

# AI@work – Transforming Industry

AI applications to drive productivity, sustainability, quality and safety. Enterprise AI and Industrial IoT platform driving digital transformation.

November 2021

Confidential



# Purpose – Creating the future of industry

Industry.AI is an Enterprise AI and Industrial IoT company driving digital transformation

The AI applications use Industry.AI's intelligent **EDGE** software, and its proprietary “**Orion**” platform – the operating system for AI and IoT. By digitizing industries, and applying big data analytics we work with customers and partners to.....

1. Increase **Productivity** and **Reliability** – OEE, machine availability, cycle time, asset health, predictive maintenance, employee's
2. Reduce **Costs** and increase **Energy Efficiency**
3. Improve **Quality, Safety & Sustainability**

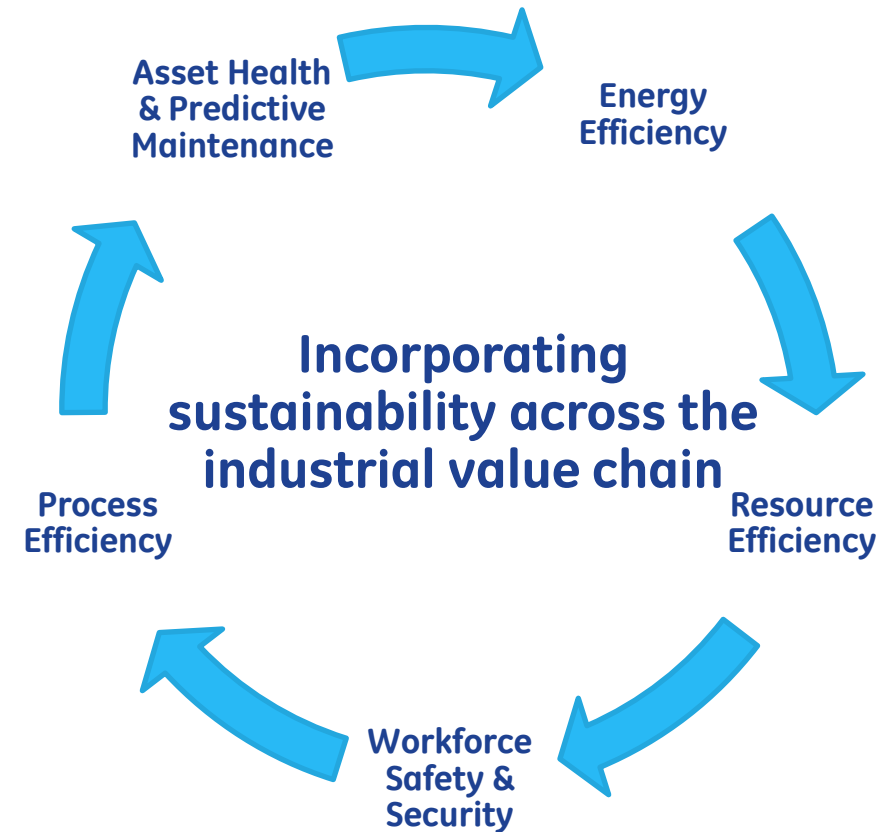
# Solving the Sustainability challenge with AI & IoT

Sustainable manufacturing – creating a world of manufacturing with no waste



1. International Society of Automation 2. World Economic Forum

## Leveraging AI and Big Data to drive sustainability



# Sectors we work with

Wide domain expertise across industries



Renewables



Transportation



Ports & Shipping



Oil & Gas



Manufacturing



FMCG



Aviation



Steel



Automotive



Real Estate

# Products - Enterprise scale AI applications

Industrial AI and IoT platform driving digital transformation and productivity



**Predict.AI** - Asset Health & machine performance – wind turbines & solar farms



**Track.AI** - Supply Chain Optimization and performance monitoring – Train, Trucks, Container



**Conserve.AI** - Smart Buildings – Healthy Buildings - Increasing the value of buildings



**Smart Factory** – Reliability & Predictive maintenance



**Port.AI** - Smart Port – cranes to containers



**Spot.AI** - Asset Tracking, Inventory Management, & Workforce management – Factories, Warehouse, Buildings



**Conserve.AI** - Energy Efficiency & Sustainability - Factories & Buildings



**Trust.AI** - Visual Analytics – Quality, defect detection, Safety, Security

# The core technology suite includes....



Analytics.AI -- AI/ML algorithms to provide insights



IoT.AI -- Digitalisation - IIoT & Data Collection



Big Data.AI – data management



Track.AI -- Resource/ Asset Tracking & Tracing



Trust.AI -- Video Analytics & Image Processing



Electrical.AI - Electrical Drives – Predictive Intelligence

# Technology - Vision



Full-stack Orion platform for real-time connectivity, intelligence, and automation.



