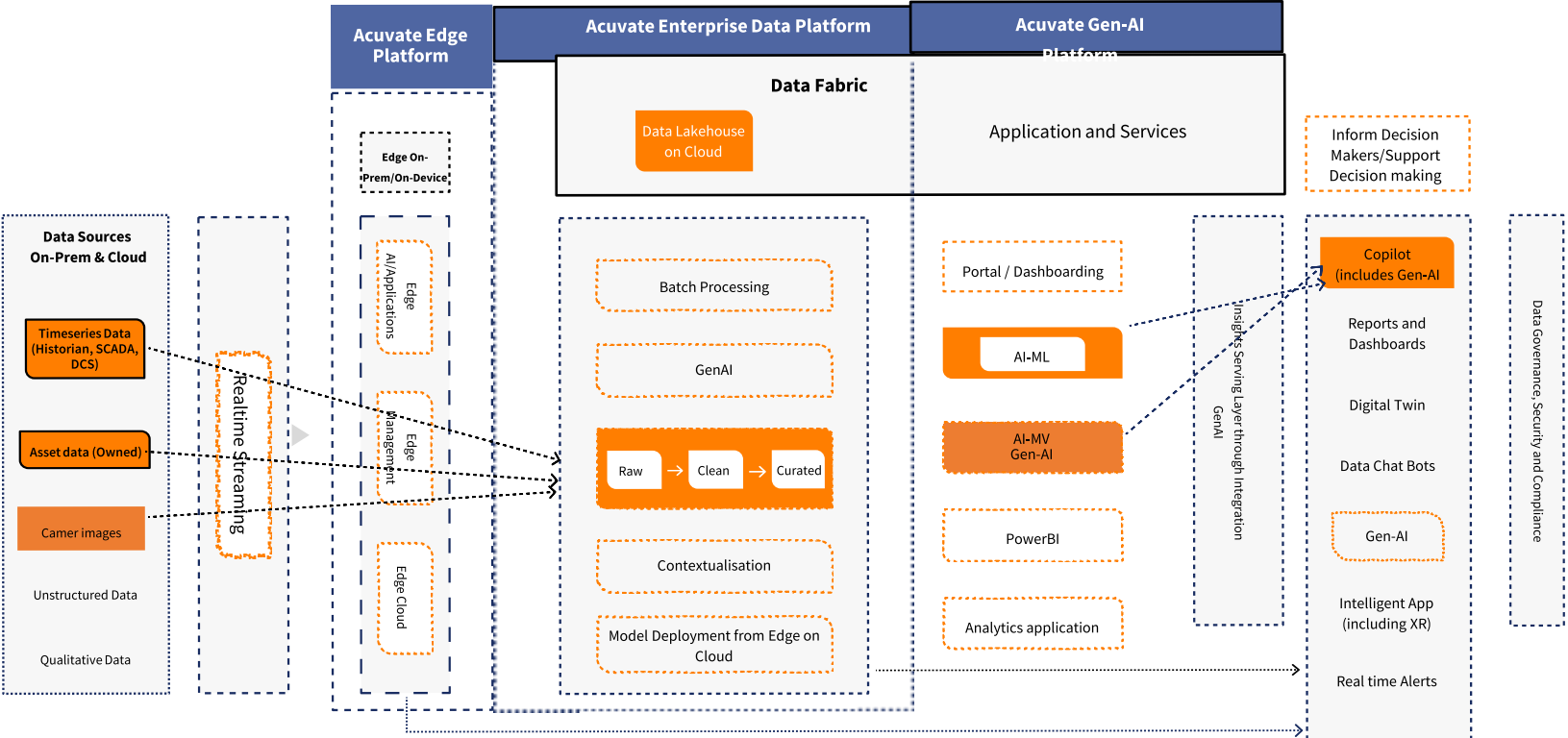
Provide end to end Gen-AI driven process: Going from informing Operations lead about critical problems to telling him how to address and who (on the shop floor) to get involved to solve the problem.

Various AI approaches will be used + various tooling such as ERP, etc. but all access via single GEN-AI based user interface.

Any operational end to end business process can be selected and fully automated using Gen-AI as the end to end interface including front ending ERP apps such as SAP and Maximo.

