

# Introduction to Centrica

- Supplies energy to around 28 million customer accounts
- Deliver innovative products to customers globally for connected homes
- Distributed Energy & Power is developing integrated energy solutions for commercial and industrial customers
- Energy Marketing & Trading operates in LNG trading optimisation and risk management
- Exploration & Production delivering energy supplies



## SNAPSHOT OF CENTRICA'S 2015 FINANCIAL RESULTS

**£1.459bn**  
adjusted operating profit



Customer-facing  
energy & services  
operating profit up  
**19%**

**£1.5bn**  
re-allocation  
of resources to  
customer-facing  
businesses over  
the next 5 years

**£294m**  
tax bill

Total gas and liquids production  
**78.6mmboe**



Around  
**39,000**  
employees  
worldwide

**28.4m**  
total customer  
accounts

EPS  
**17.2p**

**£28bn**  
revenue

Net debt  
**£4.747bn**

Operating cash flow  
**£2.253bn**

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# Creating a new operational model for data management

Mark Miller  
Chief Product Officer

Io-Tahoe

The logo for Io-Tahoe features the text "Io-Tahoe" in a white, sans-serif font. A light blue, hand-drawn style swoosh underline is positioned beneath the "Io" portion of the text.

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A scenic view of a lake with a forested shoreline and mountains in the background. The water is a deep blue, and the sky is a lighter blue. The shoreline is covered in dense evergreen trees. In the foreground, there are several wooden piers extending into the water. The mountains in the background are covered in snow and partially obscured by clouds.

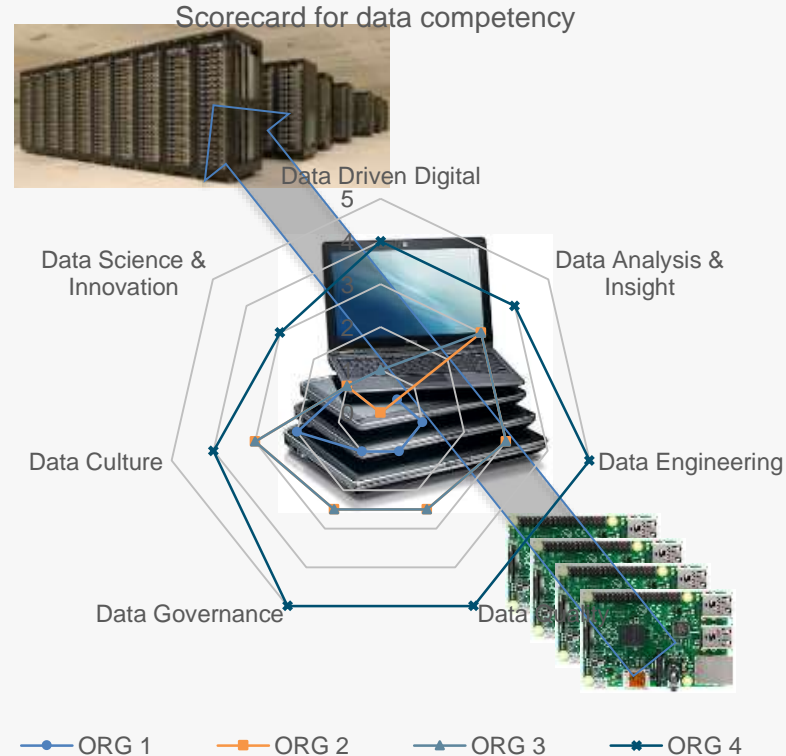
# Data management and data science

Io-Tahoe

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# Data Lake & HDP drove data science and innovation

- Did not solve just a cost and resource issue of exploding data from IoT and digital transformation
- Created innovative and attitudinal change towards data
- Created a new operational model by delivering Io-Tahoe to provide smart data discovery
- Created data science capability to extract maximum value from the data