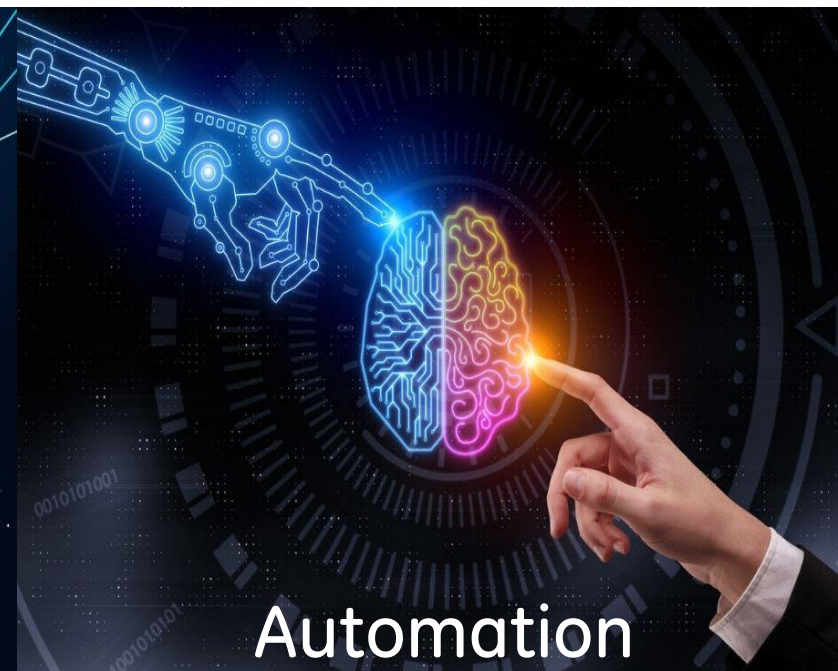
## Connectivity

Connect people, things &  
Processes (IoT) – Collect the  
Data –  
Aggregate



## Deep Learning/AI

Real Time Intelligence (AI) –  
Develop AI Models –  
Analyze



## Automation

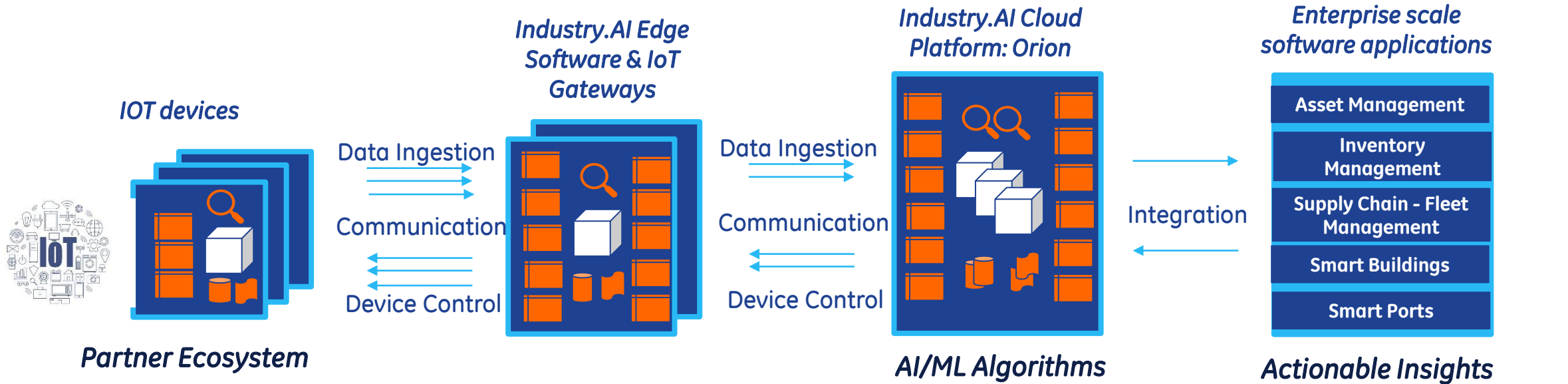
Automate processes –  
Deploy AI Models –  
Act

# Industry.AI provides end to end solutions..IoT to insights

Product + Service capabilities. "Orion" – operating platform for IoT and AI



## BLP Industry.AI



BLP Industry.AI audits, does the engineering & architecture design, and installs 3<sup>rd</sup> party IoT devices in factories/buildings/assets.

Proprietary Edge software connects all IoT protocols. BLP works with a number of 3<sup>rd</sup> party gateway suppliers.

"Orion" – BLP Industry.AI's proprietary industrial digital platform for IoT and AI. Cloud agnostic – Google, AWS, Azure

Enterprise scale AI software products customized for a number of industries.





# Architecture

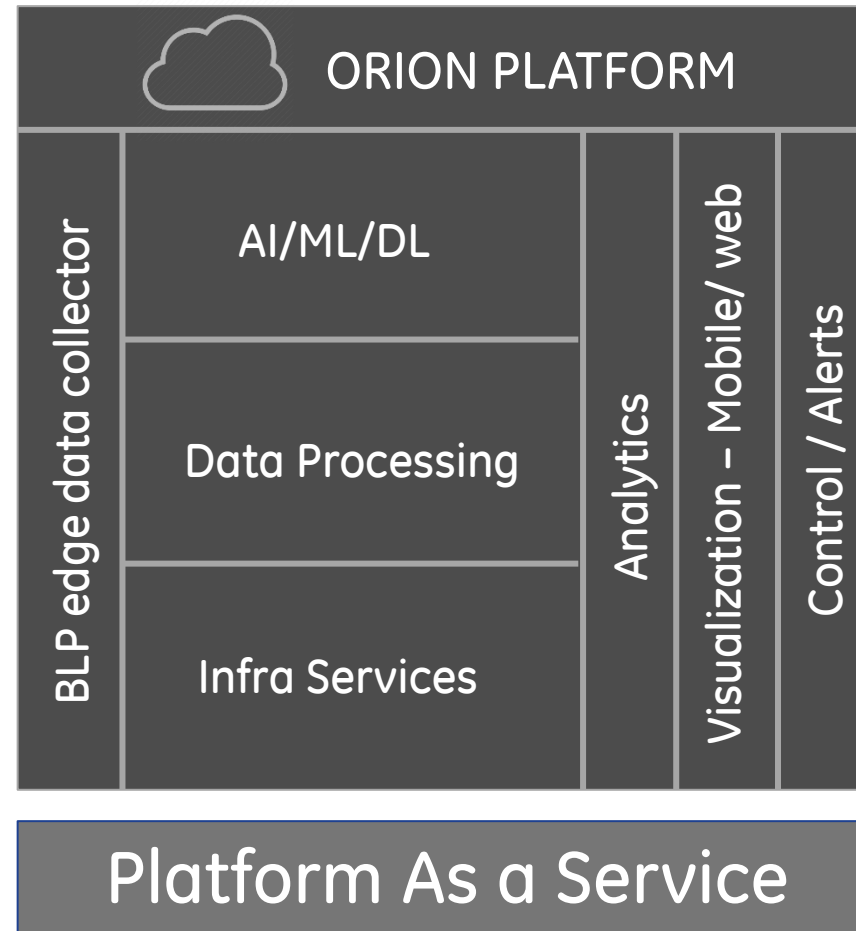


An integrated solution – from data input to insights. Detect, Improve, Automate



## Data Sources

- Maintenance Data/Failure Data
- Enterprise systems
- Zone and Territory level Sales Data
- Store Info and Credit History
- Sensors/SCADA/PLC – Vibration, Temperature, Flow etc
- Weather data
- Camera/CCTV



## Applications



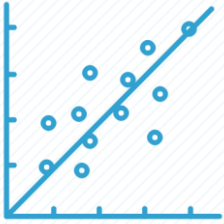
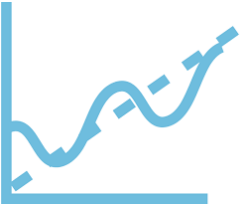
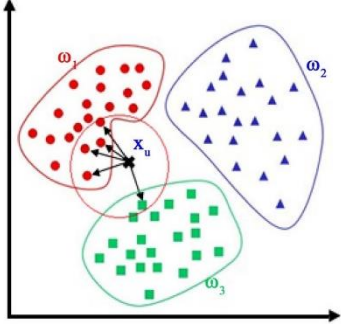

