IADC Spark Tank

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Flutura At A Glance

cerebra

Artificial Intelligence based Industrial IoT Platform

1000+

Person Years of Engineering, IoT, Data Science Expertise

Recognized By

Forbes

REUTERS

Deloitte. Technology Fast50

Bloomberg

FROST & SULLIVAN

Excellence in Technology Award

Key Partnerships

IADC

HALLIBURTON iEnergy

Rexroth Bosch Group

Microsoft

SAP startup.focus. Member

HITACHI Inspire the Next

World Renowned Subject Matter Experts

Duane Wilson
Former Executive
ConocoPhillips

Steve Reeves
Former Executive
Shell Oil

Nick Paris
Petroleum Engineering
Expert, Chevron, BHP

Kevin Morris
Former Executive
Shell Oil

Gordon Bethune
Board Member,
Honeywell

Jerry Allen
Former Chairman
Cooperheat

Rohit Bhayana
Former CEO
GE Software Solutions

Brit Svoboda
Chairman, Advanced
Infrastructure Technologies

World's Most Innovative Companies Use Cerebra

1200
Manufacturing Lines

165
Rigs

300
FLNG & High End Vessels

50
Wells

120
Heavy Machinery Fleet

460
Commercial facilities

TechnipFMC Honeywell UOP HITACHI Henkel GTT Expert in LNG STEWART & STEVENSON

Flutura Actions! Not just Insights

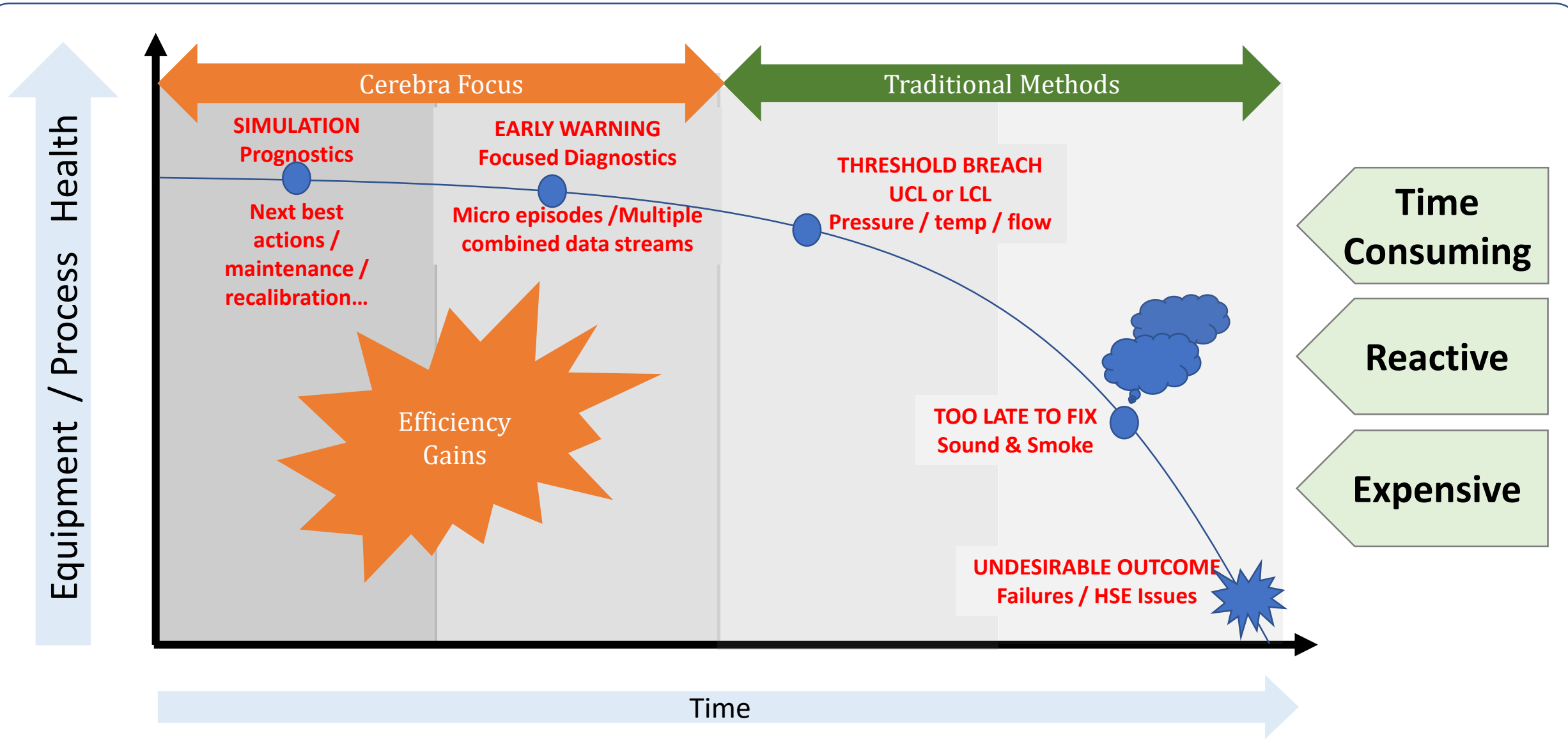
What Flutura Does

Cerebra Industrial IoT Platform

Enables

1. **Reduced Operating Cost**
2. **Reduced Unscheduled Downtime**
3. **Increased Output**