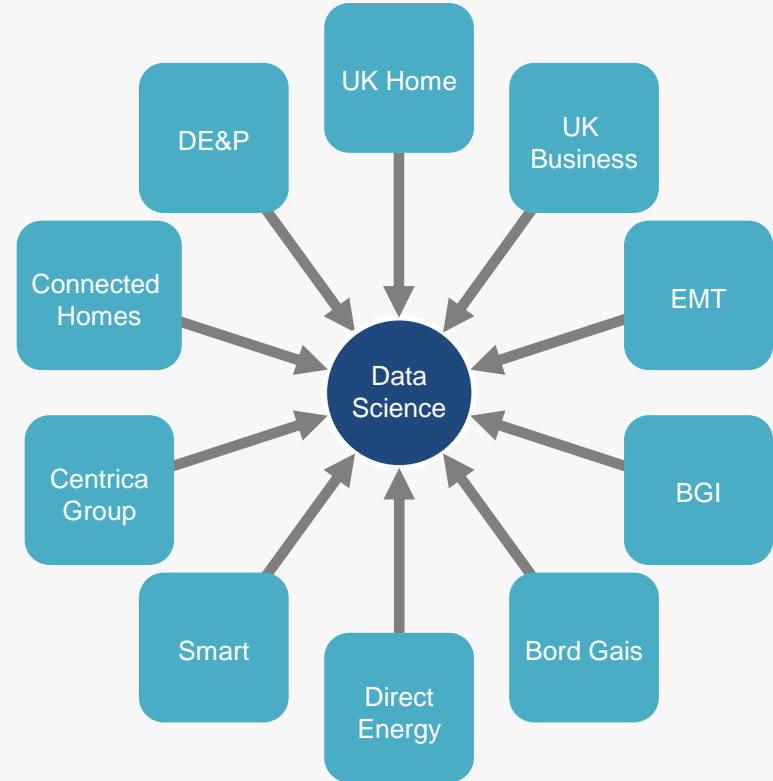


# Data science provides knowledge from data

- Data science augments traditional statistical analysis with techniques like machine learning, natural language processing and data visualisation
- Explores IT and technology related hypotheses. For example, predicting device failures, understanding why smart meters stop working and big data problems
- Use data and data science techniques to develop innovative products such as Io-Tahoe
- Collaborate on business driven projects and act as a hub for knowledge, best practise, and research

## The Team

- PhD Machine Learning
- MSc Data Science
- Experienced Developers
- Graduate Scheme
- Year In Industry
- Apprentice
- Domain Expertise



**RokittAstra** provides smart data discovery for structured databases

Founded in August 2014

**Io-Tahoe** was created in 2013 by Centrica for smart data discovery for internal data lake projects

Acquired assets of **RokittAstra** in May 2017



**Io-Tahoe LLC** is a wholly owned subsidiary of Centrica plc

**Io-Tahoe** creates a new unique operating model for data management. It allows both business and IT to build, innovate and deliver on their information objectives in an agile and governed way



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Creating a new  
operational model for  
data management

Io-Tahoe



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# What is Io-Tahoe solving?