Video available

Ease of use implementation Indicator (1-5): 5  
(1 = difficult and 5 = easy)

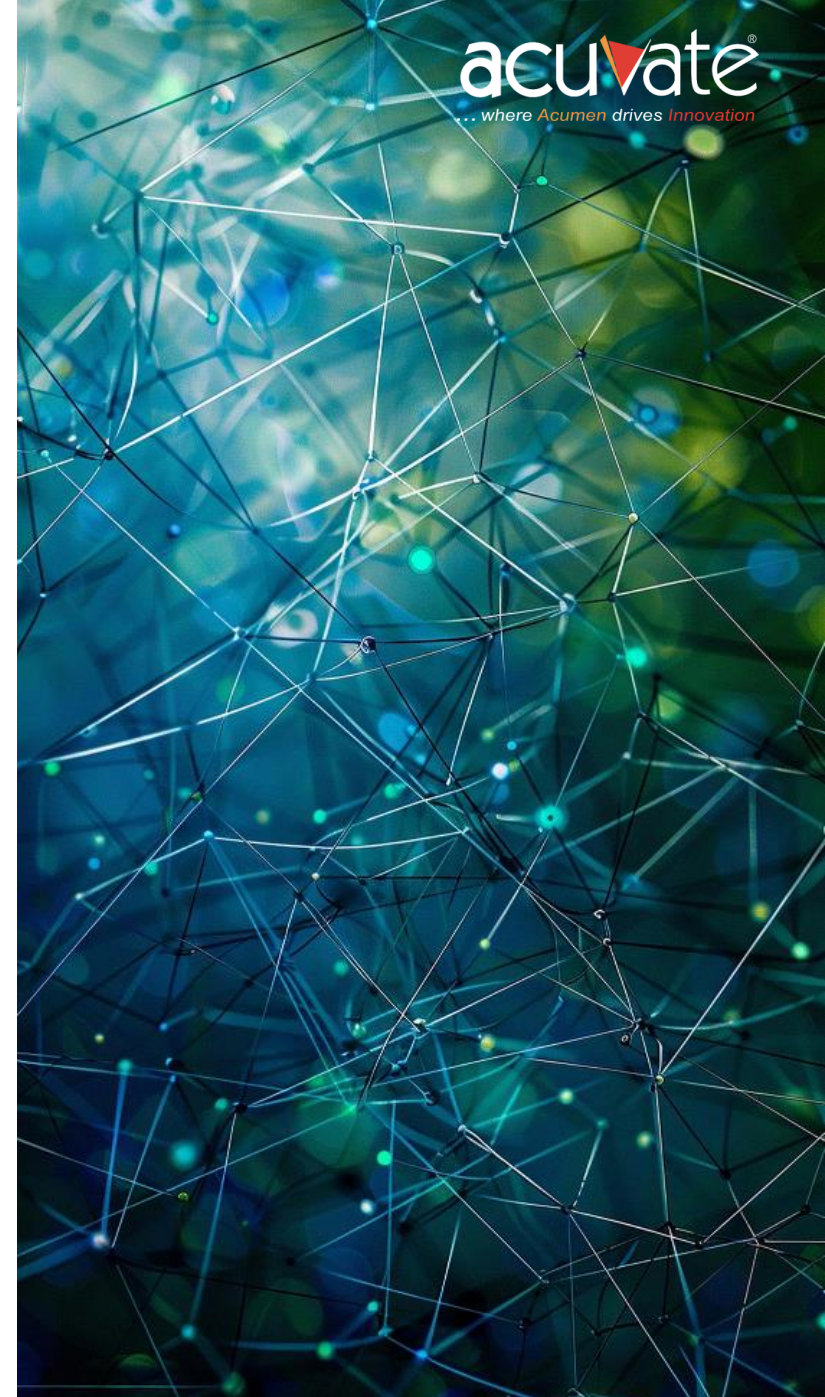




# Acuvate solution: Gen-AI driven end to end Operations

- **Using Gen-AI as the sole interface for Operations:**

- Getting the overview of outstanding problems by priority.
- Getting information from SAP / Maximo about the failing eqp without the need to access these tools.
- Getting information about potential causes and as well the most likely cause by accessing all relevant data in an integrated fashion: Operator logs; Time series data; ERP data; Production numbers; etc. Again using the same Gen-AI interface.
- Getting information on how to fix the problem using videos / integrated Realwear headset / technical instructions: Again using the same Gen-AI interface.
- Very low threshold (effort in some weeks) to introduce and can be done in a phased approach with immed business value.
- Gen-AI (realtime) supports a voice interface (many languages) and written interface.