Cerebra's Focus



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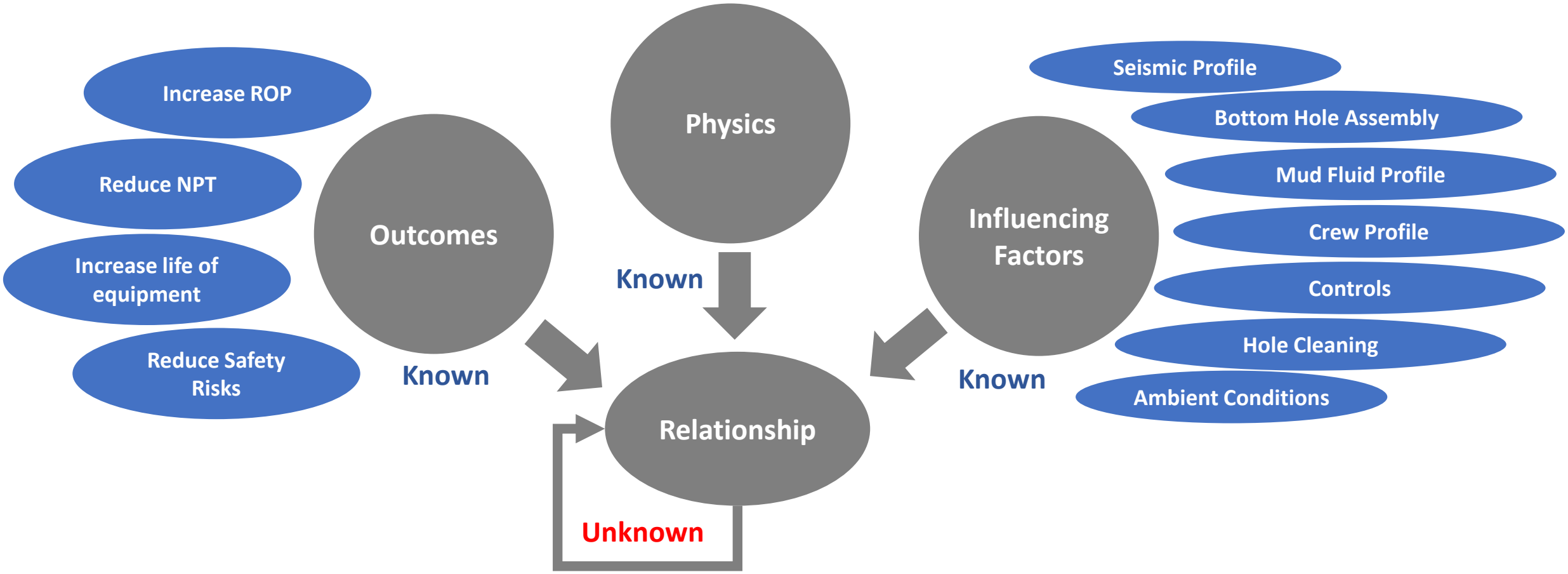
Cerebra in a Nutshell



