Monday 11th November 2019

Big Data Beats Beast from the East

Welcome

Bob Taylor
CEO, Portsmouth Water
Welcome and opening

- Storm Emma in 2018 resulted in a major freeze-thaw event that affected water supplies in large parts of the UK – including some 200,000 with prolonged interruptions to supplies.

- Today’s event brings together experts in the field of data science to explore how the sector can better utilise information and data to predict, prepare and respond to future events.

Structure for today

- Agenda:
  - Series of speakers to share their views and thoughts
  - Opportunity to network and contribute from the audience
  - Use the #bigdataswater19 to share with your online communities

- First session until lunch with afternoon coffee break
- We also hope you can join us for drinks as the event closes.
Take aways

• Today isn’t about a series of presentations and talks
• .... Its about stimulating your minds, generating ideas and providing thoughts to take back to your offices and workplaces
• There is no doubt the sector has addressed the challenges from 2018 but more needs to be done
• Big data is part of the jigsaw – you can take it away and fit it in

Agenda

Session 1: 10 to 10.45 - Welcoming remark and key notes – Bob Taylor, CEO, Portsmouth Water
Session 2: 10.45 to 12.30 - “Harnessing the power of latest technologies to maximize the use of Big Data “ – hosted by Mike Bishop, Director of Operational Services, DCWW
Session 3: 1.15 to 2.45 - “Defining the state of the possible: customer engagement, predictive analytics, and Digital Twins” – hosted by Fred Royan, Global VP Research in Sustainability & Circular Economy – Industrial, Frost and Sullivan, representing SWAN Forum
Session 4: 3.15pm to 4.15pm - “How data-enabled open innovation can solve real-world problems”- hosted by Leigh Dodds, Director of Advisory, Open Data Institute
Session 5: 4.15 to 5pm - Summary and wrap up - Bob Taylor, CEO, Portsmouth Water.
Shared and open: the value of increasing access to data

Leigh Dodds
Director of Advisory, The ODI

Leigh Dodds
@ldodds
theODI.org
The team

Dr Jeni Tennison
CEO

Louise Burke
COO

Sir Nigel Shadbolt
Chairman

Sir Tim Berners-Lee
President

Founded in 2012, the Open Data Institute (ODI) is an international, independent and not-for-profit organisation based in London, UK.

Vision

We want a world where data works for everyone.

Mission

We work with companies and governments to build an open, trustworthy data ecosystem.
Sector programmes

We coordinate organisations to tackle a social or economic problem with data, using an open approach.

Open data is data that anyone can access, use and share.

ODI definition of open data
Also see: https://opendefinition.org/
Combining data to create insight
Combining data to create insight
Combining data to create insight

Data provides context and improves decision making
data is infrastructure

Our theory of change

How value is created from data
Our theory of change

Scenario:

What happens when we fear data – the wasteland

https://theodi.org/service/data-ethics/
Our theory of change

Scenario:

What happens when we hoard data – the oil field
A manifesto for sharing engineering data

- Increasing safety by monitoring and improving working conditions
- Increasing productivity in construction and engineering
- Enabling open innovation across the sector


THE VALUE OF DATA SHARING FOR THE PRIVATE SECTOR

£150k

For up to 6 projects
Any type of organisation - world-wide - is eligible for funding

value

**Thomson Reuters**
A collaborative open data platform

**Arup**
An ecosystem of open innovators

**Syngenta**
Publishing open data and creating an open approach


THE VALUE OF DATA SHARING FOR THE PRIVATE SECTOR
THE VALUE OF DATA SHARING FOR THE PRIVATE SECTOR

Patterns for data-enabled innovation

Open data for...

1. Better access to public services
   - Direct beneficiaries: Citizens, Businesses
   - Decisions/actions taken: How and where to access public services
   - Information produced: Targeted service information
   - Types of data: Open real-time service data

2. More efficient service delivery chains
   - Commissioning
   - Managers
   - Frontline staff
   - Where to prioritise operational resources
   - Insight and patterns
   - Open performance data

3. More informed policy development
   - Public sector workers
   - Elected representatives
   - Where to target policy interventions
   - Data visualisations and analysis
   - Open data about a policy area

Final thoughts

Data exists on a spectrum, from closed to shared to open

Openness and trust are essential to creating positive impact from data.