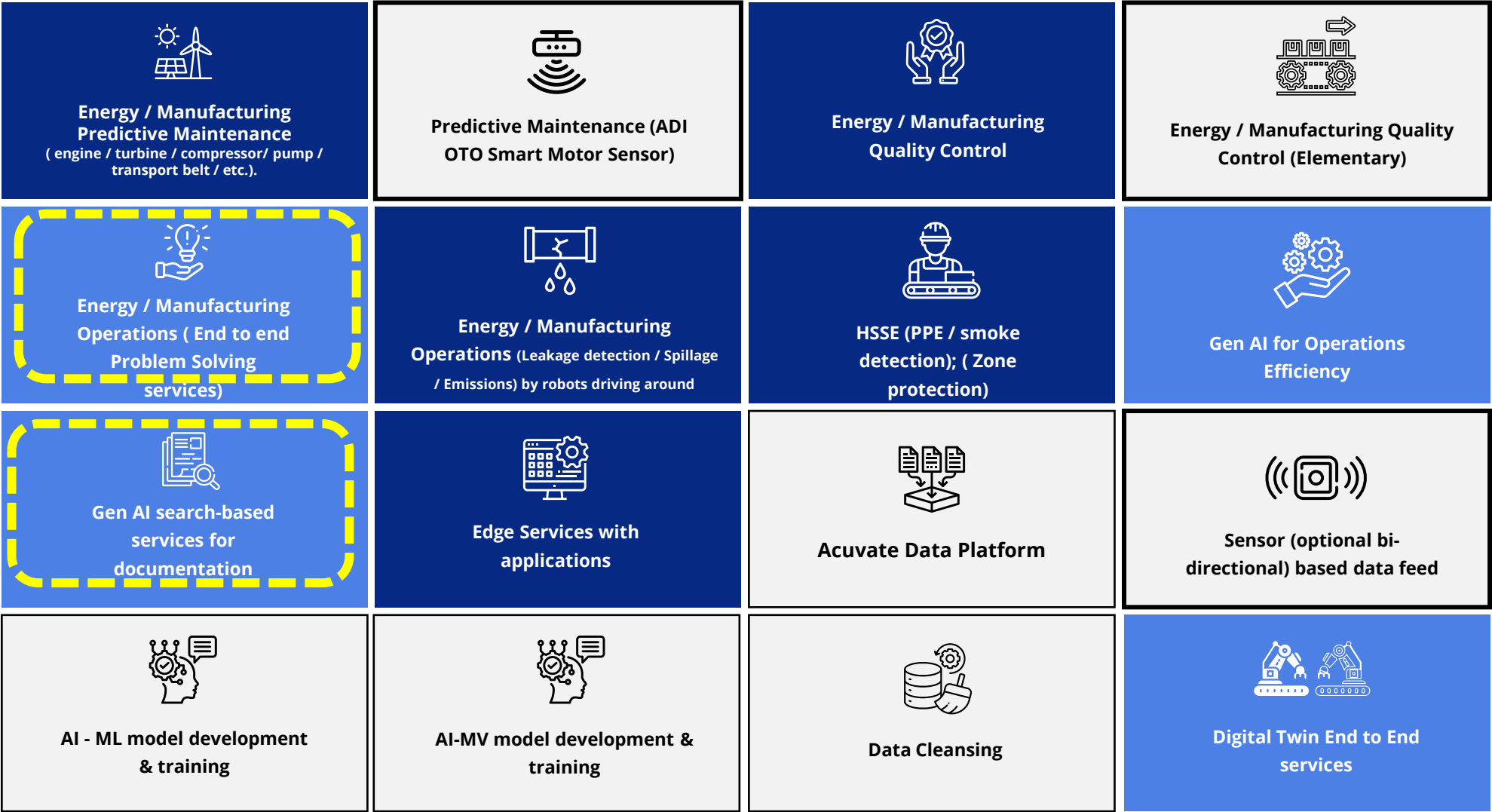
# Acuvate Business Services Overview - For more detail for each service see next slides