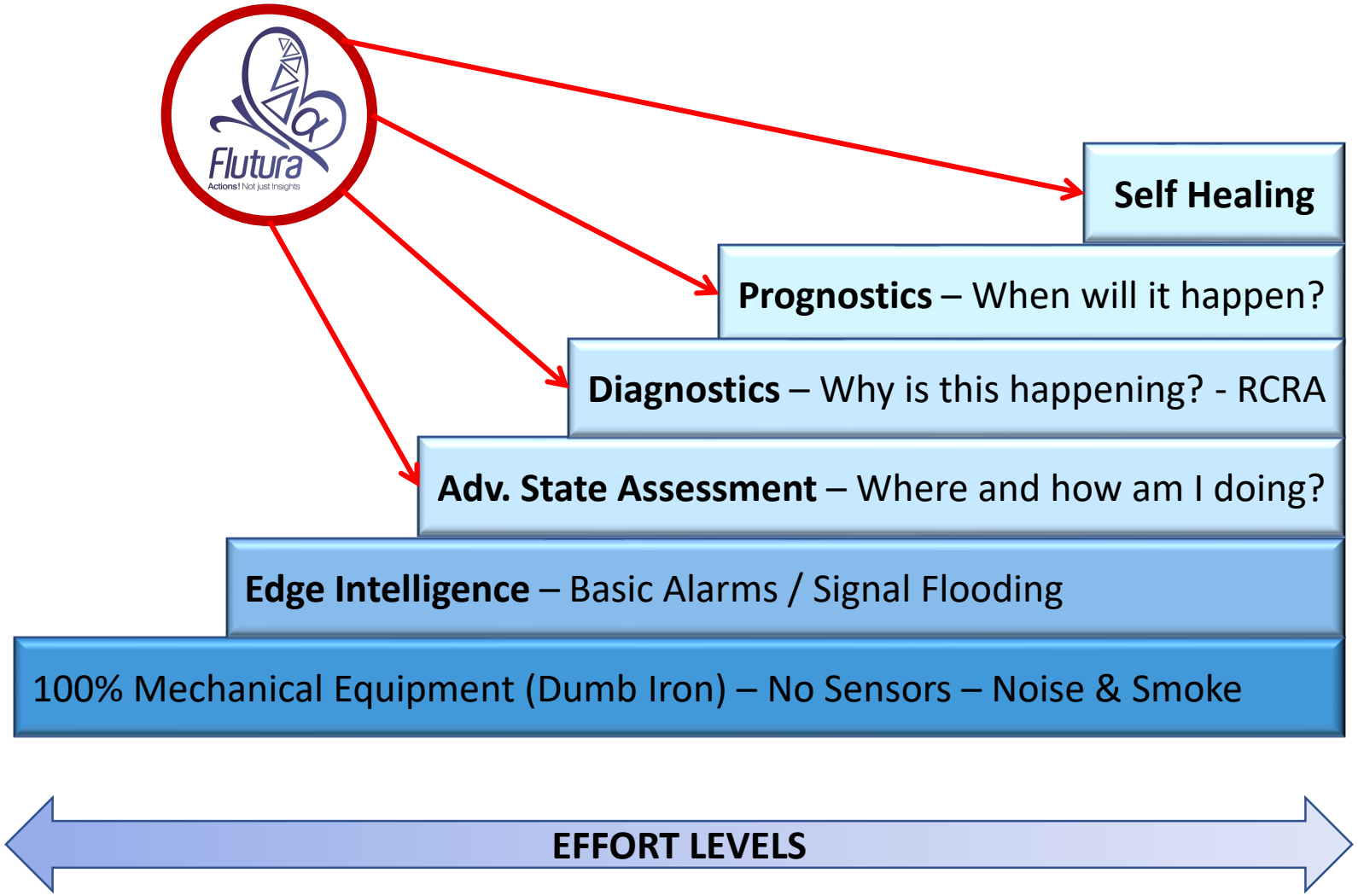
Physics Informed Machine Learning & Reinforcement

Engineering + Data Science = cerebra

Industrial IoT and AI Journey

Personnel Experiencing Pain

1. Maintenance crew
2. Process Line in Charge
3. Reliability Engineer
4. Command center
5. Design engineer
6. Owner/Operator
7. Digital BU Head



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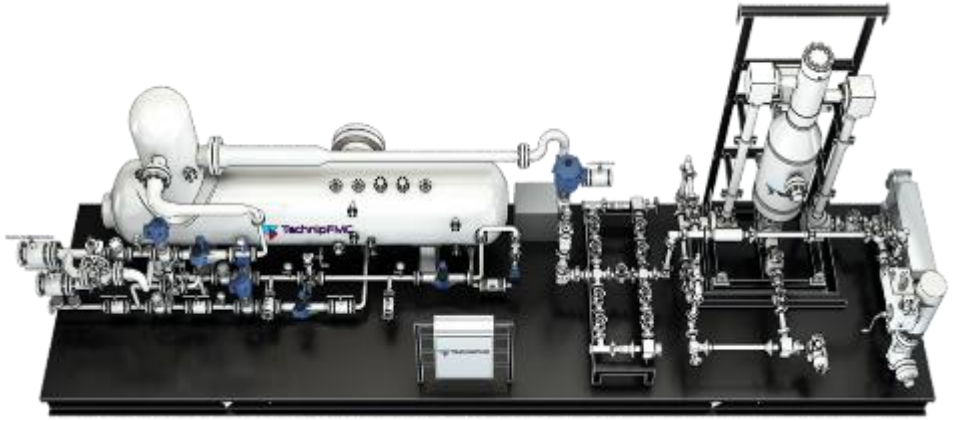
Powered By cerebra