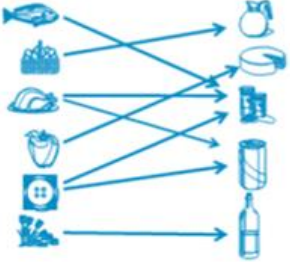
1. Sales forecast & Planning
2. Predictive Maintenance
3. Asset Performance

Application- Core AI – Orion Platform - Industrial Digital Platform - Providing industrial intelligence to improve productivity and quality



# AI/ML Techniques in Action

Following are typical algorithms being used for developing various solutions

<b>Tree Based / Ensemble</b>	CART ID3 <b>Random Forest</b> <b>Bagging</b> <b>Boosting</b> AdaBoost C4.5 / C5.0 <b>CHAID</b> Decision Stump / M5 Weighted Average (Blending) Stacking <b>GBM</b> GBRT 	<b>Classification</b>	AODE <b>BBN</b> BN <b>LARS</b> <b>Naïve Bayes</b> Gaussian Naïve Bayes Multinomial Naïve Bayes 	<b>Regression</b>	<b>Logistic Regression</b> <b>Linear Regression</b> Ridge Regression <b>LASSO</b> <b>Elastic Net</b> LARS 
<b>Time-Series</b>	ARMA <b>ARIMA</b> SARIMA <b>SARIMAX</b> Holt Winters 	<b>Clustering</b>	<b>k-means</b> <b>kNN</b> EM <b>LVQ</b> SOM <b>Ranking SVM</b> one class SVM Hierarchical Clustering Locally Weighted Learning <b>Affinity propagation</b> 	<b>Neural Nets</b>	<b>LSTM</b> <b>MLP</b> <b>Back Propagation</b> Hopfield Network <b>RBFN</b> <b>Stochastic Gradient Descent</b> 
			<b>ARM</b>	<b>Collaborative-Filtering (CF)</b> <b>Apriori Algorithm</b> ECLAT 	

# AI/ML Capabilities

Over 80 algorithms developed over 6 years for more than 20 Industrial segments

Industries	Wind Energy	
	Solar Energy	
	Oil & Gas	
	Chemicals	
	Tire	
	Glass	
	Steel	
	Aluminum	
	Cement	
	Refractories	
	Thermal Power Plants	
	Automotive Spare Parts	
	Aviation	
	Supply Chain Management	
	Transportation (Rail/Road)	
	Shipping	
	Ports	
	Electrical Goods & Appliances	
	FMCG	
	Sugar	
Ceramic Tile		
Commercial Buildings		



## Failure Prediction

Predicting failures in advance with the help of advanced AI model trained & tested on historical data and validated on live data



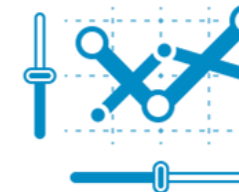
## Anomaly Detection

Identification of deviations far away from the normal behavior and suggesting the impact and risk exposure



## Recommendations

A prescriptive approach to suggest actionable insights for implementation on the field by frontline resources



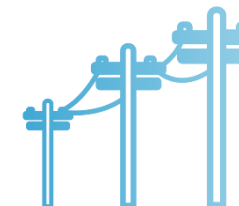
## Dynamic Threshold

A tailored approach to address highly sensitive specialized issues based on the current level of operations given the historical exposure and behavior



## Asset Health Prediction & Diagnostic

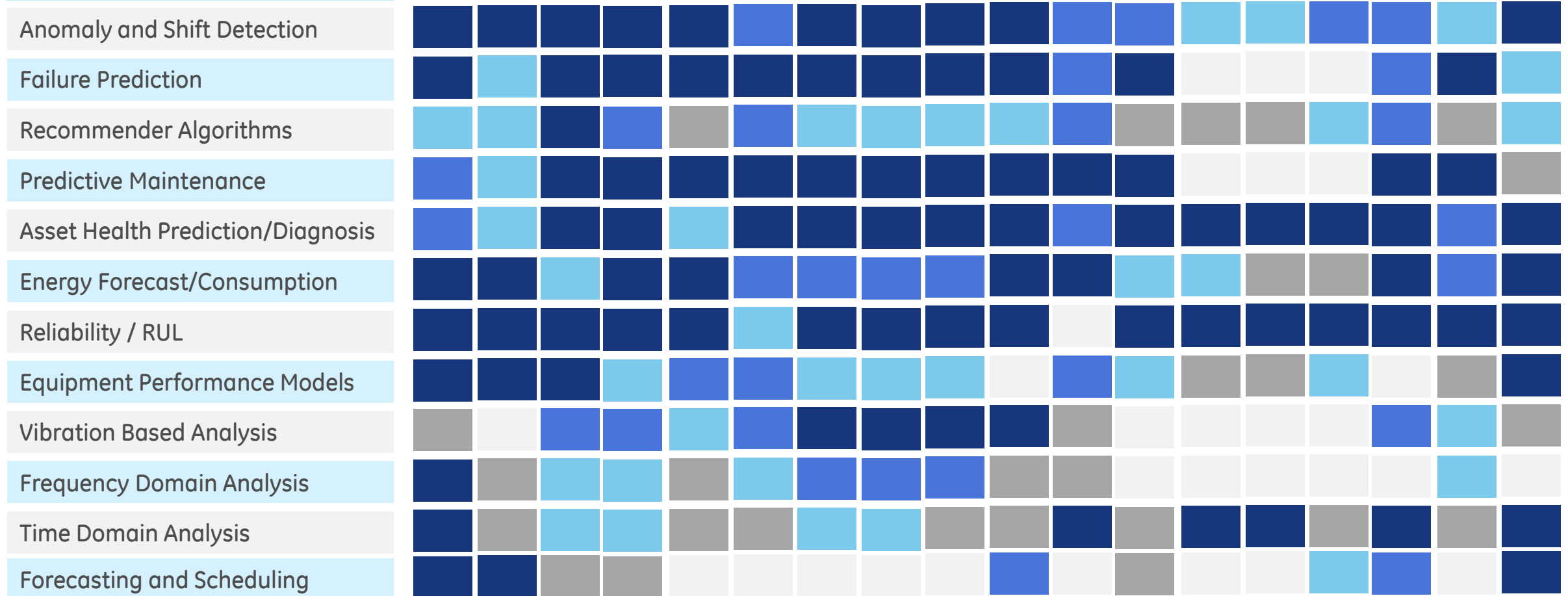
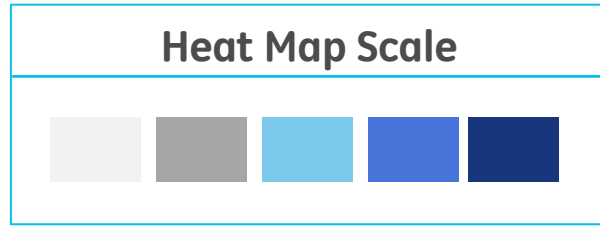
Learning from the past events and historical behavior and predicting the reliability of the equipment / entire process