U I	AI	(Co-Pilot) Digital Twins / PowerBI (reporting) / XR (3D)		
	AI	Gen-AI user interface: (Search) Documentation – Structured data - Tables		
	AI	Edge	Energy Mgt: Utilities / Optimize	
	AI	Edge	Customer / Thirdparty Business Applications	
	AI	Edge	Optimized Production Line settings	Man
	AI		Overall Equipment Effectiveness (OEE)	Man
	AI	Edge	HSSE: PPE / Zone protection / Emission leakages / Smoke detection	
	AI	Edge	(real time) Quality Control Elementary (products: Very high success rate)	Man
	AI	Edge	real time) Quality Control (products: Plastics / lubricants / chemicals)	Man
	AI	Operations: E2E from Pred. Maintenance to Maintenance Staff fixing the problem		
B a s e	AI	(drones / robots) Operations: Leakage Detection / Spillage / Emissions		
	AI	Predictive Maintenance (ADI Smart Motor Sensor): For Three Phase Induction & Magnetic eng.		
	AI	Predictive Maintenance: For pumps / engines / turbines / compressors / valves / etc.		
	AI	Acuvate AI – Machine Learning / AI – Machine Vision: Development – Training – Running (device itself / edge / enterprise data platform)		
	Governance / Cleansing / Master data		Acuvate Data Platform	Acuvate Edge Platform
	Acuvate 7 steps standard Digital framework			
	IT & OT (data sources)		Sensors	(Cloud: MS Azure & On Premise)

Also New Energy solutions

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# Acuvate's Business Services for Industry (Energy & Manufacturing)



**Gen-AI enabled**



**Gen-AI enriched**



**Demo**

## Streamlining Geoscience Knowledge Capture with AI-Assisted Documentation

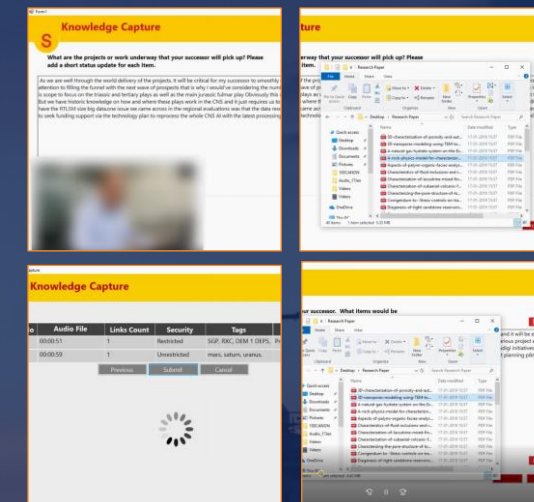
- Acuvate's Knowledge Capture Assistant revolutionizes how geoscientists manage their wealth of data and insights. By employing advanced Conversational AI, the system captures and converts spoken expertise into a structured knowledge base, reducing the manual effort traditionally involved in data documentation.
- It enables real-time voice and text entry, integrates with existing digital knowledge systems, and employs a custom speech and voice model tailored for geological terminology.
- This innovative solution ensures that critical geological information is easily stored, tagged, searchable, and accessible, paving the way for efficient knowledge transfer and continuity within research organizations.

[Read the full case study](#)

## UK's Leading Waste Management Company Implements Machine Learning for Enhanced Driver Safety and Reduced Insurance Costs

- The waste management company has integrated a machine learning solution to analyze telematics and tachograph data for its fleet of 1300 drivers to predict and prevent driving incidents.
- By forecasting potential accidents and identifying high-risk drivers, the company can focus on targeted training, thereby improving overall driver safety. This proactive approach has led to a decrease in accidents, enhanced driver safety, and a reduction in insurance payouts.
- Future plans include integrating weather data for more refined predictions.

[Read the full case study](#)



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Visit our company site [www.acuvate.com](http://www.acuvate.com) for all information



# Objectives for today

1



Digital  
Transformation :  
way forward

2



Getting data from field to  
Ops center :  
Demonstrations

3



"low hanging fruits"  
for quick value  
realization

4



Demonstration of  
GenAI providing  
value to Oil & Gas  
Energy.

5



How Acuvate &  
Partners can help in  
a practical way.

6



Did we meet these  
objectives?

# Closing session



All presentations & recordings will be made available, and you will get the link in the coming days.



Many thanks to **all partners** presenting and demoing today.



Be aware we now have drinks available.



Many thanks to **Microsoft** for the cooperation and accommodation.



Your attendance has been appreciated and in case you would like to do a follow up then contact at [advisors@acuvate.com](mailto:advisors@acuvate.com)



Any feedback you have.



# 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: [advisors@acuvate.com](mailto:advisors@acuvate.com)**



# THANK YOU

**acuvate**<sup>®</sup>  
... where Acumen drives Innovation