The Real World – a control room view on data during an incident

Tony Hubbard
Anglian Water
A few photo’s from Anglian Water during Beast from the East.

What is the general impression of how a Water Control room looks?
What is a Water Control Room

• Does it consist of just a few people, lots of large desks, lots of screens, spacious area to work?
• A place where we hold data on all previous events which is instantly retrievable for decision making?
• A place where all data is relevant and easy to filter?
• A place where all work loads are consistent and not variable?
• Do all controls room work with a “controlling mind” strategy?
• Are the 10 WaSC’s control rooms all similar and work in the same way?

No
What are the challenges a Water Control room face?

- Retrieving data
- Telemetry asset alarms vs events
- Not having one core set of data that others can use
- People still keeping their local data
- Consistency with internal communications
- Operating with a standard process for recording of data
- Attracting the right people
- Being accepted/respected by local field teams
- Constantly being challenged on decisions

What are the challenges a Water Control room face in events like Beast from East/high summer demand?

- Contacting people
- Prioritising work with limited staff
- Getting our own staff into control rooms
- Inconsistency in accessing most appropriate data
- Knowing what data is available
- Utilising IT for remote working
- Wellbeing
- Identifying the appropriate vehicles for the field teams
- Sharing of information
- Extra employees from other teams not sharing data/knowledge.
- Fatigue from key staff
- Too many weather forecasting channels

https://1drv.ms/v/s!AnesTZgSK40g5sV1FYCd7eXPmBi6g
Main activities we cover in Anglian Water’s Tactical Operations 24/7 function?

- Controlling Mind for operational events.
- Water
  - Water Quality at WTW’s & in water distribution Network
  - Burst Mains (Restoration, Repair, Alternative supplies, Hydraulic Modelling)
  - Proactive customer communications
  - Identify resolution of Asset failures
- Water Recycling
  - Compliance at WRC’s & in sewer Network
  - Burst pumping Mains (Repair, over-pumping, Tankering)
  - Resolution of sewer blockages
  - Proactive customer communications
  - Identify resolution of Asset failures
- Asset Alarm Management (Telemetry alarm system contains over 750,000 points)
- Escalation point to higher level Incident room events
- Deploying work to field staff outside normal working hours.
- Point of contact for blue light services
- Lone Worker management
- Overview of working hours compliance
- Point of contact for anything out of hours

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Topic areas identified by Water-CRF members for future forum focus?

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<thead>
<tr>
<th>Percentage of votes</th>
<th>Description</th>
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<tr>
<td>2%</td>
<td>Increase lines of communication.</td>
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<td>Managing OT within water industry.</td>
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<td>Managing mains cleaning/conditioning and making it BAU.</td>
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<td>Remote control from the control room.</td>
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<td>Impact NI8/CAF and how water industry is dealing with this challenge.</td>
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<td>Automation of control room activities.</td>
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<td>Network modelling in control rooms (supply and waste).</td>
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<td>Integration of logger data from leakage and DMAs; how do companies integrate?</td>
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<td>10%</td>
<td>Increasing value by reducing non-control room activities.</td>
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<td>13%</td>
<td>Technology to deliver control centre of the future.</td>
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<td>25%</td>
<td>Knowledge capture, management and maintenance.</td>
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What type of data do we use in a control room

- GIS
- Customer information
- Situational awareness data
- Telemetry
- Hydraulic Modelling
- Response & recovery plans
- Employee contact details
- Historic events/actions
- Predictive workload forecasting
- Weather forecasts
- Lone Working
- Quality data
- Vehicle trackers
- Site Operating manuals
- Approved procedures and processes

Why are we interested in near & real time data in a control room?
A few comments on data & knowledge that W-CRF attendee’s highlighted need to be future topic areas.