## Energy Analytics

Applying deep knowledge of domain and data science to address challenging issues causing high specific energy consumption

# Industry.AI algorithms & applications



# Application – Conserve.AI – Smart Buildings – Energy Efficiency – Sustainability



# Conserve.AI – Connected Buildings

IoT is driving efficiency and sustainability


# of Connected devices - Buildings



**By 2020: >30% connected devices in every building**

-  Desks
-  Trash Cans
-  Lighting
-  Occupancy

# End to End digitization solving modern problems



**30%** Possible Reduction in engineering

## Standardization

Standardization, reusability, and mobile technology mean less effort in engineering and deployment



**82%** Untapped Potential in Energy Efficiency

## Energy Efficiency

Buildings have the highest untapped energy efficiency potential by sector



**20%** Energy Savings Per Year

## Connected IOT

Predictive maintenance enabled by IoT and artificial intelligence



**11%** Increase in customer experience

## Customer Experience

A more personalized, comfortable experience drives productivity



# Digitization drives Sustainability

## Benefits



01

Measure

- Need connectivity of all key equipment regardless of manufacturer. Install additional IoT devices if required

02

Transparency

- Provides insights into the building and factory operations

03

Traceability

- Identify areas for savings

04

Connect people to the building

- Mobile and connectivity provides greater cohesion

# Conserve.AI - Key Philosophy

Single unified portal across all properties. Open and scalable. Integrates with 3<sup>rd</sup> party equipment and software



Improved Building  
Performance -  
Reduce Costs -  
Energy,  
maintenance  
security



Minimum upfront  
Investment,  
Capex to Opex



Carbon Footprint  
Reduction



Increased Value and  
Customer Experience -  
Air Quality

# Smart “Healthy” Buildings - Sustainability



Collaborating HVAC Maintenance strategies & technology to reduce the spread of virus

Improve air quality using HVAC Maintenance Strategies

Real Time updates on space utilization and critical events including covid 19 updates

Using RTLS to monitor office occupancy for Density and social distancing

Temperature screening of occupants using thermal cameras

Vehicle/shipment tracking using IOT Devices

Real Time Updates

Covid 19 Response - Solutions

Manage Energy Performance & Air Quality

Safety & Security

Using IOT sensors to build a targeted sanitation & surface disinfection strategy

Face mask detection by leveraging visual analytics models

Implement Energy Efficiency strategies to improve performance by off-setting new HVAC guidelines

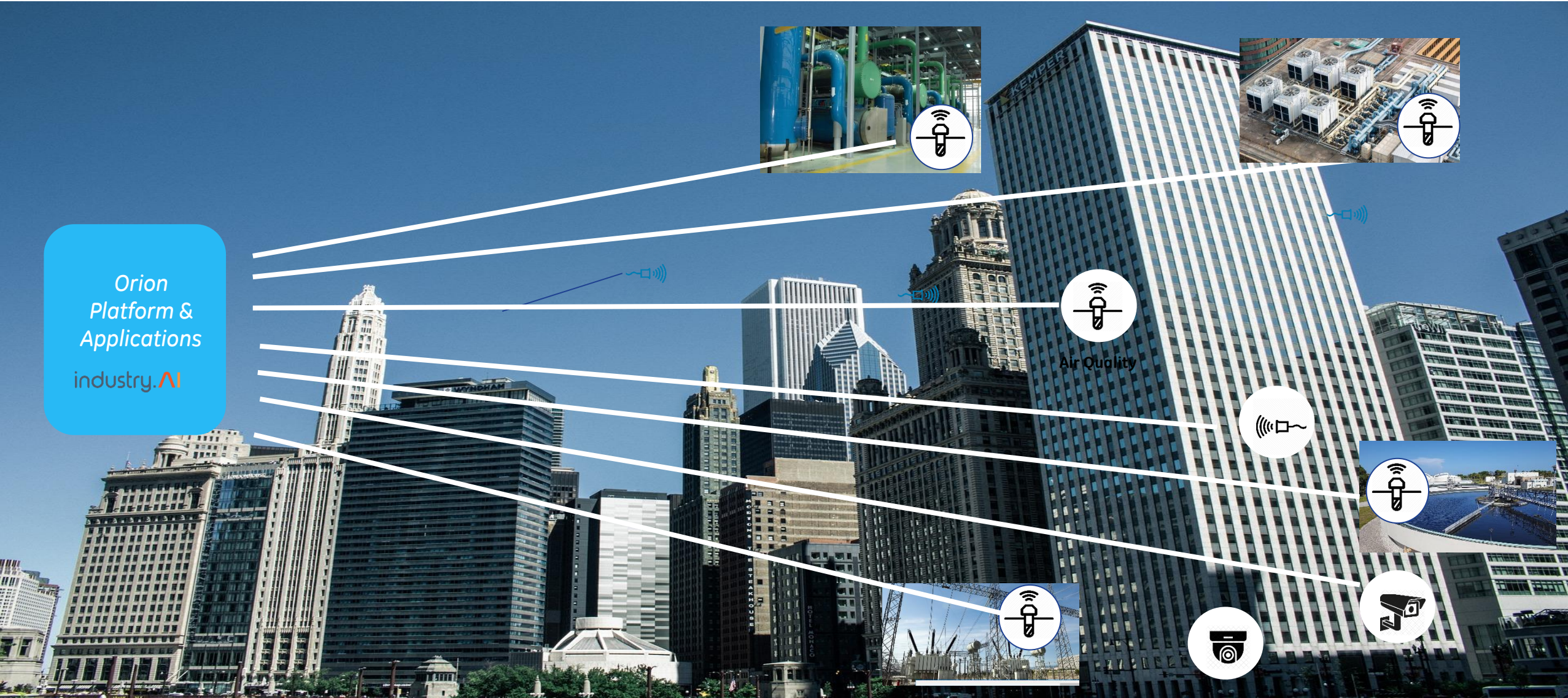
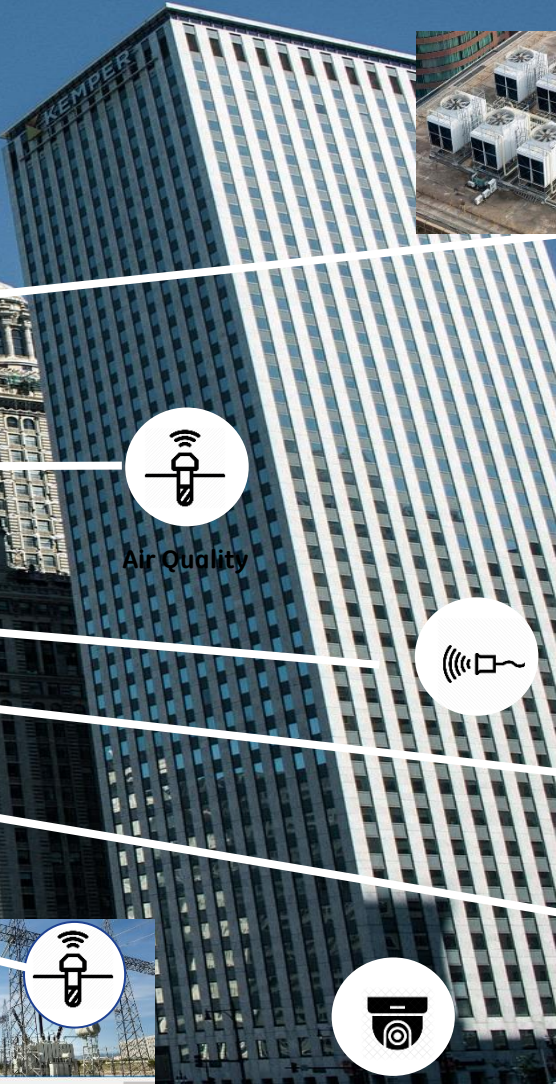
Contract tracing using US PRO Mobile Application

