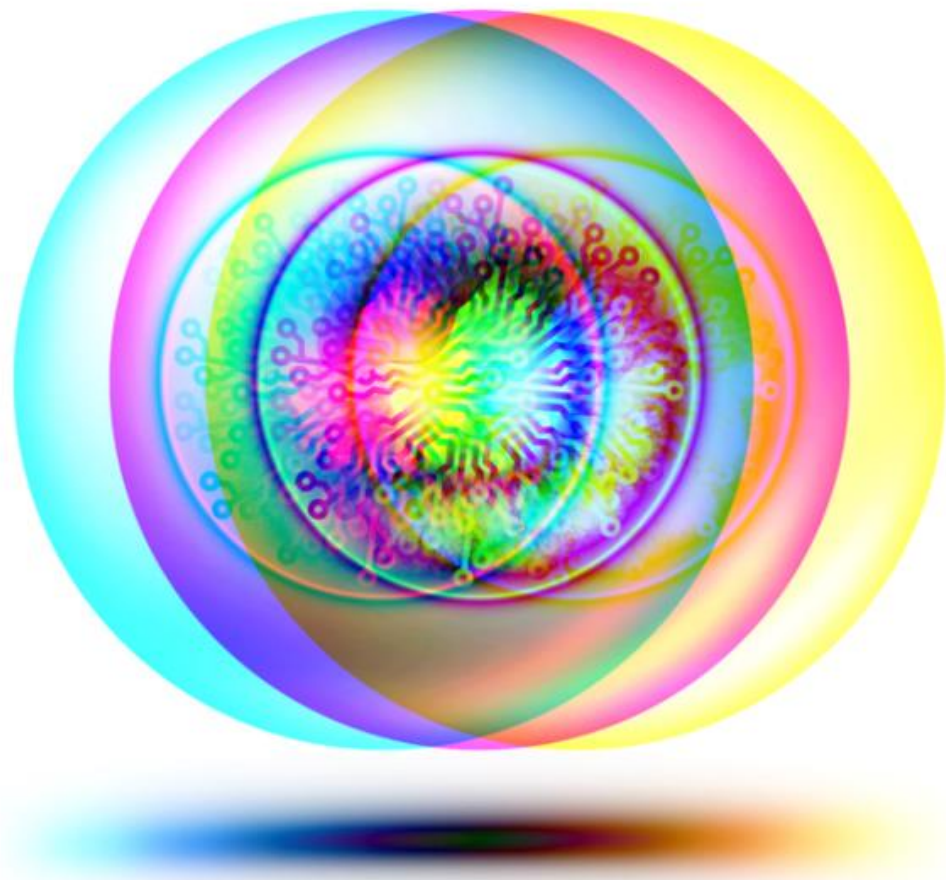




Empowering Industry Through AI

Using artificial intelligence to unlock the potential of Pharmaceuticals companies

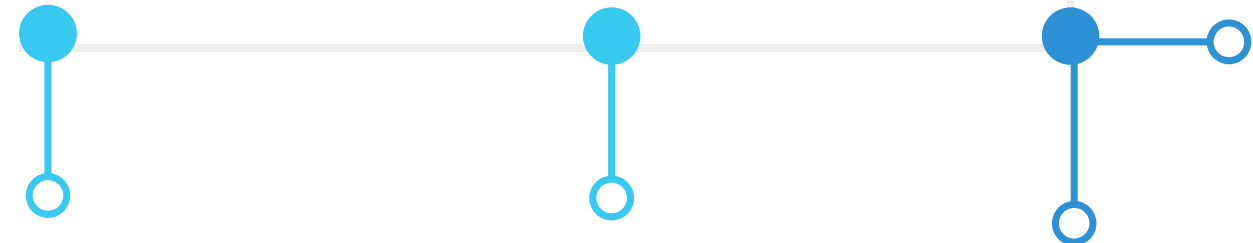


Eyes on the Future. Rooted in our Now.

Company Profile



Algo8: An Enterprise AI Company



2017

AI Based Process Optimisation deployed in an 11.3 MMTPA refinery

2018

AI Based Predictive Maintenance deployed in a Fortune 500 O&G company

2019

Our Enterprise AI Product Suite scaled up in 7 more refineries in India

2021 & BEYOND

Working across full stream O&G companies and across industries, including NLP Based Scheduling

2020

Foray into discrete manufacturing by including computer vision in Product Suite

Provide AI products that maximise overall productivity, availability, quality, safety, reliability and sustainability of operations through better decisions from data

6 AI R&D Labs Across India

Presence in India, Canada and USA

In the Top 20 Global Startups according to Vedanta Spark

Over 50+ clients including 6 Fortune 500 companies

Global channel reach with partners like IMPSA, Axess & Accenture



Nandan Mishra
CEO
Ex Citi, Google Maps



Himanshu Singh
CTO
Ex Cognizent



Nishish Jha
Chairman
Ex VP, HCL
Ex Chief Strategy Advisor, TechM



K.K. Jain
MD
Ex, IOCL



Praveen Kumar
CBO
Ex Founder Partner of two SAP
consulting companies

Our Management

Our Customers



P R E D I C T M E D I X



Testimonial

“The technology has brought about a 360-degree turnaround that has solved the critical setbacks such as leakages, pressures, temperature, vibrations and unplanned breakdowns. We have observed op-ex cuts by reducing the failure quotient of the equipment.”

Indian Oil

AI Solving Problems in Pharma Process

Contamination

Historical data to analyzed to determine what combination of impurities could potentially cause problems

Helps to identify of types of deviations ahead of time

Raw Material

Map process parameters and raw material characteristics to specific quality attributes

Adjust production processes in a consistent way to ensure product efficacy and quality

Equipment Failure

AI fix the problem before it affects the batches

User can interpret the reason for any deviations in order to figure out how to avoid such issues in the future

Process Unknown

Metrics and data available to be able to validate the critical process parameters

Root cause analysis to understand the root cause

AI Solving Problems in Pharma Process

Process Intelligence

- Batch quality prediction
- Golden batch Prescriptions
- Process Anomaly Detection

Asset Management

- Predictive maintenance
- Reduction of unplanned shutdowns
- Spare inventory optimization
- OEE

Compliance Adherence

- FDA compliance
- Operational
- Safety
- Quality
- Environmental

Supply chain optimization

- Inbound
- Warehouse
- Demand forecasting
- Network Expansion

Algo8's Enterprise Product Suite

Hardware agnostic, verticalized and replicable

iProcess

Quality Management
Throughput Improvement
Yield Improvement



AI

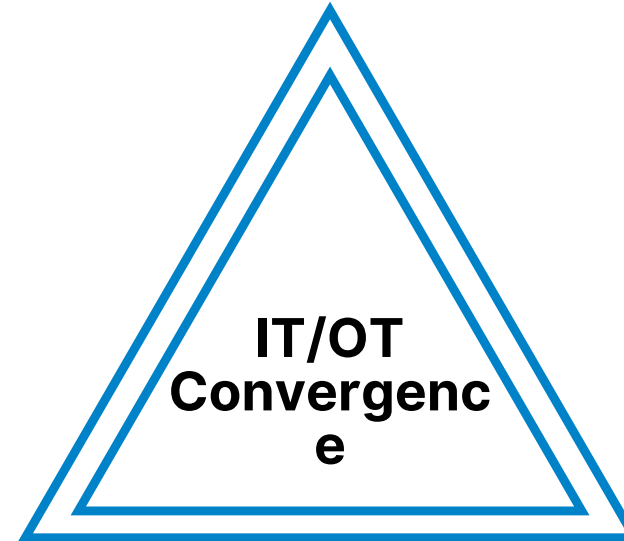


iAsset

Asset Performance
Improvement
Asset Predictive
Maintenance
Asset Spares Management