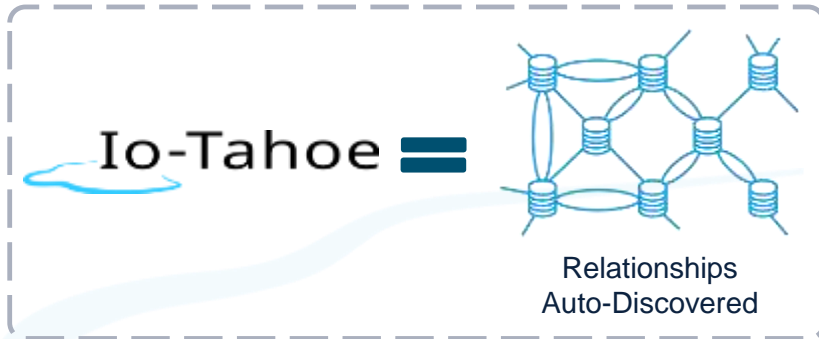


Huge opportunity





## WE ARE



POWERS

## WE ARE NOT

DATA ANALYTICS  
DATA VISUALIZATION  
BUSINESS  
GLOSSARY  
DATA  
QUALITY  
BIG DATA  
MANAGEMENT

## ALTERNATIVE



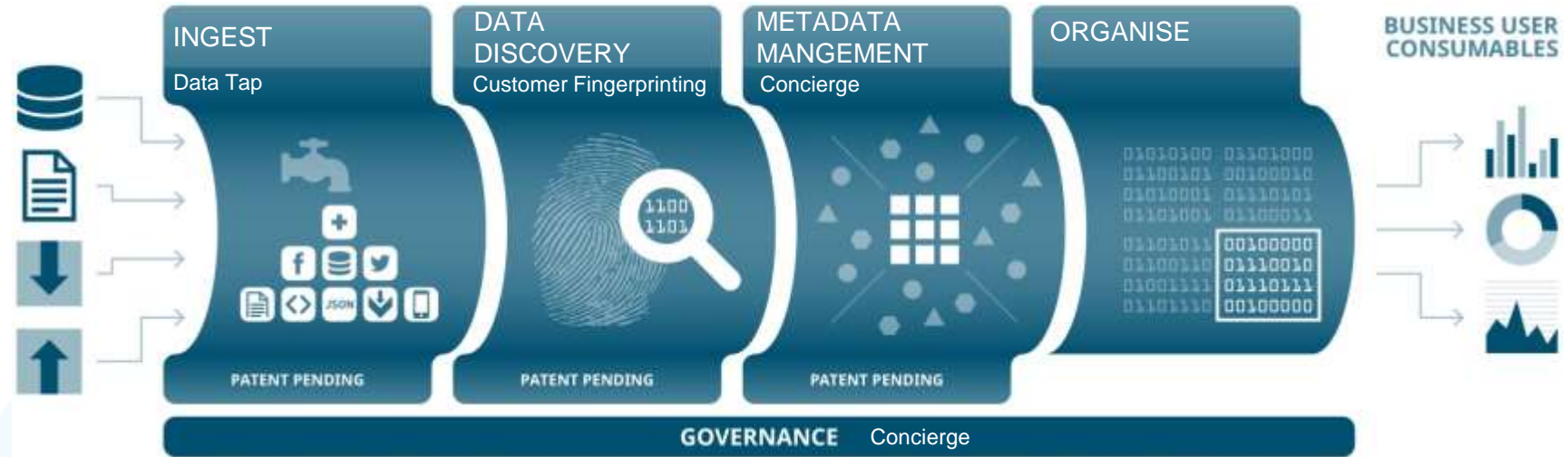
Manual  
Discovery



Unknown, broken  
relationships

POWERS

# What is Io-Tahoe?



Building the Data Lake	Create high definition view of the Data Lake	Empowering the business with data	Deliverables to enable business
Adaptive Ingest	Smart Discovery	Self-Service	Data Knowledge, Queries, Data Flow
Config not development	Reduce time	Team Sport	Export
Complexity	Find new relationships	Search your business	Data Science SDK