# Conserve.AI - Integrating all operational parameters of a building onto one platform – energy, water, waste, fire, security, DG, air quality, etc



Using AI and IoT to improve operational efficiency and transparency

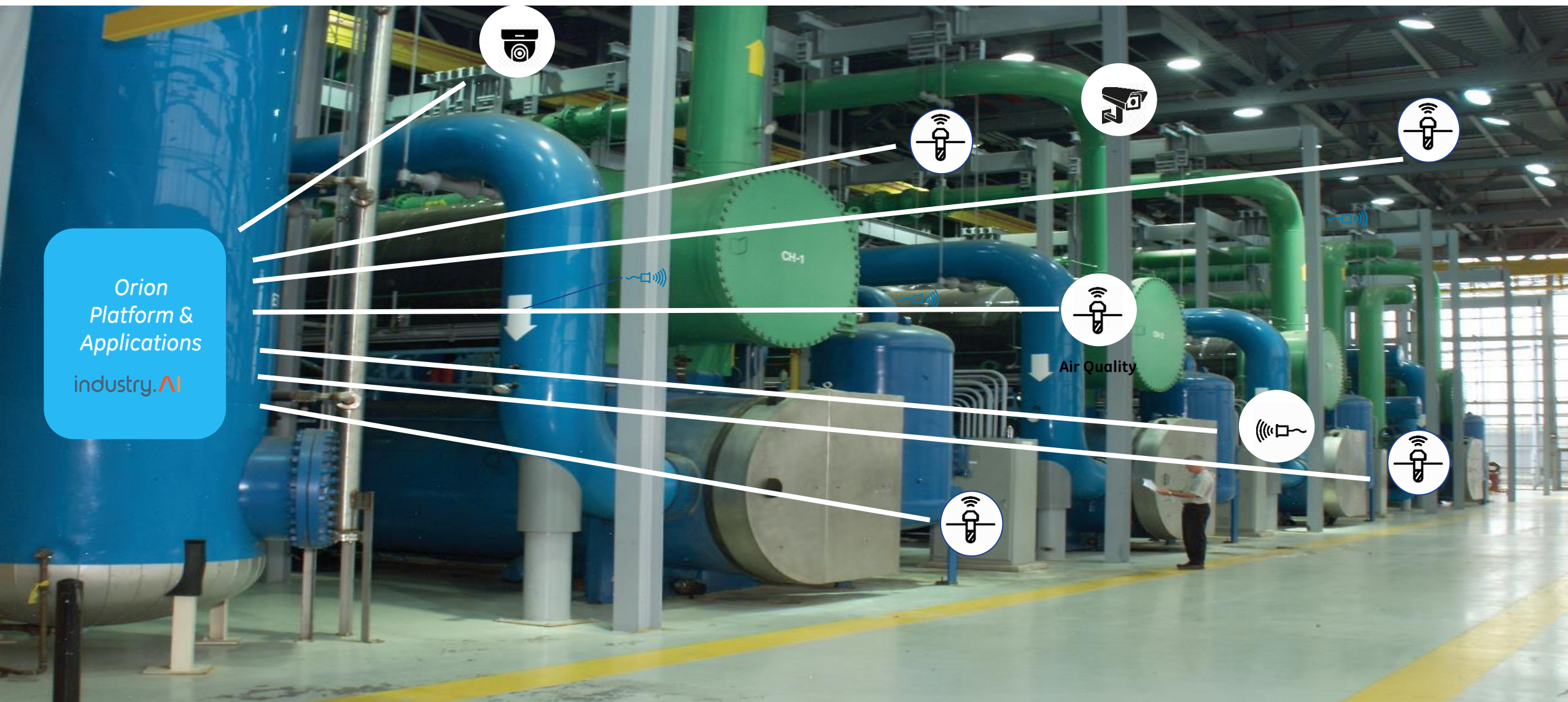
Orion  
Platform &  
Applications  
industry.AI



# Conserve.AI - Integrating all operational parameters of a factory onto one platform -



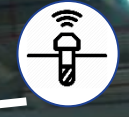
Process heating, motors, compressor, boiler, energy, water, waste, DG, etc.  
Using AI and IoT to improve operational efficiency and transparency



Orion  
Platform &  
Applications  
industry.AI



Air Quality



Application – Trust AI – Video Analytics for  
real time event detection – – Safety,  
Security and Quality