IT/IoT Data



IT/OT
Convergence



OT Data

iVision

Health, Safety & Security
Operations Monitoring
Quality Inspection



iConverse

Smart Scheduling
Data Extraction
Data Summarization



Algo8's Product Capability

We do not settle at just detecting constraints in your operations



Enterprise Product Suite

Detect

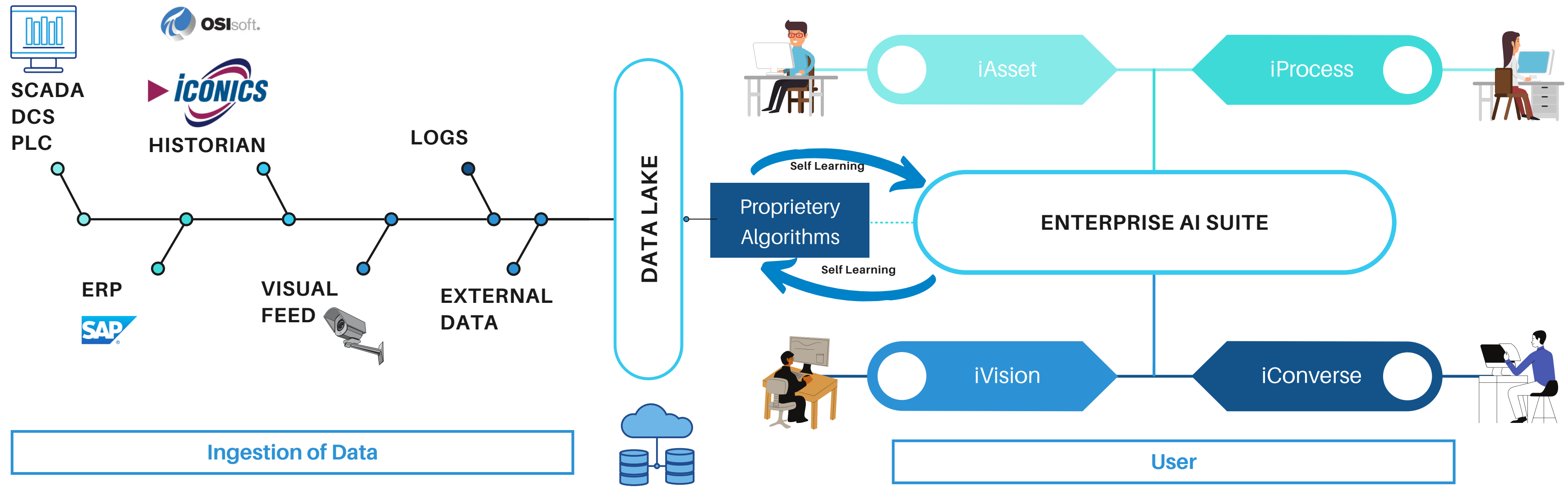
Diagnose

Predict

Prevent

Algo8 iAsset	Yes	Yes	Yes	-
Algo8 iProcess	Yes	Yes	Yes	-
Algo8 iVision	Yes	-	Yes	Yes
Algo8 iConverse	-	Yes	-	-

Our Architecture



How we work



Diagnostics – Consulting – Plant Visits

We review relevant, available data to provide context and background information around the current process, pain points and opportunities



PoCs

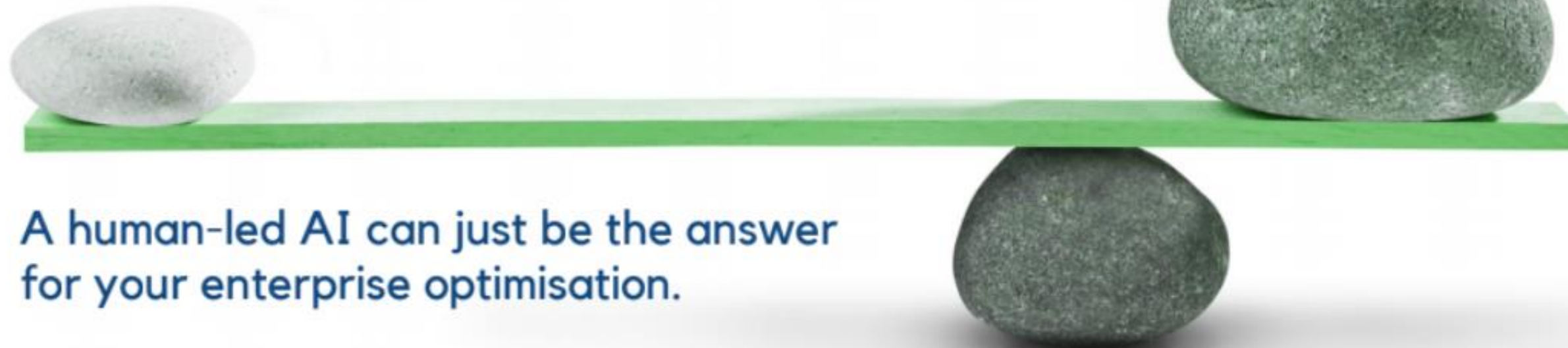
We list digital technology use cases for improving the KPIs prioritised as a roadmap.
We estimate magnitude of impact and feasibility through PoCs



Pilots and Scale Up

We replicate the learnings from PoC for multiple assets and processes for optimisation of your operations

Use Cases



A human-led AI can just be the answer for your enterprise optimisation.

Zero-contact Screening for Infectious Diseases

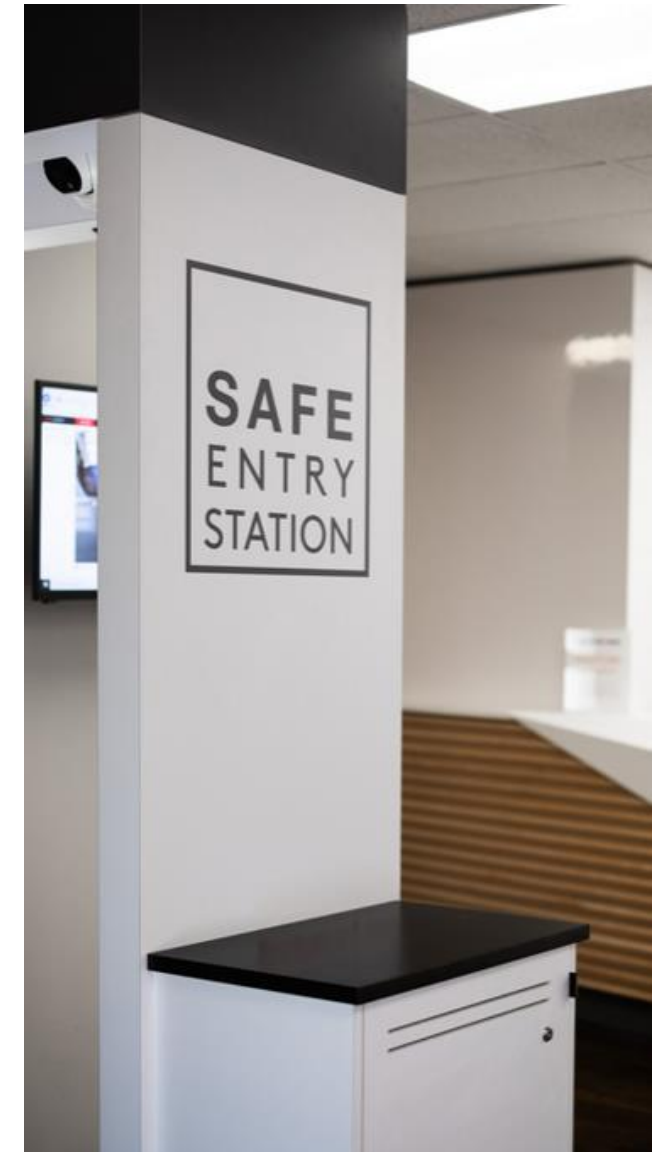
Algo8 is working with Predictimedix

to use AI for health and safety screening solutions

- Infectious Disease Symptom Screening
- Cannabis Screening
- Alcohol Screening
- Mental Illness Screening (Beta)