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# Business Outcomes

Io-Tahoe

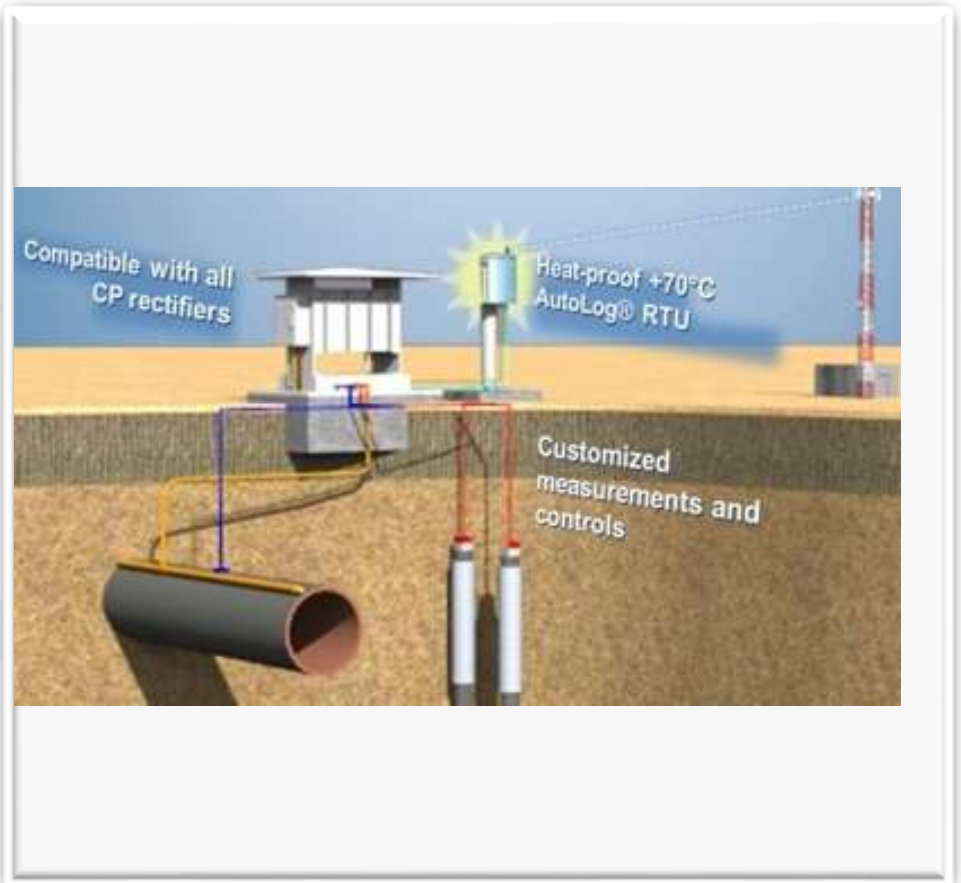


## Challenge

- 15,000 cathodic pipes spread across Netherlands
- Overtime, sporadic engineers monitor
- Inefficient and lack of information

## Solution

- Using Sensors able to measure multiple factors, GPS, accelerometer, humidity and electric current through IoT
- Collect semi real-time data into a data lake
- Using Io-Tahoe to create a known data operational model apply data science to create predictive maintenance model
- Potential reduces maintenance by 35%



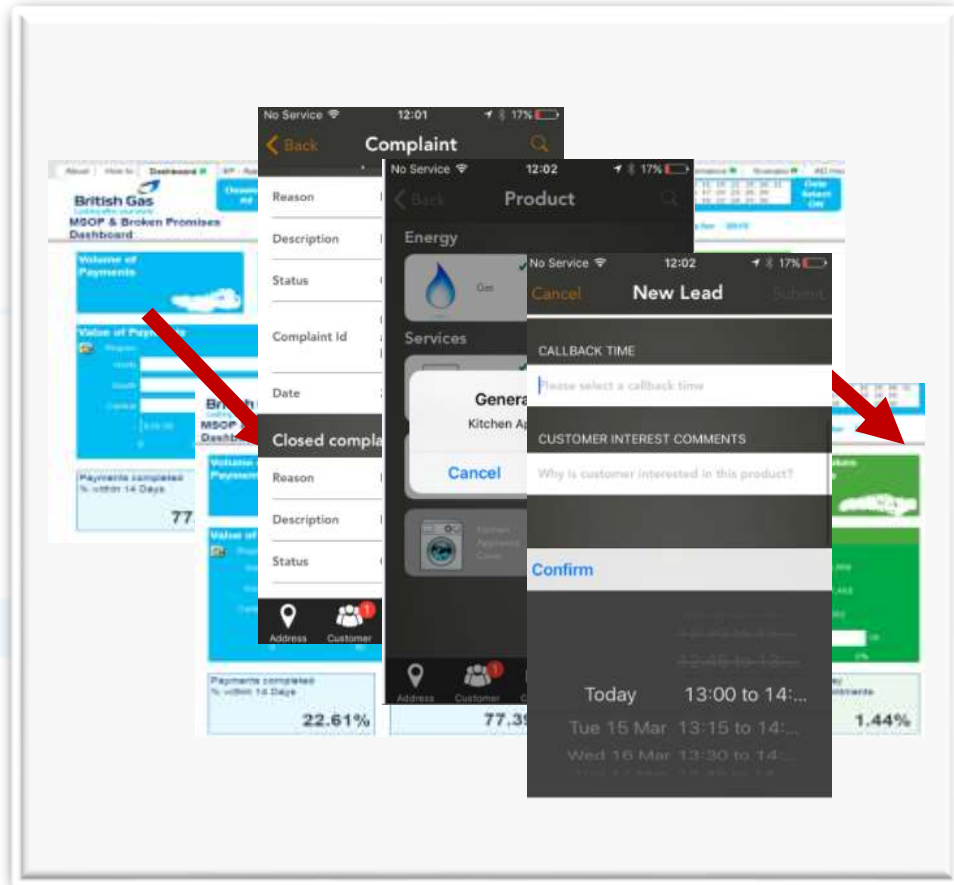
# Revenue assurance through accurate insight

## Challenge

- Digital transformation of field engineers
- More digital data
- Cross-sell of the services

## Solution

- Collect data across various data, product, services, field sources into data lake
- Apply data science and visualization to data
- Broken promises was born
- Significant cost savings (£M)



## Challenge

- Well-known media company had electric bills that could not be measured and high cost of operating cabinets - £51M