# Visual Analytics Platform

Delivering High Return on Investment



Hospitals,  
Hotels &  
Schools



Retail Stores



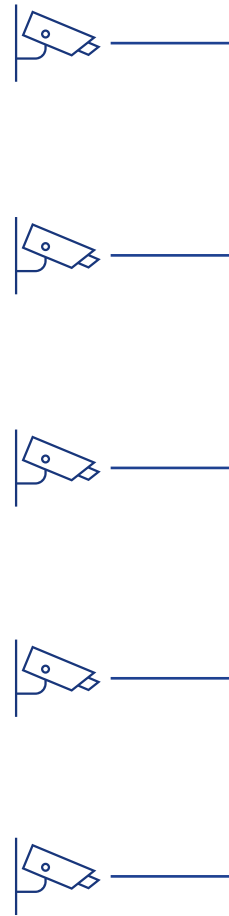
Commercial  
Buildings



Transportation/  
Supply Chain



Manufacturing/  
Warehouses



Existing Camera  
Feed Stored in  
Local Servers



Orion Platform  
In-House Algorithms

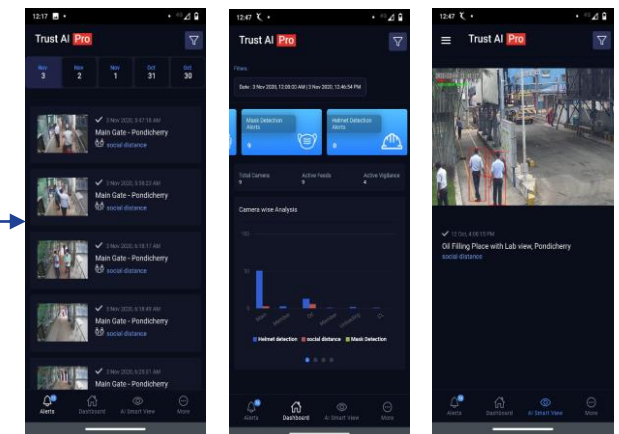


Advanced  
Analytics

Orion Cloud Platform



Predicative Analytics  
+  
Real Time Data

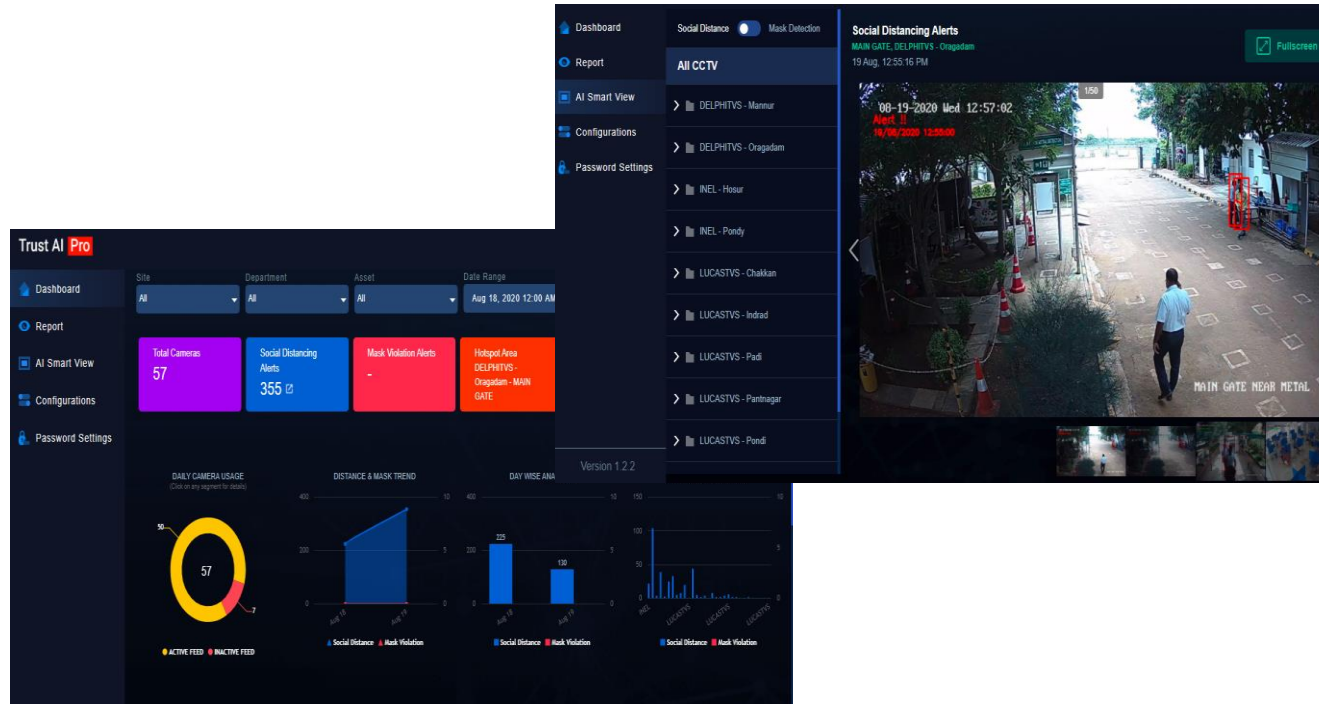


# AI Application - Visualization

## Transforming video feed into actionable insights

### ANALYTICS INTERFACE

Analytics Dashboards with Real-Time Metrics



### IN-DEPTH MONITORING

Ability to monitor each individual camera



# Data Metrics and Parameters



## Occupancy

Count People and Vehicles Entering and Exiting



## Age, Gender, Emotions

People Demographics



## Intrusion

Reliably detect intrusion into your facilities



## Dwell /Loitering

Time people spend in specific zones



## Queue Management

How long are employees/ customers waiting in line?



## Smoke/Fire Detection

Visually detect fire and smoke in camera views.