- Lots of fragmented/bespoke/standalone systems – don’t all talk to each other. No consistency. Aim for apps to join systems together. Need to make more and better use of GIS/spatial data.
- Lack of consistency in naming conventions is a big issue. Lacking search function. Mostly individual knowledge and memory – experience dictates where we look for what. GIS visibility is part of the solution.
- People try to share but unstructured data and inconsistency is a barrier. Information can be difficult to find/retrieve, e.g. paper files, personal spread sheets.
- No common understanding of data requirement
- Global understanding of information provision requirement, push vs pull. A lot could be self-serve.
- Automation/integration – ease data/communications
- Data rich/knowledge poor

Harnessing the power of latest technologies to maximise the use of big data

Hosted by Mike Bishop
Director of Operational Services, DCWW Welsh Water
Theme for the Session

• Data Governance – how we ensure we have the right governed data for our analysis – Justin Doran, DCWW Welsh Water
• Identifying and Progressing Solutions – Hackathons – Michael Wingell, Anglian Water
• Predicting Weather Impacts – Malcolm Lee, Met Office
• Managing asset performance and its impact on customers – Michael Potter, Thames Water
• Understanding Impact on Customers – Mike Bishop, DCWW Welsh Water
The Future

The IBM Blue Gene supercomputer is as powerful as a ZX81 next to a quantum computer

dwrcymru.com

How we ensure we have the right governed data for our analysis

Justin Doran
DCWW
How we ensure we have the right governed data for our analysis

Justin Doran
Data and Analytics Manager (Data Governance)

Big data beats Beast from the East
11 November 2019

dwrcymru.com

Overview

1. Data challenges
2. Data team at Dŵr Cymru Welsh Water
3. Data governance approach
4. Current focus
5. What’s ahead

dwrcymru.com
Governed data is critical in order to predict the impact of, respond to and recover from extreme weather events...

“Good decisions made on bad data, are just bad decisions you don’t know about yet”

- Scott Taylor (The Data Whisperer)

dwr.cymru.com

“The Mars Climate Orbiter Spacecraft was lost because one Nasa team used imperial units while another used metric units for a key spacecraft operation.

The $125m spacecraft should have gone into orbit around Mars on 30 September 1999 but instead burnt-up in the planet's atmosphere.”

- The BBC

dwr.cymru.com

Image Source: www.wikipedia.org
“Volvo’s self-driving car is unable to detect kangaroos because hopping confounds its systems, the Swedish carmaker says.

The company’s ‘Large Animal Detection system’ can identify and avoid deer, elk and caribou, but early testing in Australia shows it cannot adjust to the kangaroo’s unique method of movement.”

- The Guardian

dwrcymru.com
Question posed at the Annual Leakage Conference 2019…

How confident are you that water companies will be able to process the additional information?

- Can't manage the data they already have: 71%
- Could manage a slow steady increase: 19%
- Coping now but will not be able to increase: 5%
- Able to manage as much data as required: 5%

Source: Slido 20th Annual Leakage Conference 2019 (79 Responses)

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Data Team

Director of Operational Services

Head of Data

Data Governance  Data Engineering  Data Migration  Business Intelligence  Data Science

dwrcymru.com
Example: Typical Data Science Project Process

dwrcymru.com
Data Governance Approach

Getting WISER with our data is...

"Getting the 'Right' people
Involved at the 'Right' time
In the 'Right' way
Using the 'Right' data
To make the 'Right' decisions
Leading to the 'Right' solution

To earn the trust of our customers everyday"

Data Domain

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<th>Data Stewards</th>
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<td>Water Quality</td>
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dwrcymru.com
**Data Governance Approach**

**Data Owner**
- Responsible for the trustworthiness of the data, data monitoring and general safeguarding of data
- Final accountability for the data in their domain
- Position of authority helping to set standards and resolve data issues
- Actively promotes data governance

**Data Steward**
- Champion data as a business asset
- Establishing requirements and assessing the quality of the data used across their business domain
- Custodians of data, supporting the interests of the business and IT.
- Will speak up when a decision will not work for their specific data domain

**Current Focus**

**Strategic & Tactical Data Governance**

**Strategic**
- Tackles everything together / completely
- Structured

**Strategic Cons**
- Expensive

**Tactical**
- Targeted on problem areas
- Cheaper

**Tactical Cons**
- Small data maturity improvements
Current Focus

Data Quality Standards
- Data Quality KPIs
- Standard Business Term Definitions
- Classification Standards
- Spelling and naming conventions