## Solution

- Added Panoramic Power wireless self-powered sensors to 41,000 cable boxes
- Ingested data into Centrica's data lake and used Io-Tahoe to create an accurate view of financial, customer and location data
- Using data science capability we were able to establish:
  - Known electricity consumption
  - Retain and gain customers through predictive maintenance reducing complaints and incidents
  - Insight to using batteries as virtual power plant off-grid



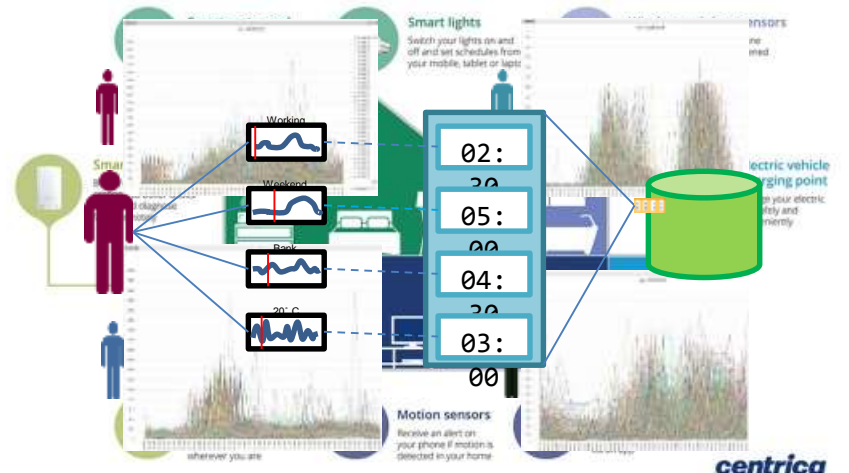


## Challenge

- Extract value from new data sources of smart meters and smart appliances in the home

## Solution

- Using data to allow detailed profiling of customer behaviour and consumption
- Increase customer acquisition and retention through tailored tariffs and offers to existing and new customer
- Incremental revenue



# Vision for an integrated Virtual Power Plant

## Challenge

- How to provide value and offers to customers as they evolve from consumers to suppliers?

## Solution

- Provide supply predictions for smart businesses and homes
- Collect and ingest data into data lake and use Io-Tahoe to get a known data model
- Combine data with grid supply payment method to create virtual power plant for Grid
- Gain new customers -> Revenue