Surface Production Equipment

About Customer



Mission Critical Subsea and Surface Equipment Manufacturer

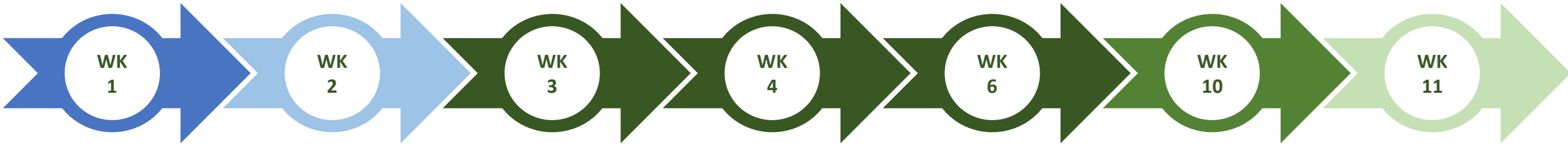
High Pressure Operating Environment

Real time System Calibration

High Fidelity Job Completion

Business Benefit Delivered

- Aided field operators to fix interface levels & pressures, without risking being close to the EPS unit
- Alarm notifications helped in achieving operational efficiency
- Operators were able to see the impact of changing choke sizes / set points by trending and analyzing various parameters on Cerebra platform
- Flowback reports were automated – thus eliminating manual collection of data points and errors that may be associated with it