System Alignment & Reporting
- Alignment of new and existing applications
- Records Management
- Transactional data standards
- Common coding standards

Master Data Management
- Master data Policies and workflows
- Master data field standards in core systems
- Technical Data Standards
- Reference data management

Strategic Data Governance Themes

What’s Ahead

Management understands and appreciates the role of data governance
Real-time activities and preventive data quality rules and processes

Fragmented → Undisciplined → Reactive → Defined → Governed → Optimised → Holistic

Management→ Dŵr Cymru Welsh Water→ Management

dwrcymru.com
Where does the data come from?

What does the data mean?

Who owns the data?

Can I trust it?


dwrcymru.com

Getting WISER with our data is...

"Getting the 'Right' people involved at the 'Right' time in the 'Right' way using the 'Right' data to make the 'Right' decisions leading to the 'Right' solution to earn the trust of our customers everyday."

Any Questions?

dwrcymru.com
Identifying and Progressing – Hackathons
Michael Wingell
Anglian Water
**Who?**

Anglian Water is the largest water and water recycling company in England and Wales by geographic area. We employ more than 5,000 people and supply water and water recycling services to more than six million customers in the East of England and Hartlepool.

**What?**

We operate and maintain 38,185km of water mains.

We supply 4.3 million customers with high quality drinking water, and collect used water from over 6 million customers across our region.

More than 2 million visitors come to our water parks and recreational sites each year.

**Where?**

Our huge region stretches from Humber to Thames estuaries, from Buckinghamshire to Lowestoft.

**When?**

Our company has been delivering for customers and for the environment for more than 30 years.

**Why?**

Because we love every drop.

And we’re passionate about our people, local businesses and the communities we serve – we support the health and wellbeing of our people, encourage growth and prosperity in our region and we help to future-proof it against the challenges of climate change and a growing population.

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**Big Data - Hackathons**

**What is a Hackathon?**

“An event, typically lasting several days, in which a large number of people meet to engage in collaborative computer programming”
Innovate East

Key Objectives

**Social Purpose**

Today businesses are more than transactional entities. As companies are put under pressure to carefully consider their role in wider society, three sprits will explore how we make real impact in our communities, raise the level of digital skills among young people and address how we become a more sustainable society while lowering costs for our customers.

**Natural Capital**

The environment is everyone’s responsibility and some of the most pressing challenges facing the east of England centre around our natural surroundings. We will be developing practical solutions to change customer behaviour around their use of wipes in the long term and exploring how the relationship between agriculture, water and energy can allow biodiversity to thrive against the backdrop of climate change. As well as this, we will put the question of how we protect our coastal areas looking specifically at plastics, water quality and biodiversity under the microscope.

**Digital Twins**

A digital twin is a digital replica of a physical entity. By bridging the physical and the virtual world, data is transmitted seamlessly allowing the virtual entity to exist simultaneously with the physical entity. There will be billions of things represented by digital twins in the next five years. The water industry is often accused of lagging behind digitally. How can we evolve further to sit at the forefront of this transformation?

**Leakage**

All water companies are dedicated to driving down leaks across their networks and Anglian Water and Essex & Suffolk Water are no exception. We’re already using the most innovative technology to do this, but how can we take even bigger steps to cut waste further? Sprits and hackathons will look at how we can make a significant step change in the war on leakage and how we can draw from other sectors to implement solutions.
Hack – How to Avoid Beast from the East

How do we avoid Beast from the East part deux? Network data vs. weather data
Sponsored by IBM & The Weather Company

The Beast from the East in 2018 saw the UK plunged into chaos. With climate experts predicting extreme weather becoming more and more common in our near future, this poses a massive problem for our society. Join us to explore how the water industry can look to mitigate the effects of extreme weather events and help make a difference to the resilience of our water networks. We will be blending together a range of data sets, from network to weather to operational, to develop innovative and novel ways to change the way we prepare and respond to the effects of climate change. In turn this will ensure that all our customers can continue receiving the precious commodity that is water.