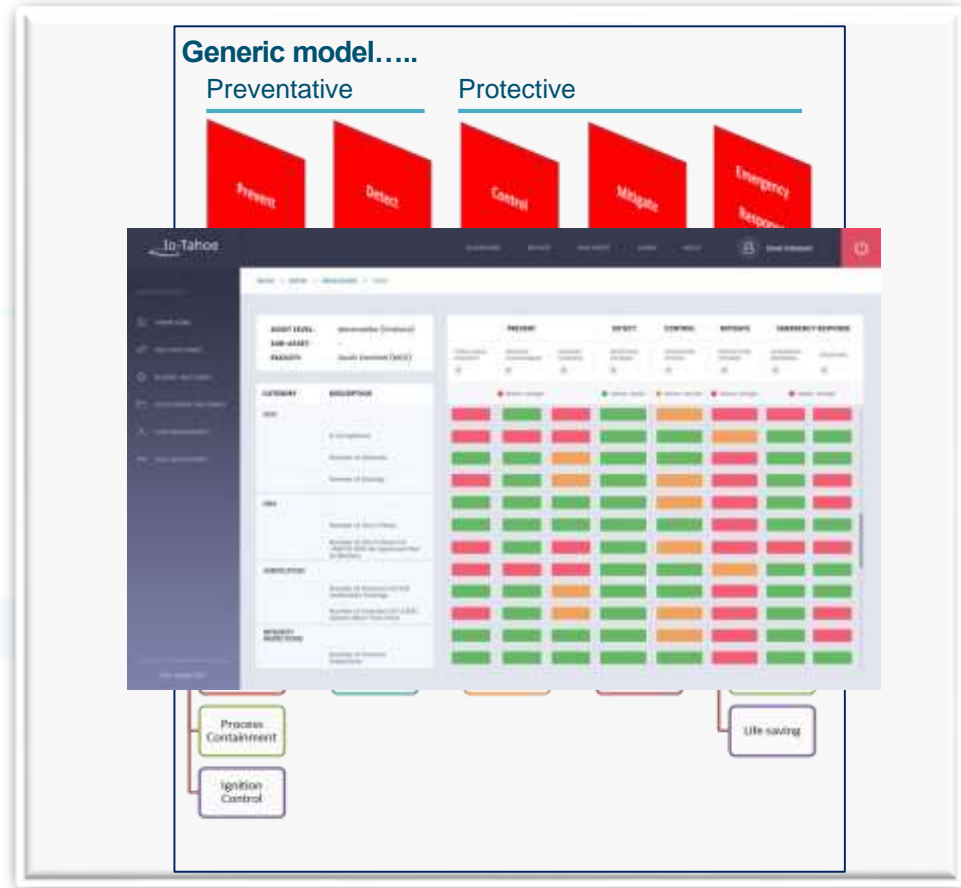


## Challenge

- Multiple data systems with no shared vocabulary
- Live barrier level insight for operational leaders

## Solution

- Near live barrier level insight by:
  - Using Io-Tahoe continuous ingestion into Hadoop data lake, smart data discovery and governed metadata management
- Using data science identified trends and correlations to adjust rule-sets
- End-result is better accident event management leading
  - Better know risk and expense
  - Lowering risk to brand reputation

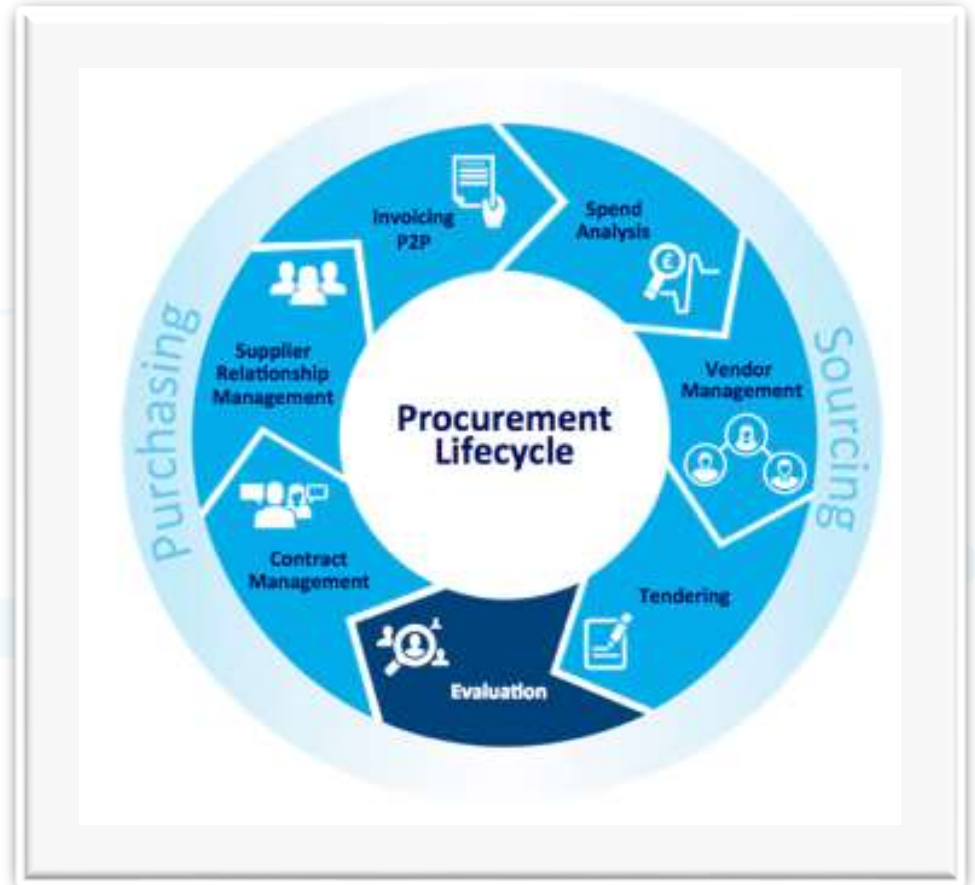


## Challenge

- Enable procurement to identify, minimise and manage risk of suppliers
- Suppliers are compliant with corporate social responsibility values

## Solution

- Ingest diverse data sources across the business as well as Dun & Bradstreet risk data into data lake
- Use Io-Tahoe to create data knowledge base using data discovery and metadata management
- Visualize the risk-based suppliers reducing expense exposure and reputational damage
- Data science created predictive model for ethical and risky suppliers



**Those who thrive in this digital economy will be the organisations that turn information into a competitive advantage**







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