Prepare & Ideate Workshop Readiness Assessment

Crystallize Blueprint

Digital Twin Realization Data Acquisition

Cerebra aided **Sensor Rationalization**

State Assessment

Cerebra aided **Sensor Calibrations**

Simulation Test

First time Visibility into **Flow Performance**

Pilot

Cerebra for the first time aided **Flow Analysis**

Operate

Operator thrilled to see **Initial Operational Insights**

2

Powered By cerebra

Completions

Customers Context

Frack Pump

Coil Tubing Unit

Acidizing Units

Varied Types of Equipment - Sophisticated, Mission Critical and Expensive

Blender

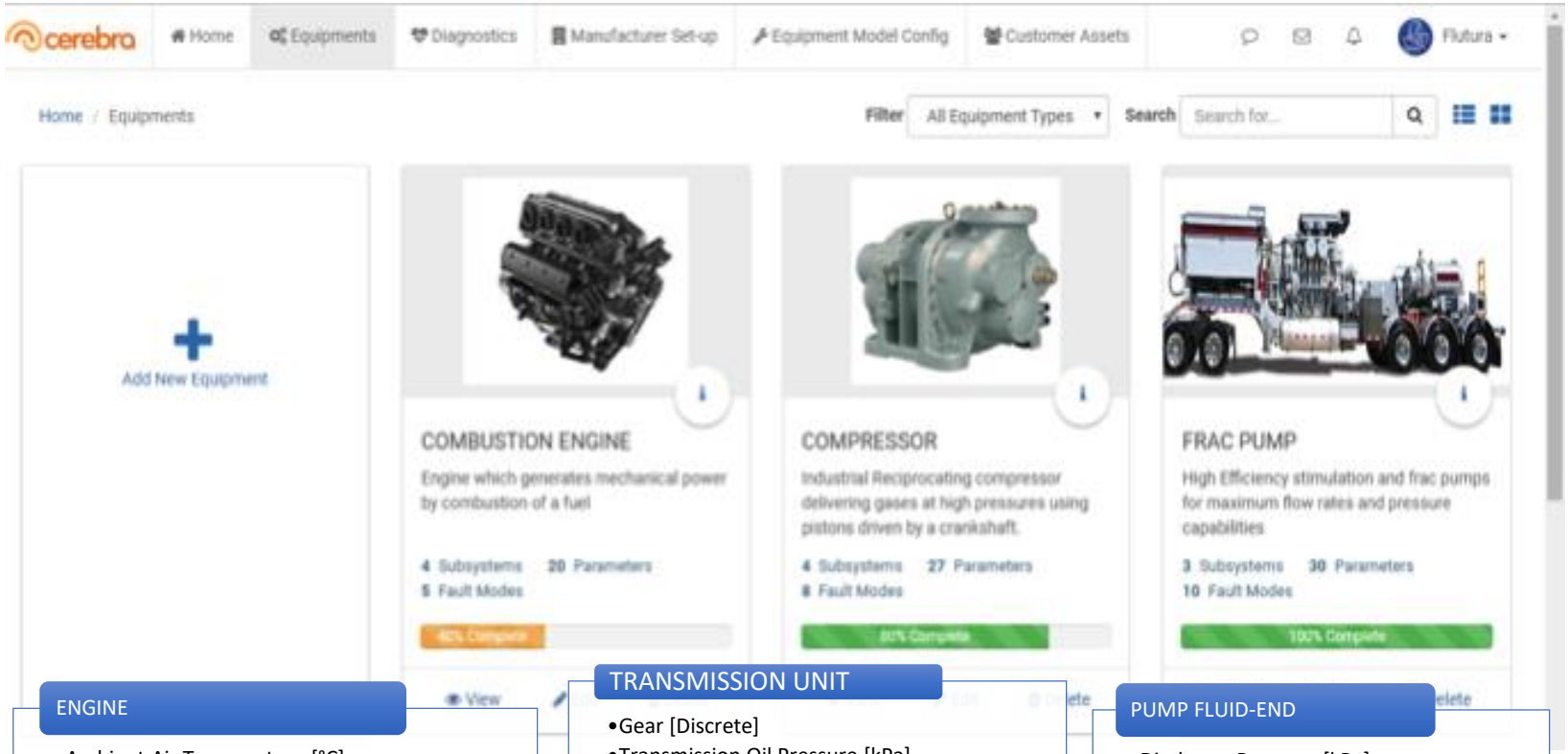
Hydration System

Increase Productive Time

Reduce Operating Cost

Prevent Inappropriate Equipment Usage

Flutura Digital Twinning - Subsystems & Signals



ENGINE

- Ambient Air Temperature [°C]
- Air Inlet Temperature [°C]
- Alternator Voltage [V]