Data Sets Used

- Asset Data
- Telemetry Data
- Weather Data
- Customer Data
- Travel Data
- Burst Data
• **DMA DNA:** Utilising data in novel ways to drive more granular understanding of the risk to particular DMA’s in extreme weather events

• **Resilience asset performance – extreme weather:** Using latest science to compare correlations with climate change projections to enable teams to provide an indication of how these links might change in the future and the impact they will have on water-industry assets

• **Temporary satellite stores:** Creation of temporary ‘store units’ to house items such as barriers, salts and bottled water, assisting crews in preparation for extreme weather events to ensure customer service levels are maintained throughout.

• **ARK** - creating a hub of resources for communities to pull on during extreme weather events
Data in Weather and Climate Services

Malcolm Lee
Met Office
Content

Big data – a Met Office perspective
Transforming data - for customer benefit
Analysing data – anatomy of “Beast from the East”
Presenting data – the customer service
Probability data – dealing with shades of grey.

Met Office Big data

https://www.youtube.com/watch?v=tI0uOtiXoFrq
1km Observation Grids
Daily rainfall, max and min temperature from 1960
15bn values

Forecast Grids

Global
- 25km 70 Levels
- 48hr forecast twice/day
- 144hr forecast twice/day

Euro4
- 4km 70 Levels
- 60hr forecast twice/day
- 120hr forecast twice/day

UKV
- 1.5km 70 Levels
- 36hr forecast eight times/day
Capturing uncertainty using Ensembles

Deterministic Forecast

Dimension 6!

Initial Condition Uncertainty

Analysis

Forecast uncertainty

Synthetic weather

Creating plausible weather from statistical relationships
Summary

Observational 1km Gridding (248,000 point values per parameter per day) – No missing data
Gridding – Aggregate to post codes, catchments etc.
Ensembles – Uncertainty and probability
Climate model output – Climate change impacts and scenarios
Synthetic weather – Black swan events – Plausible extremes not yet experienced

Consider local and global scales – atomic access and aggregation
Extreme value analysis – return periods with climate change adjustment
Weather into context – 60 years of high quality records.
Weather sensitivity analysis – Marrying our data with yours

Transforming Data
Weather Intelligence Modelling

- Water Demand
- Turbidity & Colour
- Bursts
- Leakage
- Bathing Water Quality
- CSO Alerts
- Leaching
- Sewer Flooding
Monitored Data Quality

- Rubbish in – rubbish out
- Space reference needed
- Time reference needed
- Instantaneous, total or average
- Record length
- Stationarity – time trends
- Coping with missing values
- Testing for and labelling erroneous values.

Water Demand

- Temperature structure

![Graph showing water demand variations with temperature and other factors]
The Beast from the East
Why was it so disruptive?

Impact on Water Supply

- For some water companies it created a spike in Distribution Input that was higher than those caused by any other phenomenon, such as heatwaves.
- “...more than 200,000 customers did not have water supply for more than four hours and tens of thousands were left off supply for days.” Source: OFWAT
- “Poor preparation and planning, with several companies lacking adequate emergency response plans and mainly reacting to events as they happened.” Source: OFWAT
Event in Context

- Analysing weather data since 2000 – March 2018 freeze was **UNIQUE** in southern England
- Most severe event in southern England since 1997 (1:20 year event?)
- Further 5 more severe events on the previous 35 years (1:7 year event?)
- BIG DATA is vital to avoid wrong conclusions
- Extreme value analysis would help to unravel the return period uncertainty
- Introducing climate model output enables return periods to be adjusted for future.

The Freeze/Thaw Process

- Very cold temperatures
- Strong winds
- Penetrating cold
- Many frozen service pipes
- Moderately Rapid Weekend Thaw
- Substantial loss of potable water
‘Feels Like’ Temperature


- Combination of actual temperature with the wind speed to give an index
- However a dry object CANNOT get colder than the ambient air
- So only applied here if the actual temperature is at or below zero
- Hourly accumulation of ‘feels-like’ temperature below zero gives an index measure of the severity of the combined wind and temperature impact.
- An indicator. Many factors determine the exposure of an individual pipe to ambient air below freezing.

