



OPERATIONAL DATA DRIVEN MACHINE LEARNING APPLICATIONS

CAPITALISING OPERATIONAL DATA

AGENDA

- + **Capula**
- + Data Science – What you need to know
- + Getting Started
- + Use Cases developed for SEP
 - + Sub Station Alarm Management
 - + Root Cause
 - + Clustering
 - + Neural Network
- + Conclusion Q&A

50 YEARS OF TRUSTED INNOVATION

SUPPORTING CRITICAL NATIONAL INFRASTRUCTURE ACROSS THE ENERGY VALUE CHAIN

WHAT WE'RE KNOWN FOR:

- Leading systems integrator for over 50 years
- Systems Integration should deliver more than control & Visualisation methodology
- It should ensure interoperability , cyber security across the control layers and capitalisation of operational data
- We aim to be vendor agnostic leading our customer engagements with our deep engineering know-how
- We are focused and committed to supporting the future energy system in the pathway to net-zero



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CAN A MACHINE THINK LIKE A HUMAN

I am not a Data Scientists (DS), but have work with some big hitters

Data Science cover all the considerations, Artificial Intelligence, Machine Learning, Deep Learning

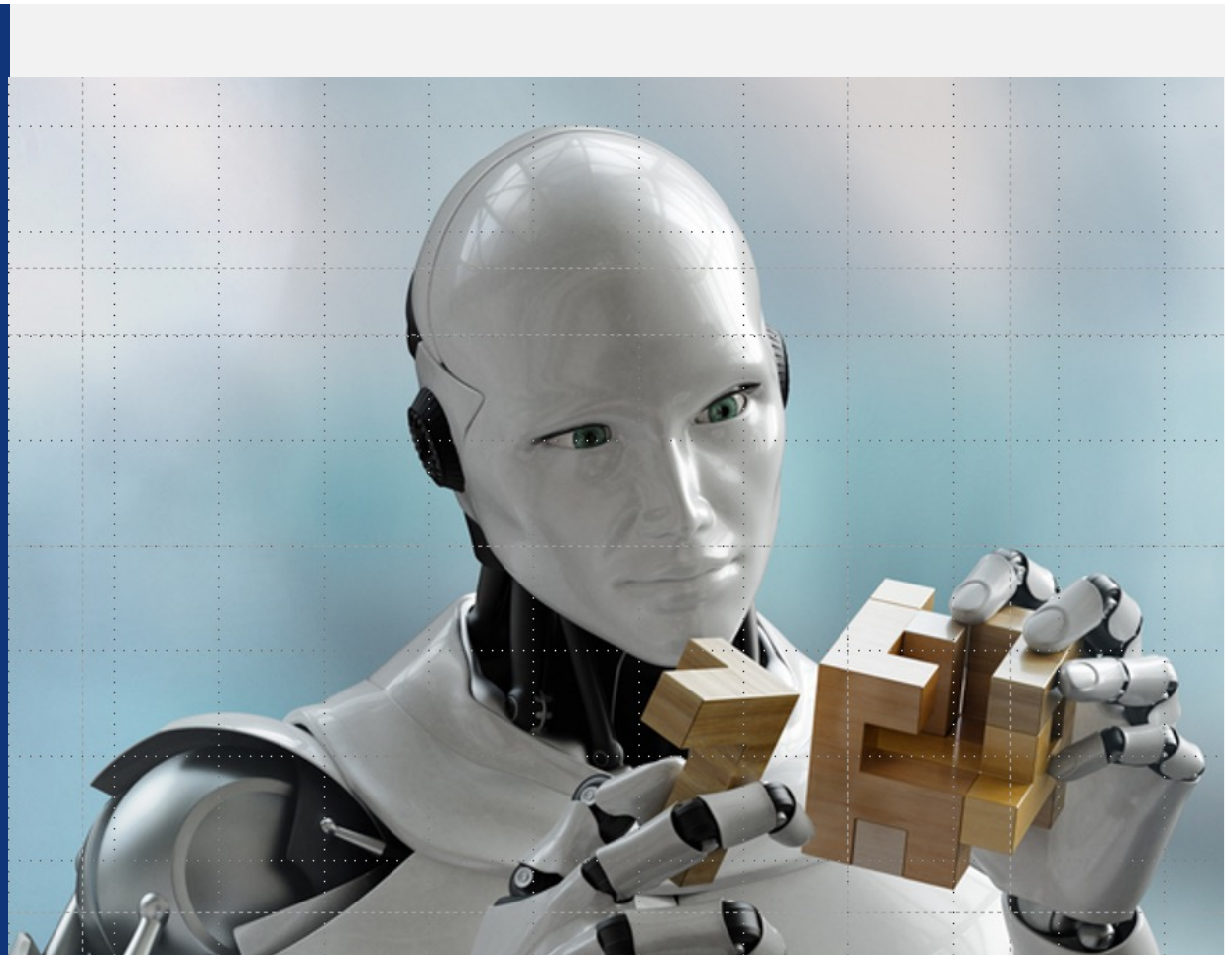
Want to share some key lightbulb moments:

- Data Science is math's based

- The more 'good' data you have, the better

- When developing a DS model 80% of the effort is consumed in data preparation

For DS to be successful (and notice I didn't say useful) it needs good data quality, quality algorithms and a cross functional team



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1 Data Historian/Real Time SCADA Data



2 Naming conventions & Standardisation



3 Parts, Assets, Hierarchy & Contextualisation



4 Visualise & Analyse



5 Outcomes & Reports*



* Digital Transformation

1

Outcomes & Reports *



2

Visualise & Analyse



3

Structure & Contextualisation



4

Naming conventions & Standardisation

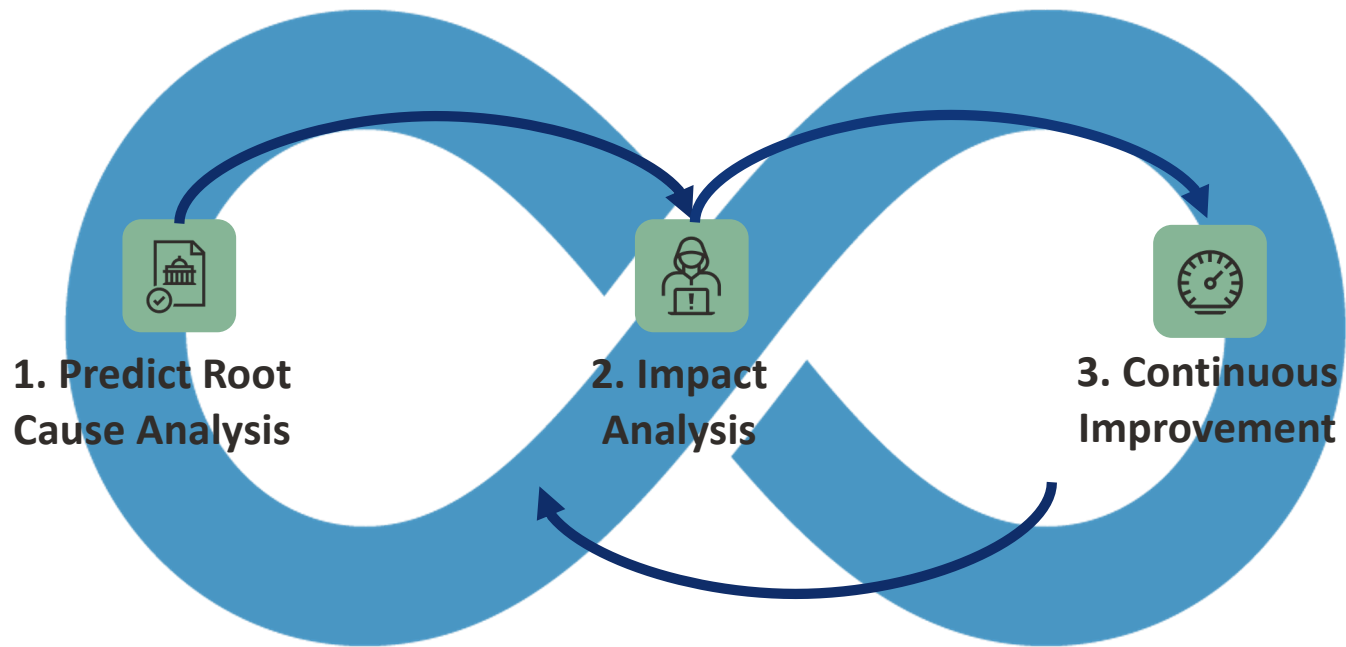


5

Data Historian



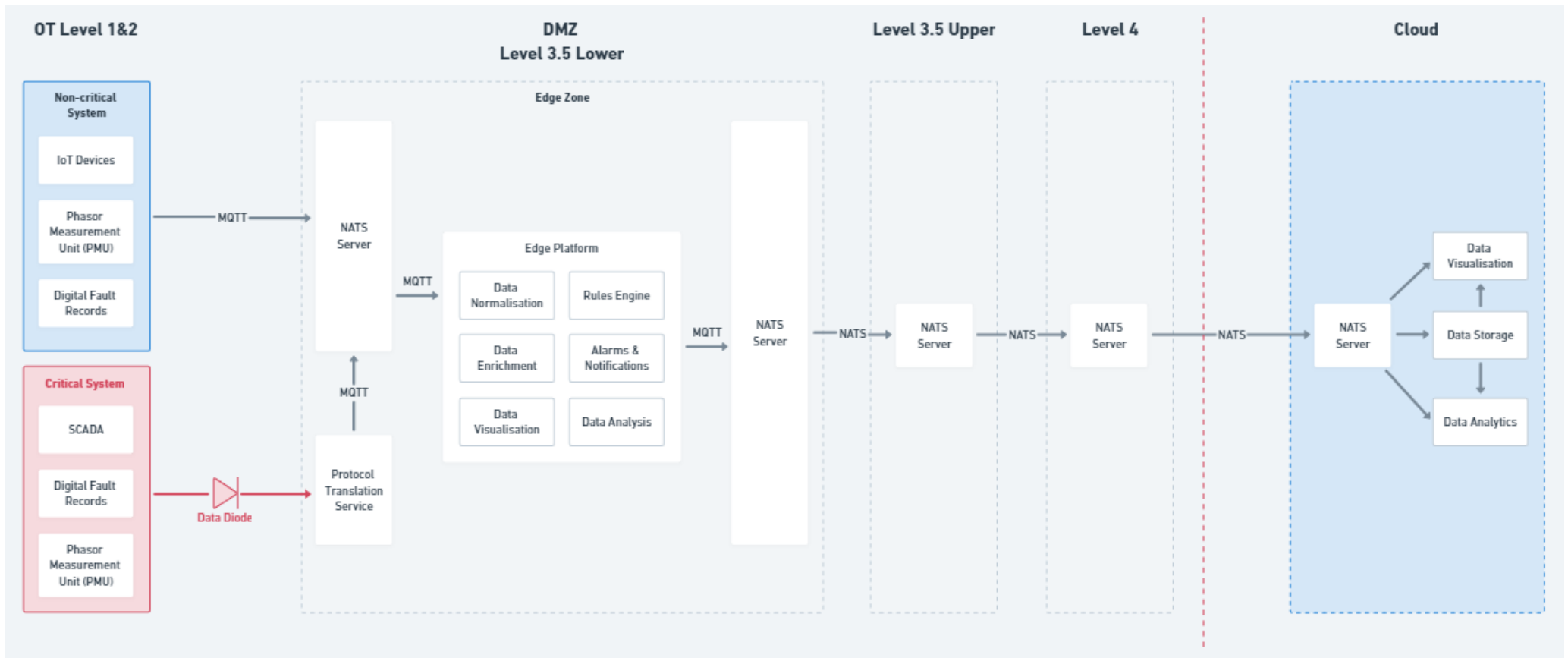
* Digital Transformation



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- + Capula
- + Data Science – What you need to know
- + Augmented Analytics lifecycle
- + **Use Cases developed for SEP**
 - Sub Station Alarm Management
 - Root Cause
 - Clustering
 - Neural Network
- + Conclusion Q&A