- Barometric Pressure [kPa]
- Battery Voltage, Switched [V]
- Electrical Voltage [V]
- Engine Coolant Pressure [kPa]
- Engine Coolant Temperature [°C]
- Engine Coolant Temperature Alarm [Discrete]
- Engine Fuel Pressure Alarm [Discrete]

TRANSMISSION UNIT

- Gear [Discrete]
- Transmission Oil Pressure [kPa]
- Transmission Oil Temperature [°C]
- Lockup [Discrete]
- Requested Gear [Gear]
- Transmission Current Gear [Gear]
- Transmission Filter Alarm [Discrete]
- Transmission Hours [Hours]
- Transmission Oil Pressure Alarm [Discrete]
- Transmission Oil Pressure Trip [Discrete]
- Transmission Oil Temperature Alarm [Discrete]
- Transmission Oil Temperature Trip

PUMP FLUID-END

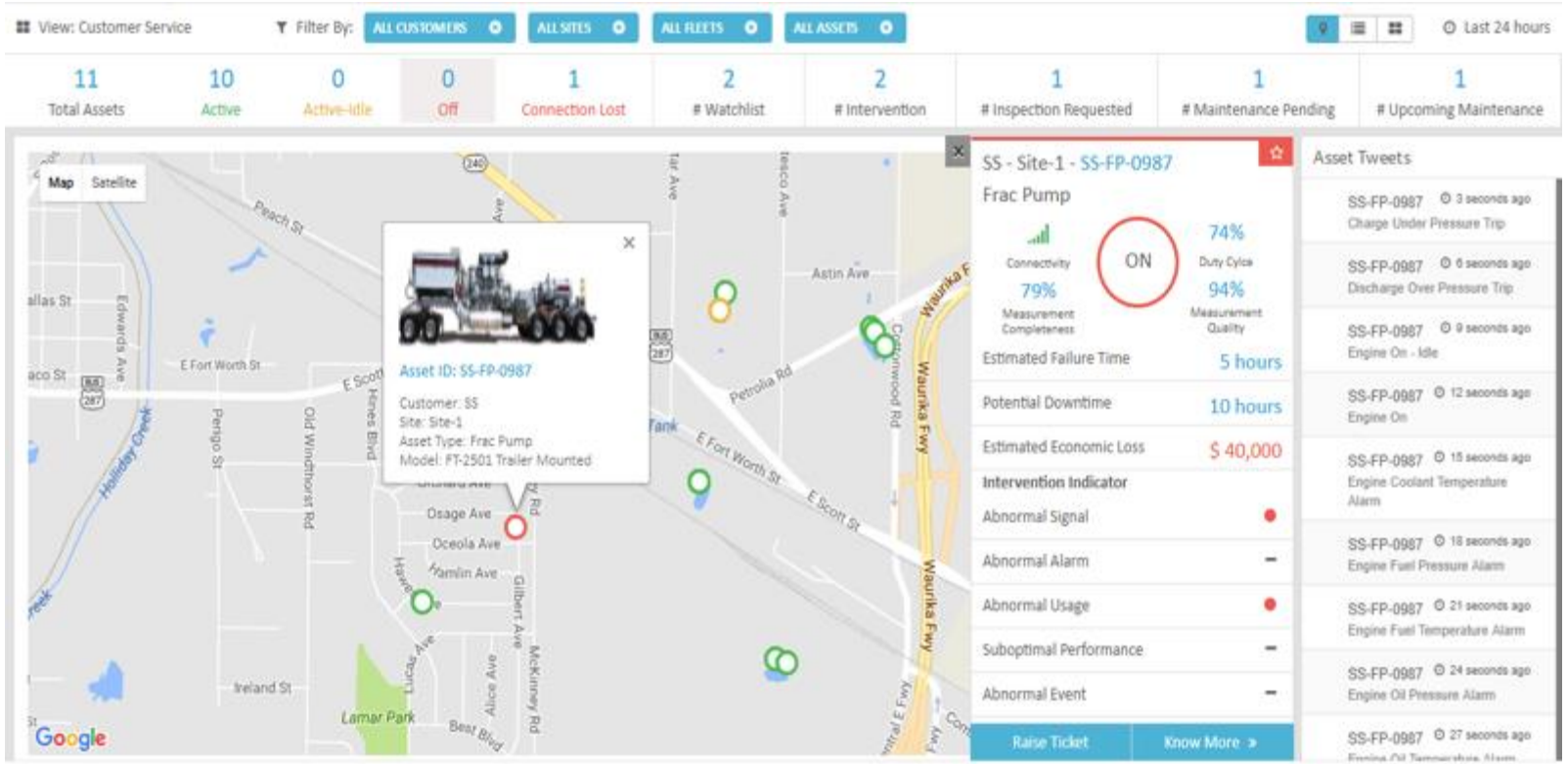
- Discharge Pressure [kPa]
- Discharge Rate [L/min]
- Hydraulic Power [kW]
- Pump Charge Pressure [kPa]
- Charge Under Pressure Trip [Discrete]