## Security

Object and people detection models to ensure safety



## Heat Maps

Visual representation Of Zone Data



## Throughput

Detect objects crossing specified edges of the zone



## Walk By

Managing walk in's



## Alerts

Maintenance & Security Alerts



## Parking Management

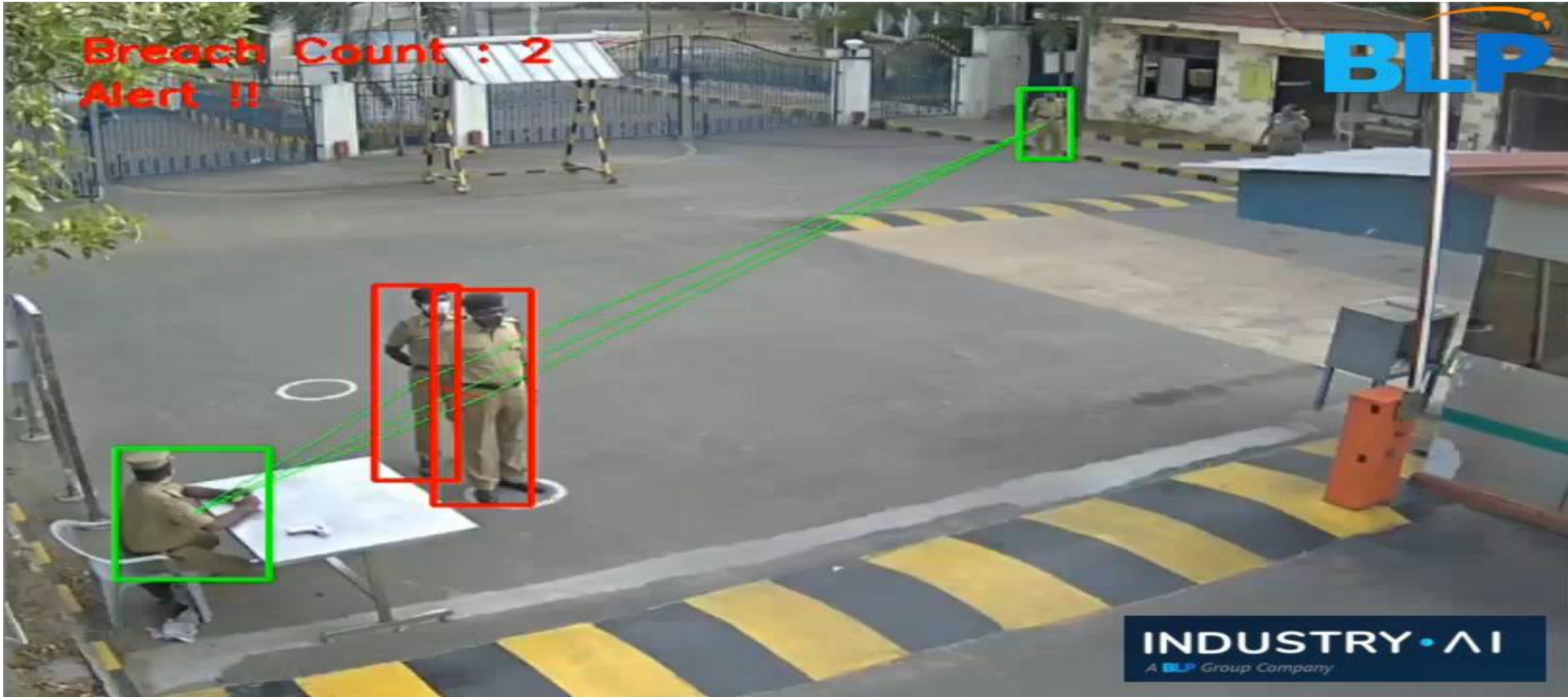
Vehicle Analysis

# Safety – Track usage of PPE and compliance of safety norms





# Safety - Social distancing using computer vision models



# Safety – Mask Detection using computer vision models



INDUSTRY • AI

A BLP Group Company

# Use Cases – Trust.AI...the future



Automation - video feed ingestion, enrichment & structuring



Quality - Track manufacturing defects on a production line correctly.



Safety - Visual inspection for PPE compliance in factories & ports. Monitor worker behavior in construction sites



Security - Real Time vehicular traffic monitoring

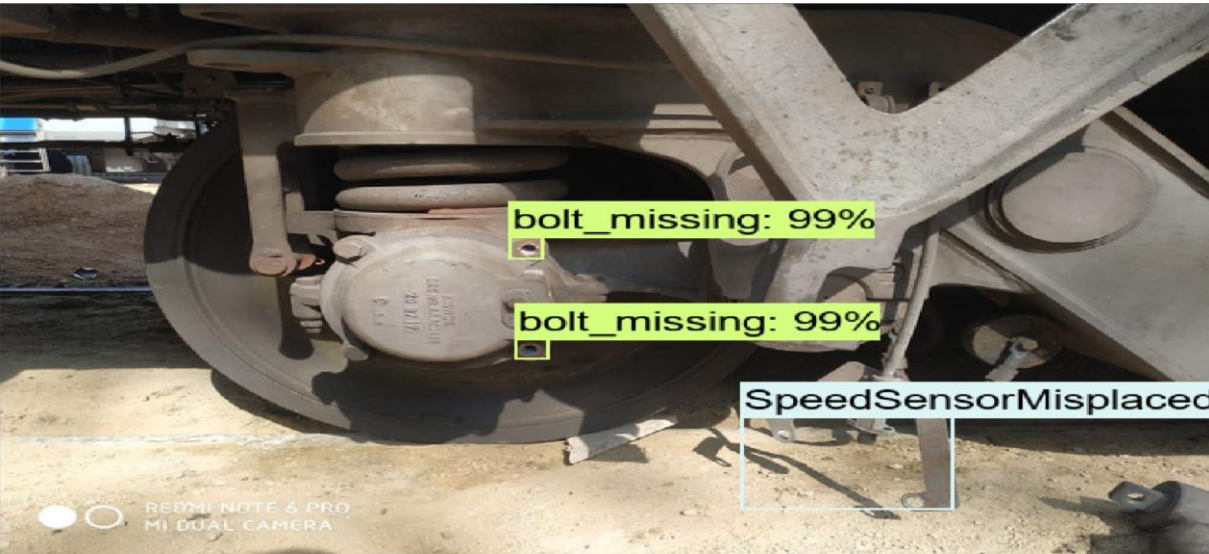
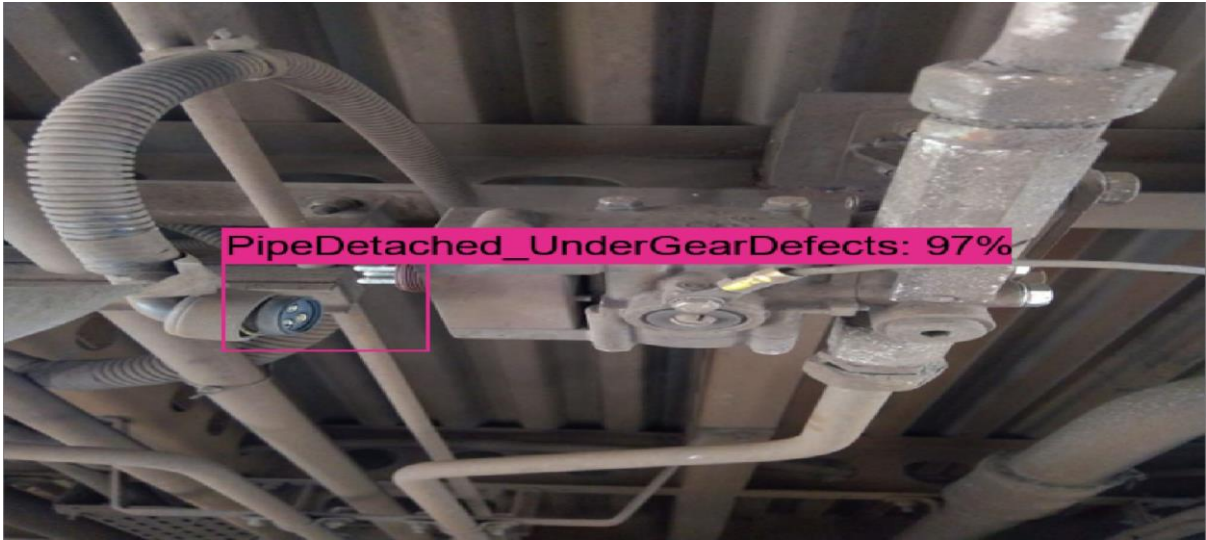
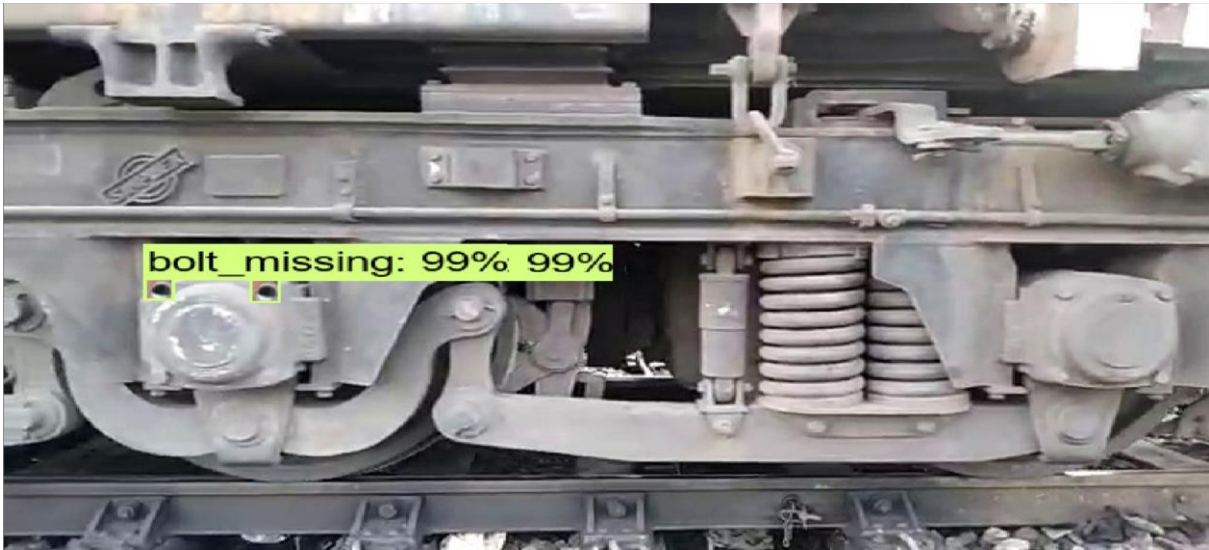