P R E D I C T M E D I X

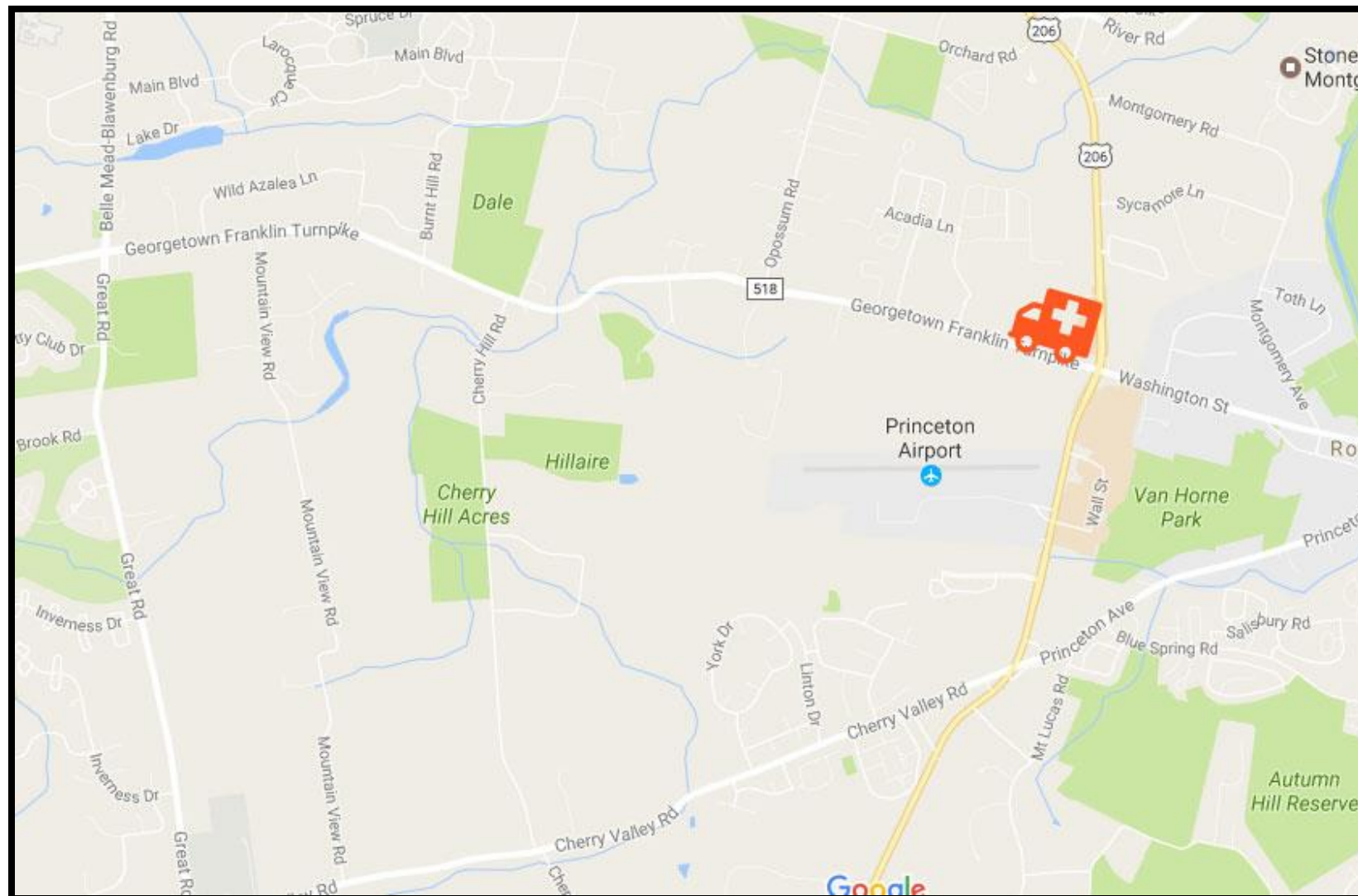


DEPLOYMENT IN CANADA

Ambulance Tracking

Challenge

Create a 'Smart Ambulance System' for tracking and dispatching ambulances using the real time location of the ambulance.



Approach

- Road information will be mapped and will be passed on to the driver with suggestions for alternative route
- Leverage the system as a single point of interaction between the driver and the medical team back at the hospital

Value Created

Calculate optimized routes and schedules with consideration of road topography and present traffic conditions

Centrally manage all vehicular movement via Live Cockpit to oversee the complete system in real time

Geo-fence your healthcare facility to get informed in advance about an ambulance's arrival

Single click interactions for dynamic or on-the-fly scheduling

AI enabled search engine for Healthcare

Challenge

A healthcare software company wanted to organize large amount of data and in a structured, unified and user friendly way. The company has a global connected network of doctors specializing in multiple or all domains which they want to consolidate under a central repository known as data lake.

Approach

- We created a database which had information in regarding medical imaging, genomic sequencing, labs, wearables, mobile health devices etc.
- We made our data lake architecture very comprehensive and supported by layers of security levels, to protect the real time data and patient's privacy

Value Created

- This data lake architecture allows doctors to seamlessly integrate into clinical trials and workflows
- In the future, we will integrate deep learning in the system so it can also recommend products and information addressing the user needs



Google Maps Based Visualization

Challenge

A healthcare giant want a unified interactive view of their healthcare resources and hospitals through India.

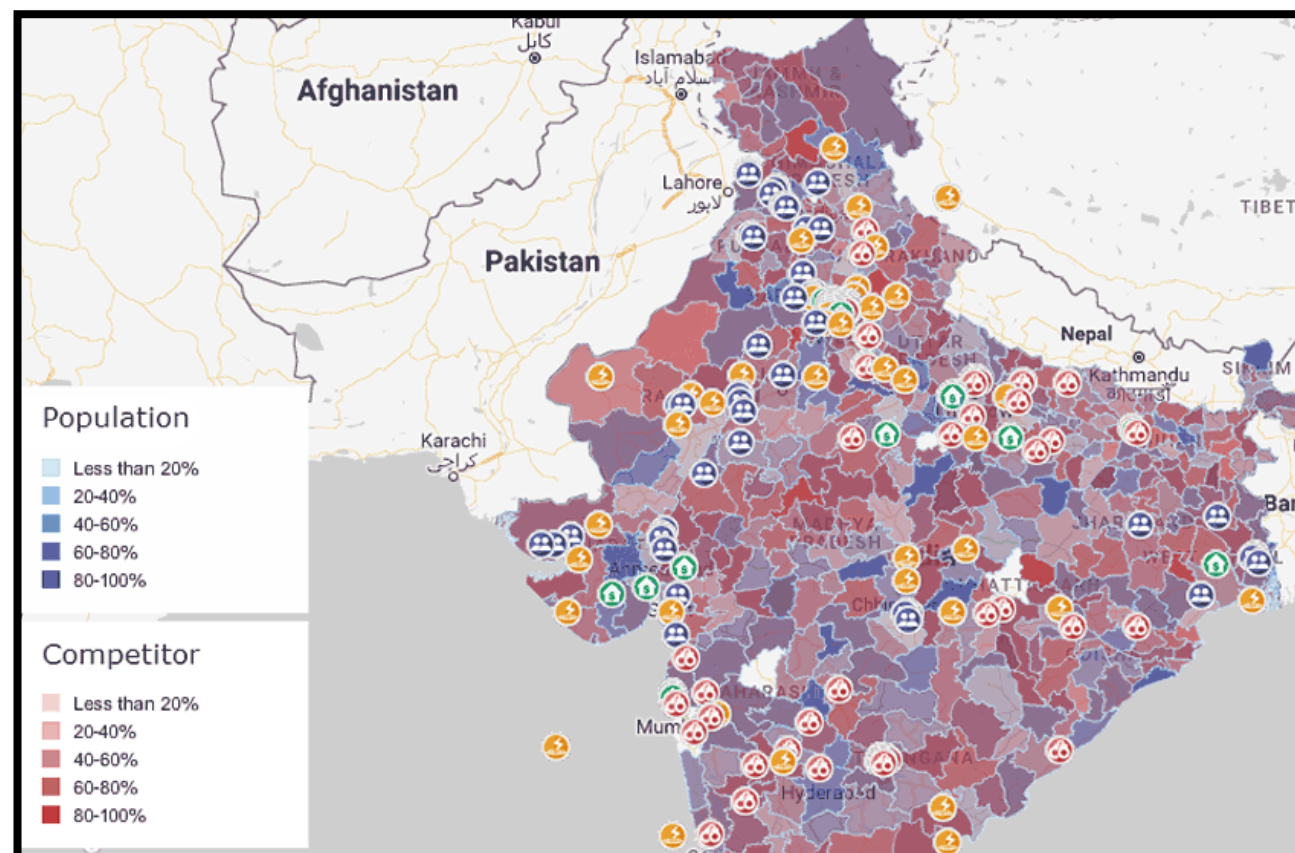
We used advanced Location intelligence and data visualization powered solution has been designed to empower the decision makers to make more informed decisions

Approach

- Identify areas that lack pharmacies, community clinics, and hospitals to set up your next healthcare facility
- Identify best regions to set up satellite clinics, walk-in clinics

Value Created

- Identify areas that lack health resources and have high concentration of diseases or accidents



Detecting Cannabis Impairment

Challenge

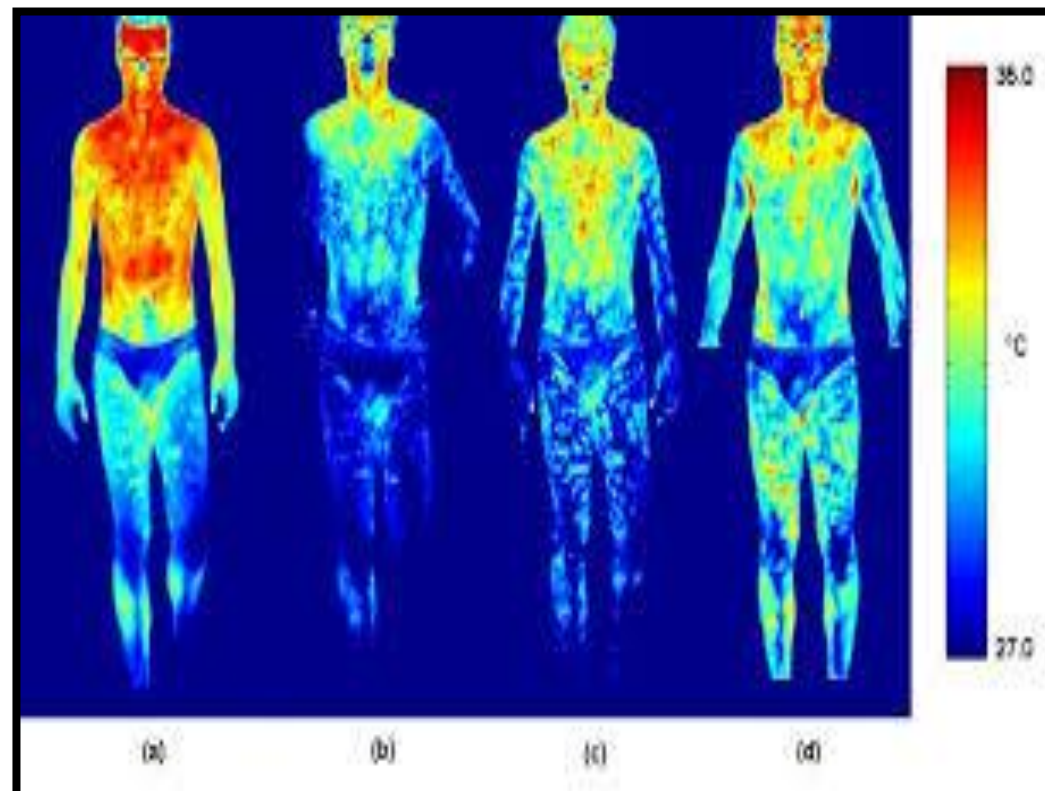
A healthcare firm was looking for a solution which can help them to detect impairment and the level of influence of cannabis and alcohol in people. We came up with a solution which integrated artificial intelligence, facial recognition and thermal imaging to detect impairment in that particular person.