PUMP POWER-END

- Pump Lube Oil Pressure [kPa]
- Pump Lube Oil Temperature [°C]
- Pump RPM [RPM]

- Sophisticated and easy to use wizards for new equipment onboarding
- ISO Compliant Taxonomy
- Robust Universal Machine Model to reflect real world assets and contextual information
- Ability to capture design characteristics and sensor metadata easily
- Ability to model variances to individual operating Assets

Flutura Algorithmic State Assessment



- Asset Health scoring algorithm to assess health based on diagnostics tests configured
- Advanced user experience framework for a fast paced operating environment
- Sophisticated notification framework – Asset Tweets
- Security and access control at all levels

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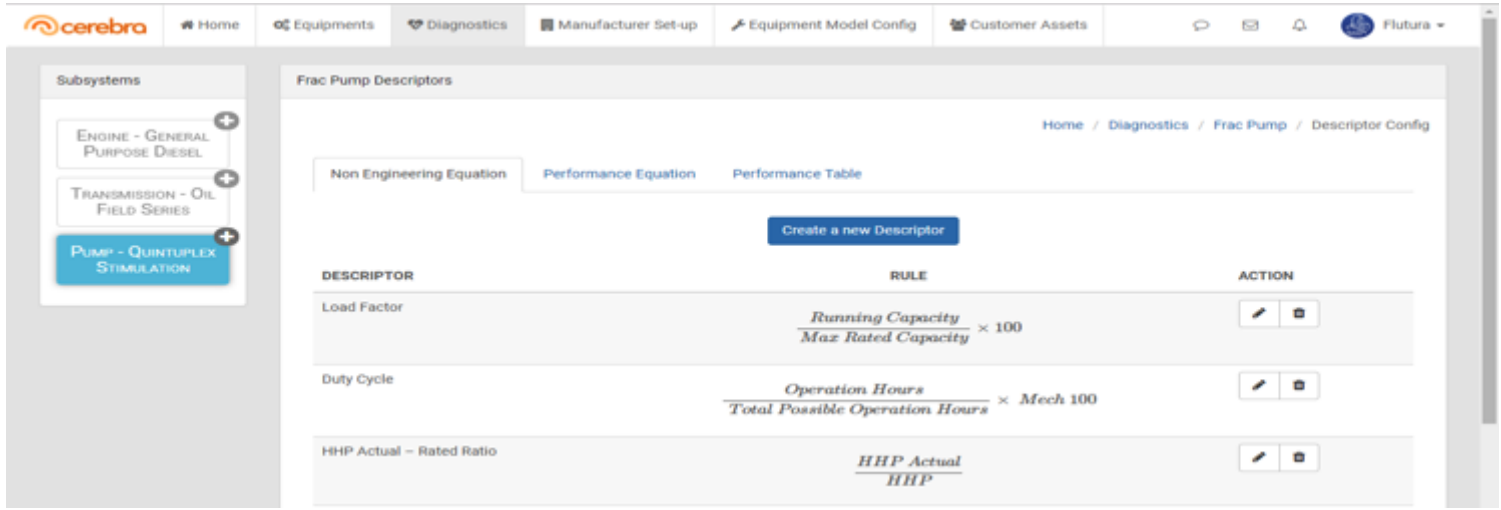
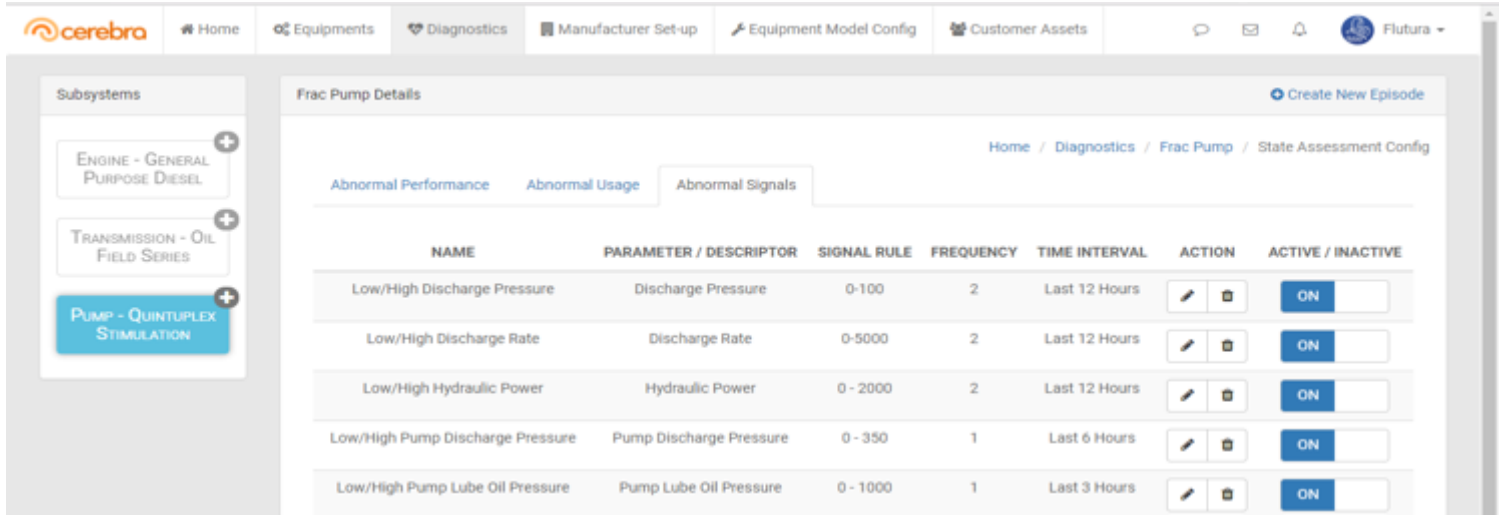
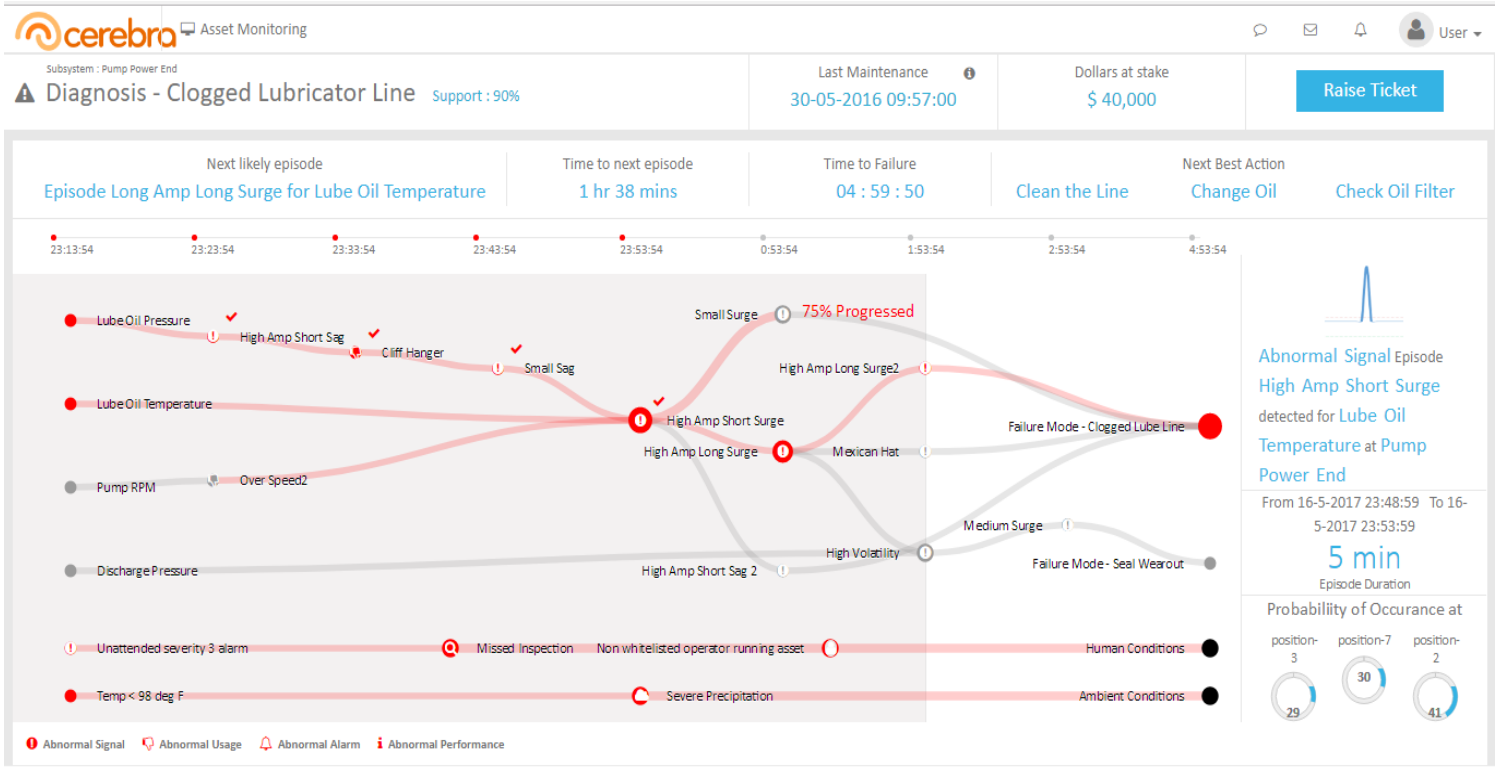
Diagnostics with Physics + Heuristics + Statistics