Visual auditing - Ensuring compliance of trucks, trains or windmills out in the field



Retail - Use a travel image to find retail suggestions in that area etc.

# Safety - Railways – identification of defects with Visual analytics



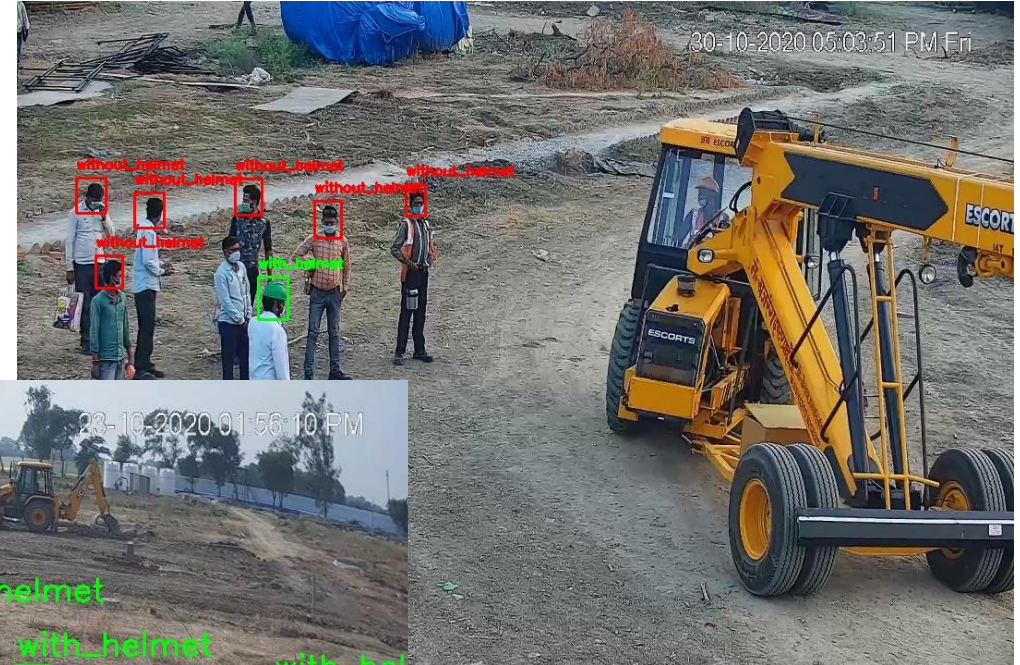
# Safety – Geo Fencing





# Safety – Construction Industry

Ability to scan large construction sites



## WORK SAFETY

- Wear Head Protection
- Wear Eye Protection
- Wear Face Mask
- Wear Vest
- Wear Hand Protection
- Wear Safety Boots

**SAFETY FIRST**



# Safety – Fire/Smoke

## Substations



2021/01/01 10:35:48



# Security – Warehouses

## Real time alerts using Visual Analytics



# Summary

- ✓ End to end solution. Digitize Operations through IoT solutions. Dedicated IoT team to install the devices and ensure connectivity
- ✓ Orion - Industrial digital ecosystem bringing together machine OEM's, telco, cloud, customers and IoT providers
- ✓ Integrated approach - Identify & capture data, analyse & visualize the data, and provide actionable insights through AI based applications
- ✓ Increase productivity through big data analytics....improve returns, and drive sustainability
- ✓ Improve competitiveness through digital transformation

# Thank You



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Video : <https://www.youtube.com/watch?v=ZdSYaWYo0pM>  
<https://industry-ai.com/covid-19/>

Website: [www.blp.co.in](http://www.blp.co.in); <https://industry-ai.com/>;