Approach

- Thermal imaging was used to achieve this goal
- Information was collected in terms of thermal images of people under normal conditions
- These images were then verified with present thermal image of the person who may or may not be under the influence
- We are able to different signatures from the body of a person who is under the influence versus the person who was not.

Value Created

- The error was reduced close to 0% in identifying the right person as compared to breathalyzers
- Our client was able to see a lot of saving in time with an high accuracy rate of detecting the impairment of the respective person



Identifying Chronic Disease

Challenge

A solution was required to leverage deep learning technology to do more complex radiology tasks with high inter-reader variability. A chest radiograph (CXR) when integrated with a machine learning model can help in identifying abnormalities which were not visible to the radiologist at the time of X-ray and generate focus areas in the form of heat maps for each X-Ray image



Approach

Networking models like Convolutional Neural Networks are to be taken into consideration

Images stored from more than 1 million x-ray images from various centers along with their associated clinical reports

The chest x-rays contain multiple opacities, Tracheal shift, Cavity etc. which were tracked by customized object localization algorithms and denoted by bounding-boxes

Four parameters define a bounding box for every lung opacity. They are x-min, y-min, width, and height

Value Created

On comparison of the trained model's prediction vs. the ground truth, it was observed that the model's prediction performance was slightly higher than the predictions made by the radiologists

Out of 200 abnormal scans, 59%(118) were picked up from original CXR by reporting radiologist, and 67%(134) were picked up by the deep learning algorithm

X-Ray analytics to detect visual signals for Pneumonia

Challenge

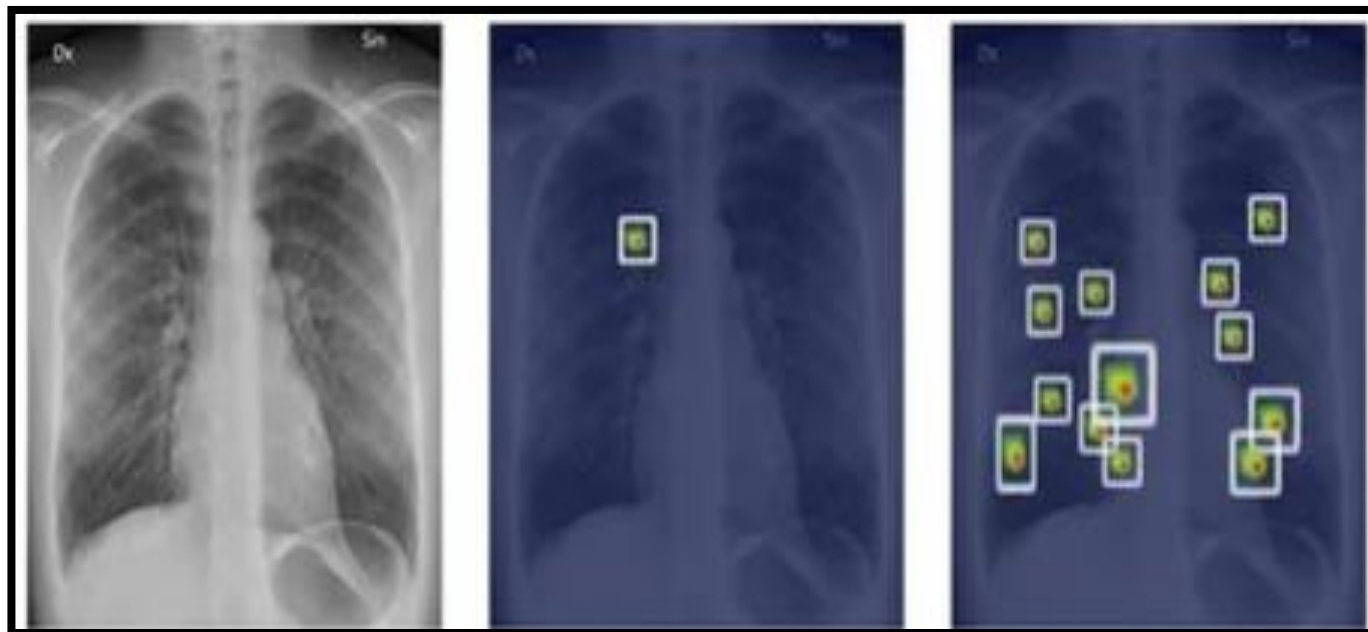
Building an object localization algorithm to detect visual signals for pneumonia in X-rays.

Approach

Creating comprehensive architecture for a deep neural network to detect lung opacities

We decided to use connected components labeling to segment the multiple areas of predicted pneumonia, and finally, a bounding box is simply drawn around every connected component

The chest x-rays tagged as pneumonia contain multiple opacities which are tracked by customized object localization algorithms and denoted by bounding-boxes (one per opacity)



Four parameters define a bounding box for every lung opacity. They are x-min, y-min, width, and height

Value Created

After inputting a chest x-ray image, it outputs the total probability of pneumonia accurately.

The output is provided in the format of a heat map indicating the areas affected by pneumonia with bounding boxes around them.

Accurate pneumonia predictions to enhance radiologist's diagnosis performance

Healthcare Fraud Detection

Challenge

The common examples of fraud and abuse in healthcare include the following:

- Illegal medical billing practices in which claims are falsified
- Multiple claims are filed by different providers for the same patient
- Patient identities are stolen and used to gain reimbursement for medical services never provided
- Collusion between unprincipled providers and their patients in which money from claims is shared

Approach

- Predictive Modeling
- Link Analysis - detect the relationships among people, providers, and claims
- Duplicate and Gap Testing
- Automated Entry Dates Validation
- Risk Scoring
- Spike Analysis
- Trend Analysis

Value Created

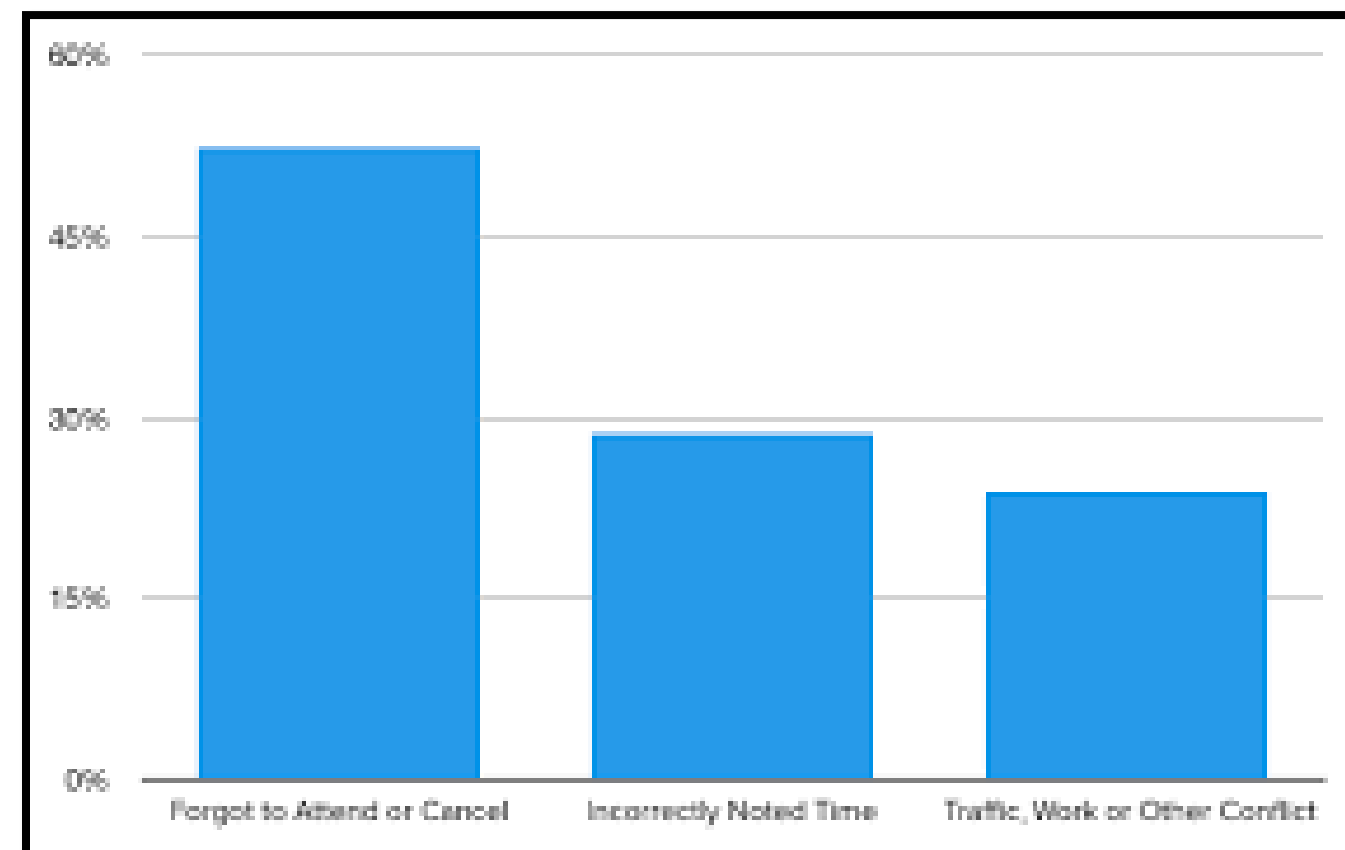
- Cost Savings and Protection
- Continued Increase in Fraud Prevention Through Continued Learning
- Payers Can Maintain Compliance with Government Prompt Payment Regs