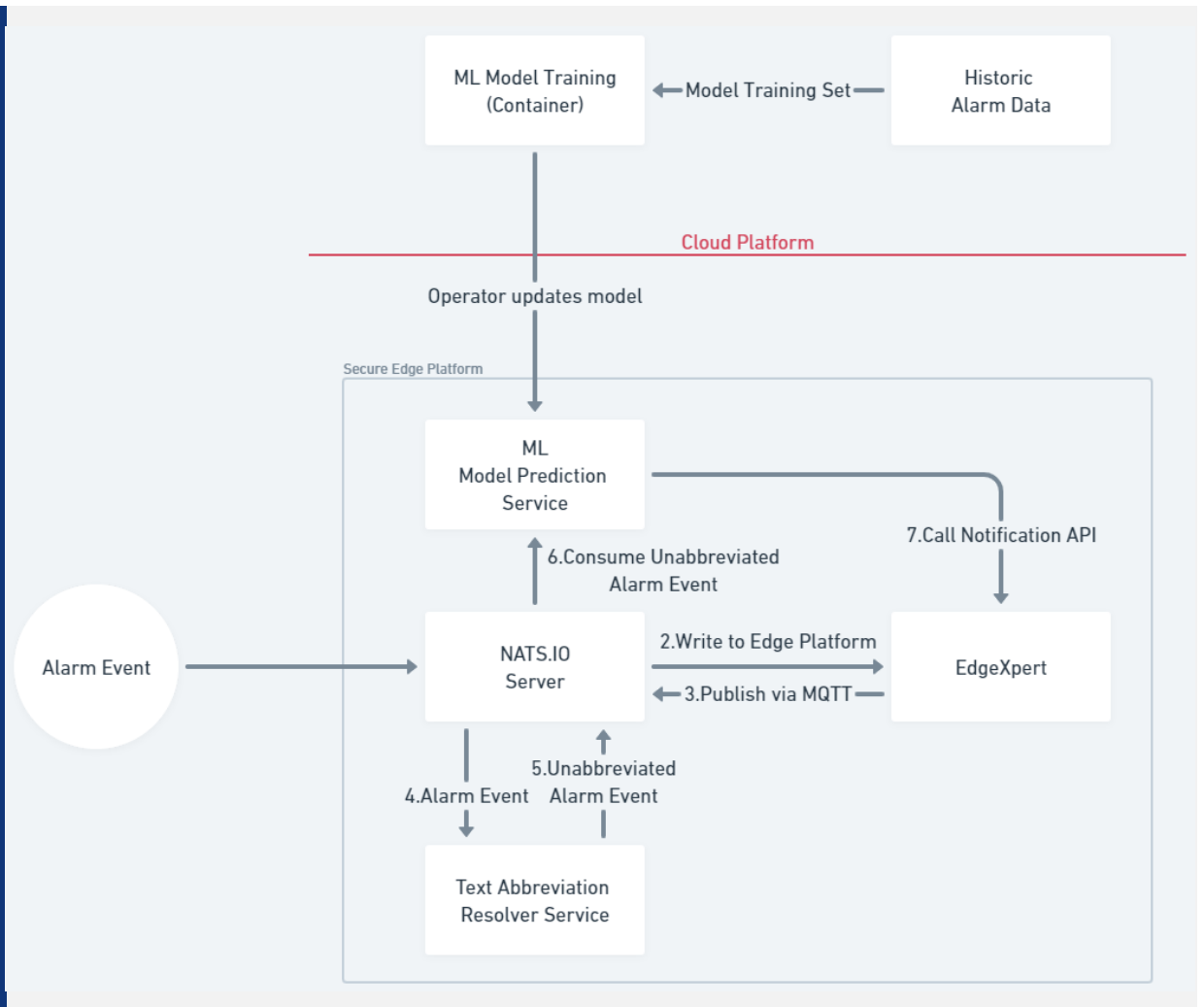
SECURE EDGE PLATFORM



USE CASE

Alarm Root Cause Analysis

Intention is to analyse normalised alarm events for patterns within alarm sequences, determining if they stem from a common root cause. Suppose a single alarm triggers multiple secondary alarms. In that case, the system can consolidate them into a single alarm upstream, resulting in decreased maintenance and observation efforts and faster insight into the underlying issue.



The Process

The ML development process typically involves the following steps:

- Problem Definition
- Data Collection
- Data Preparation
- Model Selection
- Model Training
- Model Evaluation
- Model Testing
- Model Deployment
- Model Maintenance
- Iterative Process