- Wizard based diagnostics test creation workflow
- Ability to create engineering or first principles based diagnostics tests
- Ability to enable engineers to tune screening, sensitivity and specificity of diagnostics tests via heuristics or experiential knowledge
- Prebuilt machine learning and statistical based anomaly detection algorithm
- Ability for engineers to fine tune sensitivity of tests

Prognostics - AI Based Framework



- Machine learning based symptom ranking
- Auto factoring of impact of maintenance, fault events, ambient conditions on symptoms
- Machine learning framework for automated disease model / fault signature construction
- AI based prognosis models
- Mutually exclusive / conditional probability based prognosis philosophies for triangulation and decision making

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Cerebra Safety 360 App

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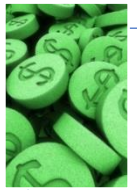
Vision for Goal Zero

Oil & Gas industry has higher standards of safety than any other Heavy Engineering Industry

How do we further sharpen efforts towards Goal Zero

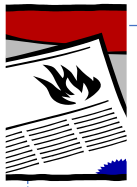
How do we Institutionalize Safety at the Last mile



How to reduce incidence losses of more than $1 Billion

How to further decrease liability budgets– average of $400 Million

Opportunity cost for daily downtime for an average 300,000 BPD site can go up to $40 Million per day



How to further reduce spend on Insurance Premiums

Key Data Sets for Safety 360 Solution

Contractor
- Training
- Experience
- Personal Background
- Working Hours

Equipment
- Machine Type
- Operating Environment
- Failure Events

HSE Control Framework
- Safety Audits
- Compliance
- Risk Track
- Safety Profile

Project
- Location
- Weather
- Duration
- Life Stage
- Economic Value

Fountain Incident Management System
- Unplanned Events
- Near Misses
- Incidents with Consequences
- Potential Incidents
- Third Party Incidents
- Impact of Incidents
- Rules

Safety 360º
What,
When,
How, Why?

"Blind S nal
Data ne uired

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Cerebra Next Level

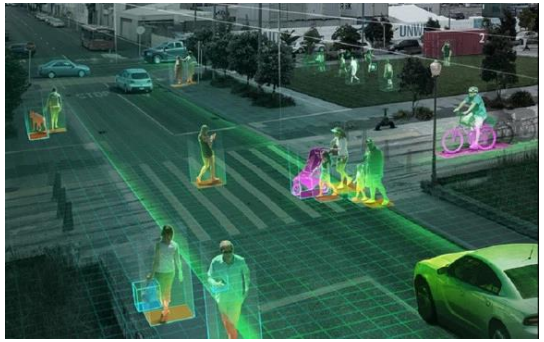
Cerebra is making the future a reality

“Siri for Industrial world”

Reliability Engineer in your pocket

Diagnose equipment health

Speak or Text the Asset



Video Analytics HSE Events

Personnel in Hazard Zones

Missing PPE

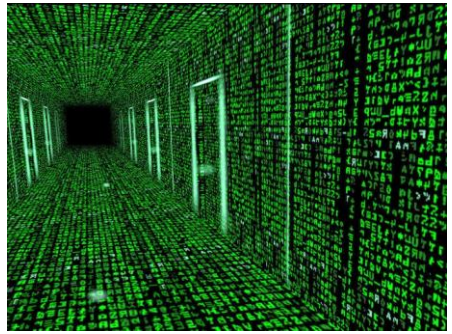
Missing handrails

AR/VR model

Remote Troubleshooting

Engineering models

Symptom



Deep learning AI

Anomalies humans can’t see

Mega Data

Algorithms

Customer's Voice

Chris Harvell
CTO, Stewart and Stevenson

"Flutura Data Sciences and the Cerebra Platform has provided a technology base that allows us to quickly build solutions to meet the growing needs and requirements of our customers.

Working with the team at Flutura we are able to deliver actionable intelligence to our customers that provides intrinsic value and improves our customer's overall operations.

After reviewing many different offerings from a range of IIOT providers, the solutions from Flutura provide the best path forward to leverage technology for increasing revenue, reducing cost, and extending our reach to our customer base"

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Built on Trust
Made to Perform

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