Forestalling appointment no-shows

Challenge

No-shows have always been a challenge between patients and doctors. It is directly proportional to waste of cost and time .

Unexpected gaps in the daily calendar can have financial ramifications for the organization while throwing off a clinician's entire workflow



Approach

- Collection of data and compiling them in a central repository
- Using predictive analytics to identify patients likely to skip an appointment

Value Created

Providers may be able to use this data to send additional reminders to patients at risk of failing to show up, offer transportation or other services to enable individuals to make their appointments, or suggest alternative settings and times that may better suit their needs

AI enabled Chatbot for Healthcare

Challenge

On an average, a patient spends 60 minutes in reaching to the right doctor after reaching a hospital. It takes almost 30 minutes in finding out the right hospital or clinic.

A well-developed and advanced Chatbot system available to the patient can answer any initial concerns and drastically reduce the treatment time.

Approach

A chatbot which will gather information from the patients and referring an appropriate next course of action

Value Created

- Customer Service/Administration of Patient Engagement
- Research/Treatment
- First level primary care and Emergency first aid
- Answering the FAQs
- Dispensers of drug info
- Remote patient monitoring



Operations Module

Industry

Plastics

Challenge

Loss of man hours due to non-compliance by work force and unavailability of a platform to track the multiple processes in manufacturing

Solution

iVision Ops Module to identify worker unavailability, crowding, unavailability of feed and Machine operation tracking

Outcome

Worker level non-compliance tracking



Product Quality Module

Industry

Textiles / FIBC

Challenge

The client incurs 5% daily wastage due to weaving defects in cloth. Identifying defects is a time consuming and error-prone process exposing the client to liabilities and losses

Solution

iVision Quality module, integrated with Cutting machine to automatically remove defected pieces enables the identification of defect with a minimum size of 3 mm while the cloth is being cut at the speed of 100m/min

Outcome

Automated detection of defects and reduced wastage of cloth and time

The screenshot displays the 'Defect Details' interface for a defect identified on 24/12/2020. The main defect information is as follows:

Defect No: 4IINS	
CTR No :	455
Roll ID :	#81394IINS
Machin ID :	Machine 1
Timestamp :	12:56 PM
Type of Fabric :	ventillated
Type of Defect :	Weft missing
Acceptance :	Food Grade
Defect Size :	3.2 cms

Below the defect details, there are two main sections: 'Supervisor Inputs' and 'Comments'.

Supervisor Inputs:

Supervisor on Duty	Manoj Singh
Verification Result	Defect Identified Correctly
Action Taken	5 inches Removed

Comments:

Correctly identified

Reason of Defects: Reason 1

Other Comment: [Empty text area]

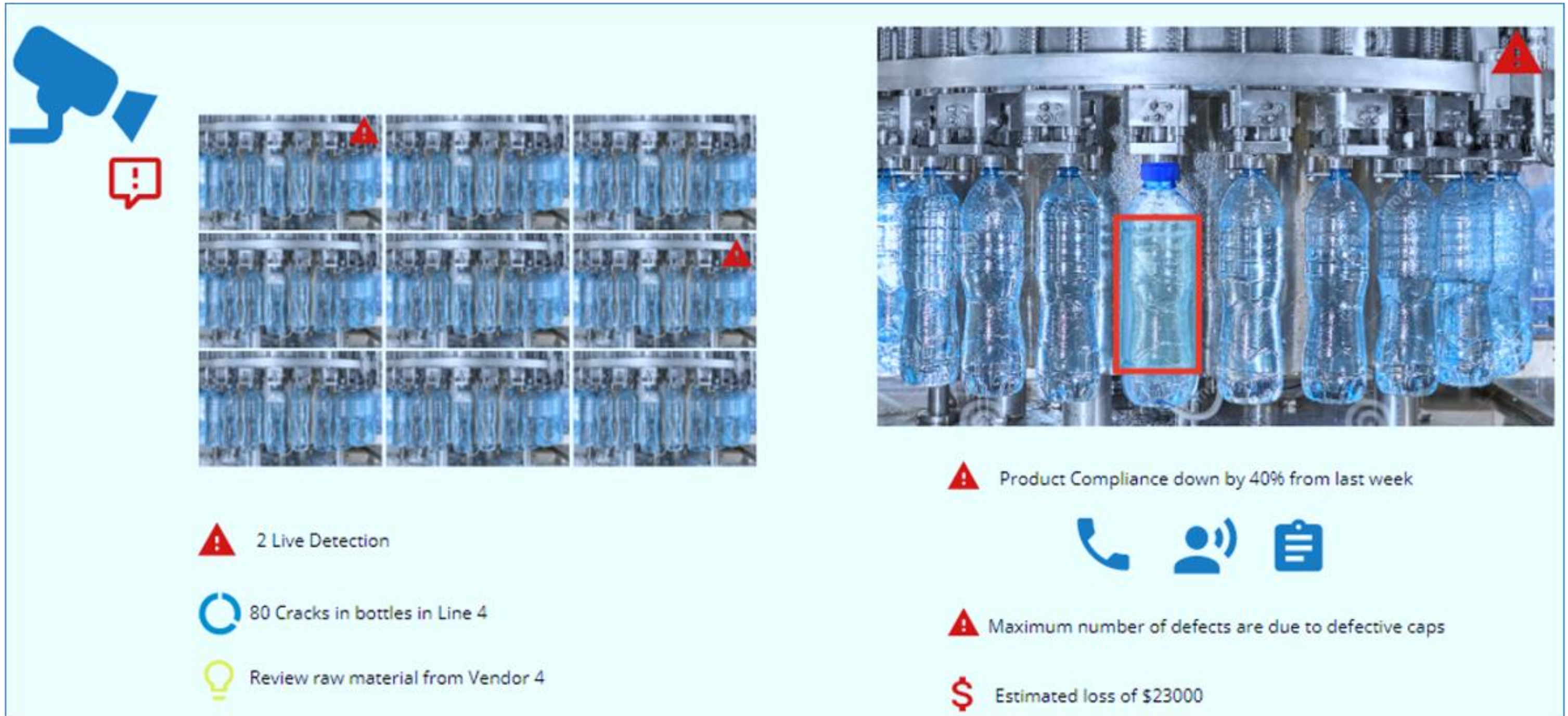
Buttons: Edit, Save

At the top right, there are controls for 'Time Period', 'Sort', and 'Filter'. On the right side, there is a section for 'Other Defects' showing a list of similar defects with their respective IDs, timestamps, machine numbers, sizes, and acceptance status.

Product Quality Module

Industry

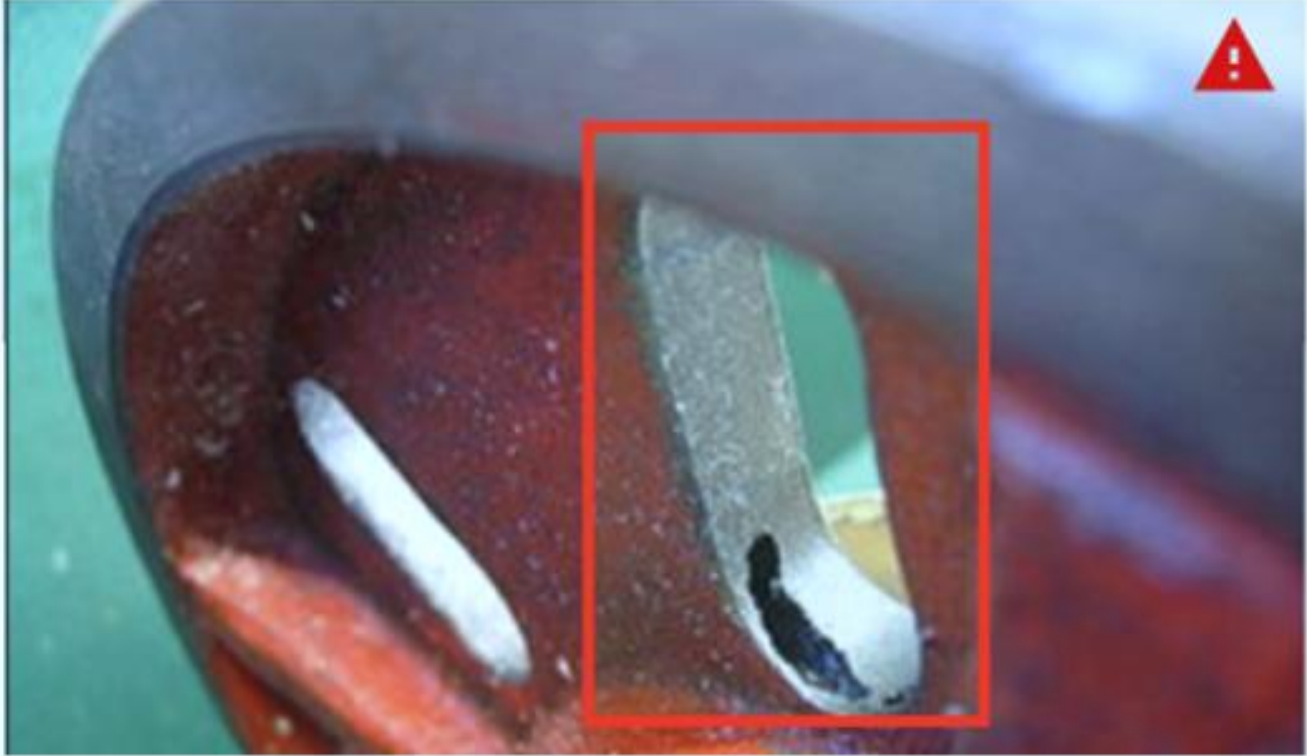
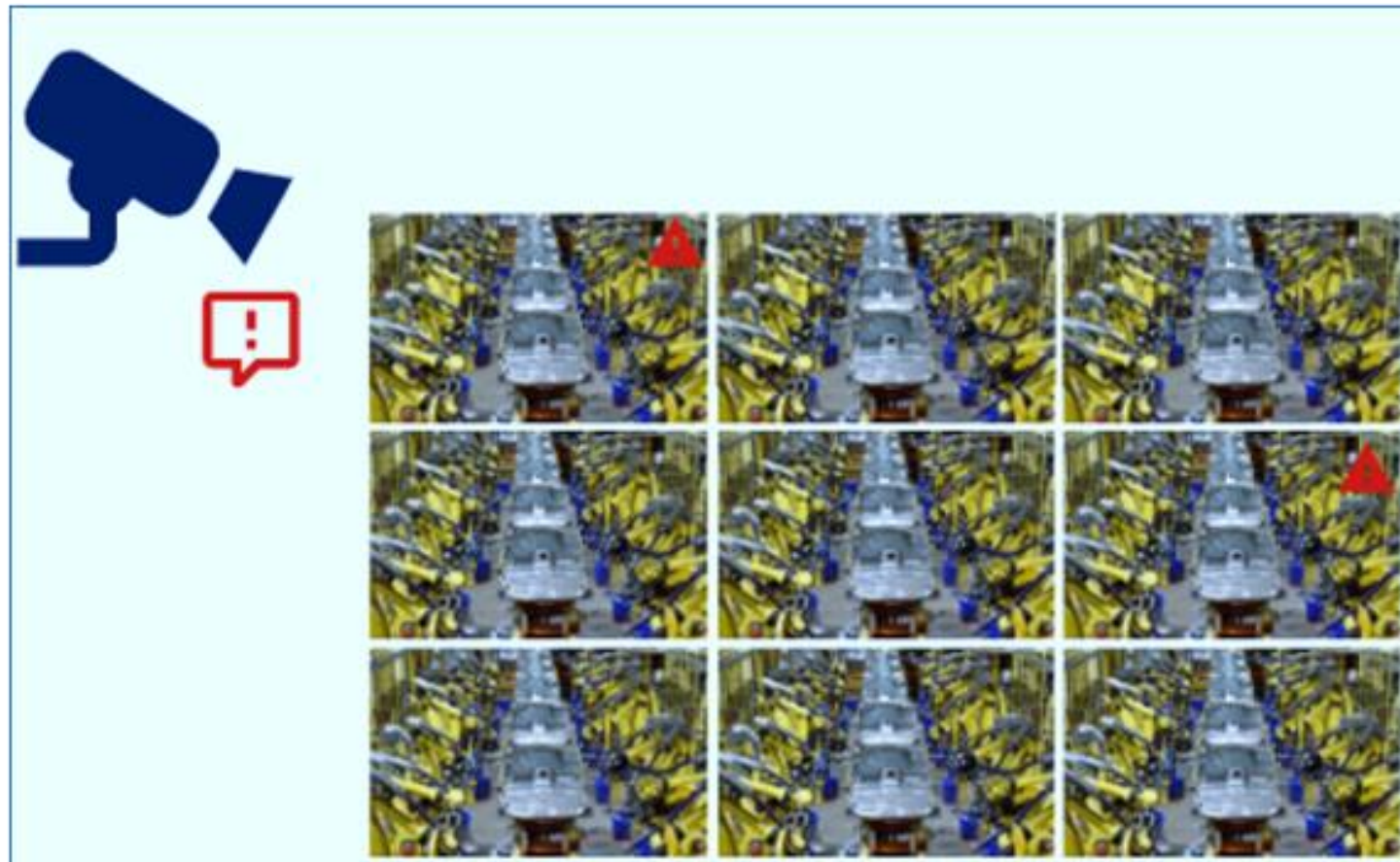
FMCG












Product Quality Module

Industry

Metals



-  4 Casting Defect Detection in Line 4
-  8 Similar Events in the last week
-  Meet casting department for quality audit of parts
-  40 Similar defects in the last week
-   
-  45% defects are caused due to defective casting
-  Potential Losses of \$45000/week

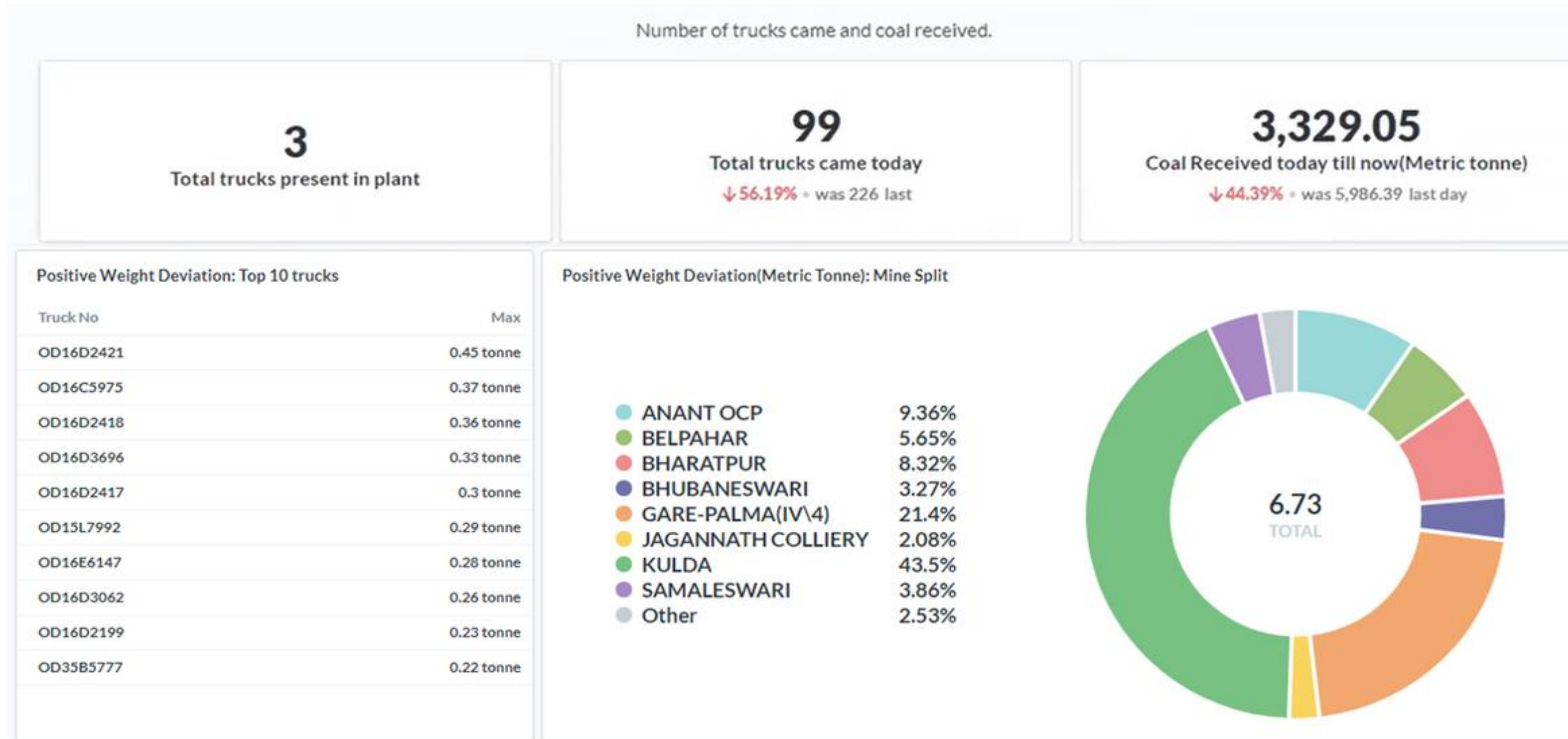
Inbound Coal Management & GCV Prediction

Challenge

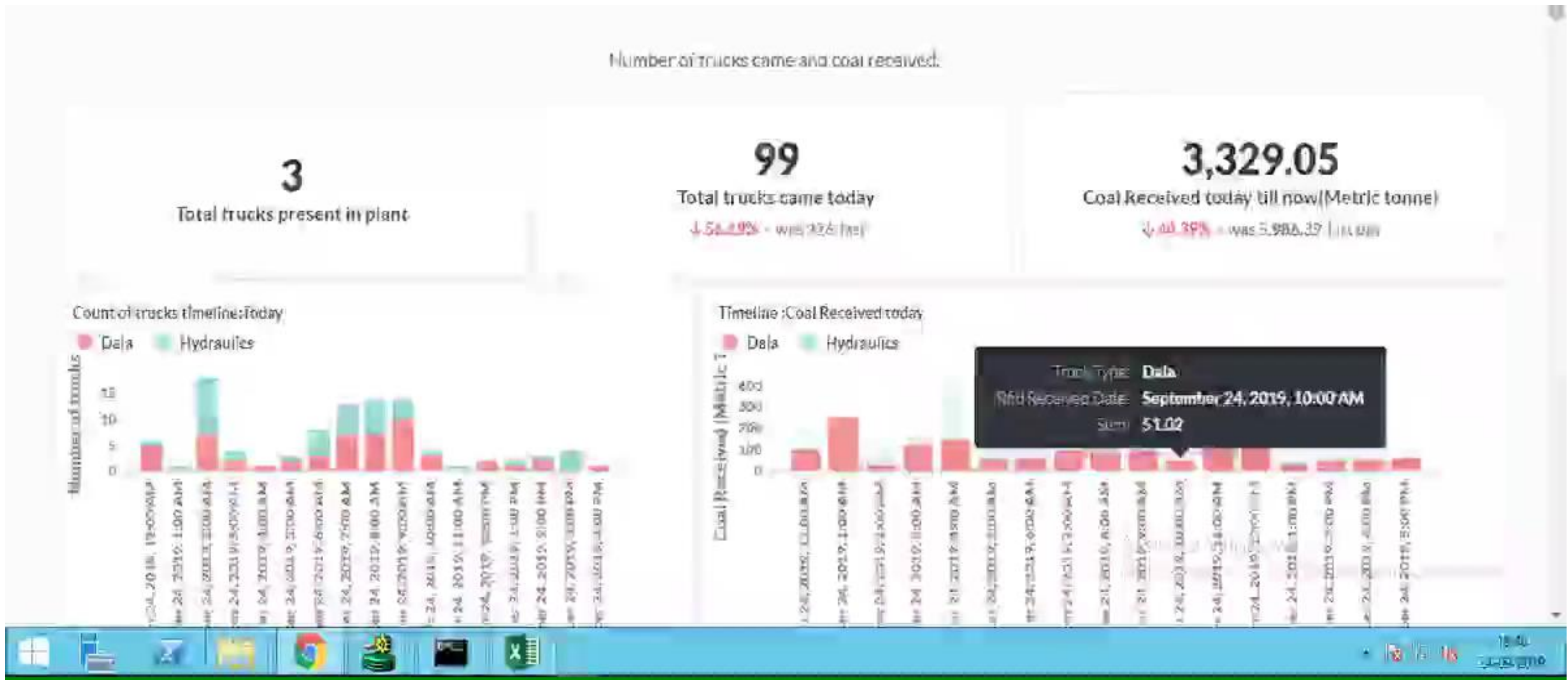
- Limited visibility on the coal supply chain for a captive power plant
- No integrated system to utilize data and records available to improve visibility

Value Created

- Real-time reconciliation as compared to 3 months earlier
- Periodic review of KPIs and factors causing deviation in incoming raw materials
- Improved visibility around the supply chain of the process



Inbound Coal Management & GCV Prediction





AI-powered Cognitive Process Optimization

Challenge

A leading oil company, in their attempt to increase production of Polypropylene got caught up in lump formation. This led to increased downtime and operational expenses.

Approach

- Our team of data scientists started with identifying “tags” (MFI & xylene) causing the lump formation.
- We study the relative importance of various operational parameters and their dynamics in different operational conditions.

Value Created

- Recall of Quality prediction accuracy of 90+%
- Improved quality prediction.
- A model which can notify a possibility of lump formation 5 minutes prior to the event
- Real-time & continuous lump prediction graphical interface to display this information
- Forecasting tool creating situations and stimulating “what-if” scenarios for helping achieve expected and desired quality targets.
- Actionable & useable Insights within the system.

Cognitive Process Improvement

- Homepage
- Reactor 310
- Reactor 320
- Reactor 410
- Projection Window

R -310 Predicted Values

5.14	MFR
2.93	Xylene
02-06-2019 23:33:48	Refresh Time
Export	

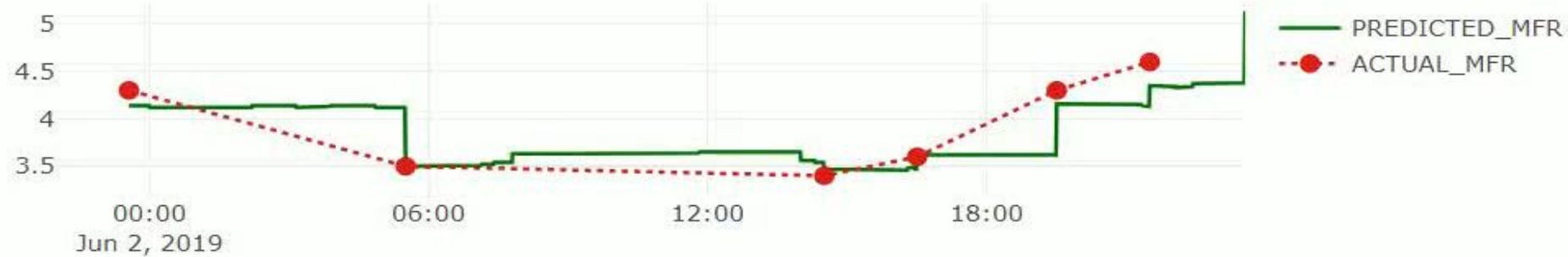
02-06-2019 21:45:00	Notification Time
Lump to be formed in next 5 minutes	Lump Notification
<input type="button" value="OK"/>	

R-310

Actual Vs Predicted Xylene



Actual Vs Predicted MFR



R -320 Predicted Values

	MFR
--	-----

R-320

Actual Vs Predicted Xylene



AI-powered Predictive Maintenance

Challenge

A leading petroleum company wanted to have predictive maintenance for refineries, particularly for its critical equipment.

Approach

- Our data scientists built an anomaly model using a system of processing and analyzing data.
- A few of the data points used for the analysis were: Equipment health, Operational data, Process data and Maintenance data (for cross-validation)

Value Created

- Our team tested the model in a controlled environment, based on historical data.
- Then it was put in production by setting up the required infrastructure and process flow, identification of various tags and a predictive analysis.
- A Key Performance Indicator (KPI) as defined by SME was created and dashboard development for the same was done.

AI-powered Predictive Maintenance

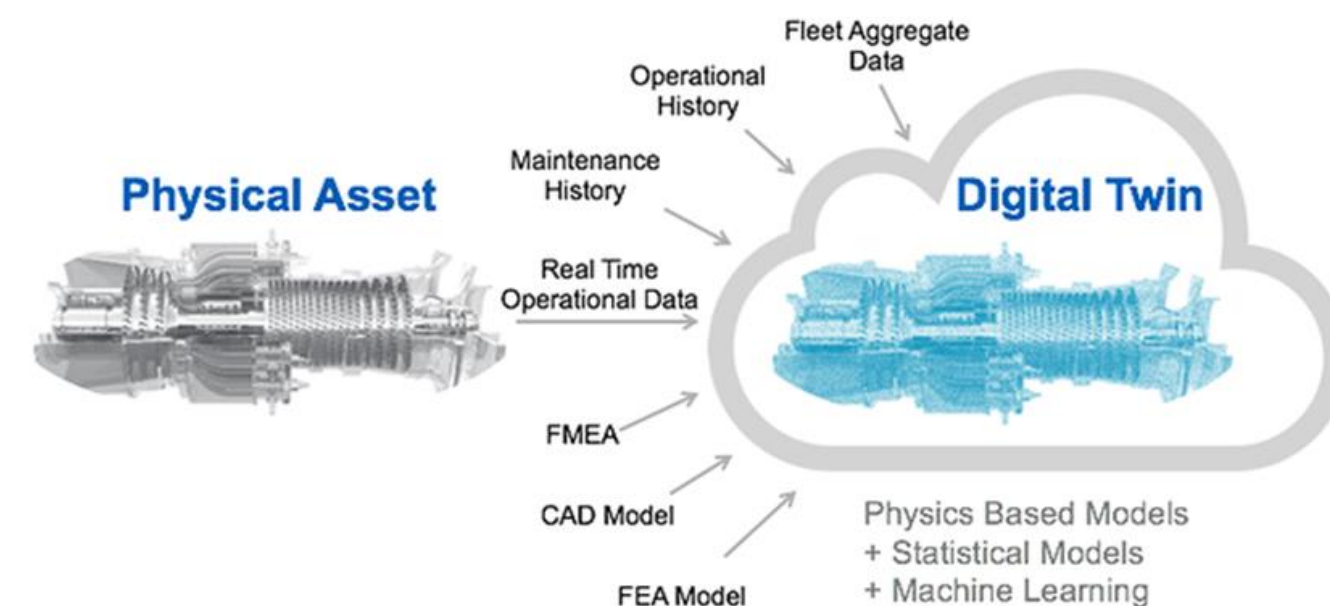
Digital Twin of Critical Rotary Assets

Challenge

- There is no single view of assets. Centralized asset information is not available to make decisions. Managing complexities and linkage within systems-of-systems is difficult.
- Supercritical equipment's shutdown will lead to discontinuation of the refinery units which is unacceptable due to huge economical loss.
- Need to predictively track the asset health and performance

Value Created

- Visualizing products in use, by real users, in real-time.
- Building a digital thread, connecting disparate systems and promoting traceability.
- Managing complexities and linkage within systems-of-systems.
- Optimize their efficiency and reduce downtimes significantly.
- Improved predictive maintenance of equipment and testing load conditions
- Elimination of prototypes development for R&D purposes.
- Fault analysis, performance analysis etc.



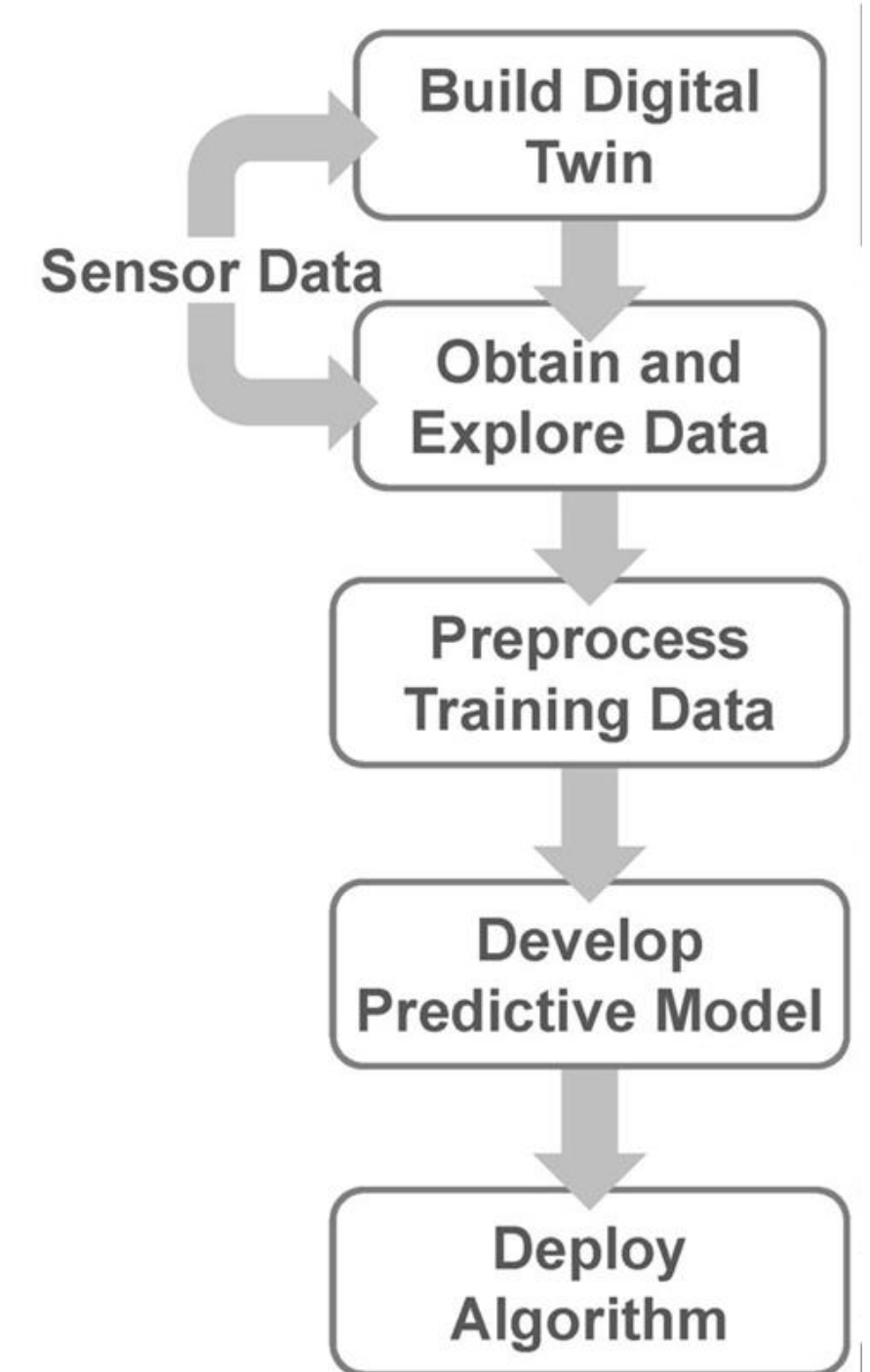
Digital Twin of Process Unit

Challenge

- Modelling the complex chemical processes and related mass & energy balance and reaction kinetics of each unit.
- Managing complexities and linkage within systems-of-systems.
- Tuning of the combined full-scale virtual model.
- Variations in crude/ feed quality, yield requirements and operating conditions make it a highly dynamic system for modelling

Value Created

- Easily optimize each process unit's efficiency and reduce downtimes significantly.
- Testing of equipment and at diverse load conditions.
- Elimination of prototypes development for R&D purposes.
- Process Anomaly Detection and Fault analysis,
- Real-time Product quality prediction and unit performance analysis
- The life expectancy of the processing unit can be estimated.
- The dynamic behaviour of a processing unit can be incorporated into the model, providing better visibility of unit behaviour



Corrosion Prediction


Challenge

- Corrosion affects every metallic structure in the oil and gas industry. They cause huge losses of revenues to the oil industry as a result of repairs of parts and maintenance which eventually leads to plant shut down and downtime

Value Created


- Optimizing the inner side corrosion by control and manipulation of other control variables
- Corrosion can be tracked both inside and outside of the unit

CHECK RESULT



ADD IMAGE

Your Results:
Overall Rust Percentage: 46.44%



Our Deployments



A human-led AI can just be the answer
for your enterprise optimisation.

iAsset

Pain Point

A single unplanned shutdown due to failure of a rotary equipment can cost a refinery USD 500K

Current Tech

Rule Based
Conditional
Maintenance

Our Solution

AI Based Predictive Maintenance
- We can predict failure of critical machines with a lead time of 70-100 days



Customer - Downstream O&G company

Market Cap - USD 70 Billion


Increase in availability of equipment - 10%

This has been successfully deployed for a Fortune 500 company and has reduced maintenance costs by 25%



iProcess

Pain Point



Output grade deviation in a reactor, leading to off-spec batch production and quality issues

Current Tech

Lab Testing of batch with a lag of 6 hours

Our Solution

AI Based process optimisation to predict batch quality with 95% accuracy using historical data

Customer - Downstream O&G company

Refinery Capacity - 11.3 MMTPA

Days of efficiency gained - 26 days

Our customer saved approximately USD 11 Million by preventing lumps during a reaction in PP Reactor and reducing off-spec production



I P R O C E S S

iVision

Pain Point

Human eye cannot always capture minute defects in the manufacturing process and SOP/Safety lapses

Current Tech

On-Site Manual Inspection

Our Solution

AI Based visual inspection of key equipments, processes and operational areas to reduce on site visits by 90%



Customer - Major FIBC Manufacturer

Production Capacity - 15 Million FIBCs

Improvement in Bottom Line - 20%

Our customer has digitally transformed its manufacturing process by reducing wastage by 30%





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Journey with us

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LinkedIn

[https://www.linkedin.com/company/
algo8/?originalSubdomain=in](https://www.linkedin.com/company/algo8/?originalSubdomain=in)