Difference between Actual and ‘Feels Like’ Accumulations

Nov/Dec 2010 compared with Feb/Mar 2018

Normalised Temperature Index

Feels Like  | Actual
Freeze Event
"Feels Like"
Accumulation
Heathrow

Freeze Event
"Feels Like"
Accumulation
Yorkshire
1. For customers already taking a water demand forecast service
2. Carry out the analytics to calibrate a FTI module
3. Add on the enhanced DI (as a function of FTI if sufficient data exist) when the cold weather threshold triggers
Threshold-based Alert

1. Compare Freeze/Thaw index (FTI) with DI data (if available, otherwise use analogues)
2. Use FTI value during ‘Beast from East’ as a marker for southern water companies
3. Establish FTI thresholds that cause uplifts to DI
4. Forecast FTI updated daily up to 14 days ahead
5. Advise via email or SMS of initiation, severity (using RAG) and end of a freezing period

Green = No freeze/Thaw event anticipated
Amber = Freeze/thaw event forecast, but impact on DI within normal variability
Red = Freeze/thaw event forecast, with above normal levels of DI

Optional Service Format
Email or SMS

1. Green – No freeze/thaw event expected from 15th to 25th December.
2. Amber – Freeze event to start on 17th December and end on 18th December.
3. Red – Freeze event to start on 21st December and end on 24th December.
4. Red – Freeze event currently in progress to end on December 19th.

For large water company areas the service could be provided for several locations.
## Optional Service Format – Email/ftp

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## Probability Data

### Seasonal Forecasting

10-90 days ahead
Seasonal forecasting overview

Not like daily forecasting cannot be as definitive
- Ensembles allow us to understand likelihood of events compared with climatology
- Monthly briefings available

Making Seasonal Forecasts Useful

EU Horizon 2020 Project in progress to achieve this – SECLI-FIRM
Processing, transforming and presenting seasonal forecast information
Water Demand forecasting is one testbed
Working explicitly with Thames and United Utilities on use cases
All water companies are welcome to become involved
Thank you

For more information on the Freeze-Thaw service or anything else mentioned in this presentation please speak to us during the break or contact us on Water@metoffice.gov.uk

Managing asset performance and its impact on customers

Michael Potter
Thames Water
Managing asset performance and its impact on customers

Mike Potter
CTO

Thames Water – Who are We

£2B turnover
250K smart water meters
2.78 litres of drinking water a day
Self-generate 20% of electricity needs

16M customers
4.48 litres of sewage a day
97 water treatment works
100K of sewers

6K employees

2.78 litres of drinking water a day
97 water treatment works
100K of sewers
What We Have Done

**Event Viewer**

- This allows us to see live our trunk mains network and see how events unfold in real time.
- This will allow us to respond dynamically as well as publish this to our website to help customers understand what’s happening.
- It allows us to pre-view and re-view events, so we can look back and learn as well as prepare for planned events.
- We will extend this to our whole network next year.

**System Risk Visualisation**

- This platform allows us to assess in which DMA and where in the DMA a leak may be occurring, so we can target our detection teams more effectively.
- It’s based on real time information such as acoustic loggers and our historic network data to help understand where failure is likely to happen.
- It’ll be developed to eventually help us target our proactive maintenance and may also help us evolve our network design to reduce leakage in the long-term.

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**Beast from the East**
Event Viewer –
Improving incident management in near real time

Problem Statement
- Throughout the Beast from the east event, it was observed there were number of issues with the Thames Water response and following are some of the lessons from the team:
- Limited information was available with agents handling customer contacts
- Response was reactive than proactive, reliant on customer to make contacts
- Our ability to reach out to affected customers (TGC) needs improvement, as they expects us to keep them informed
- Scattered information, hindering the speed of response and ability to quantify scale of impact

The solution
Thames Water have built the Event Viewer collection of apps which will enable us to:
1. Spot emerging events
2. Identify risk via incoming customer contacts pressure data from the network
3. Differentiate between types of event (no water, water quality, etc.)
4. Support the management of an event by providing contextual information in real-time (bottled water locations, customer hubs, number of customers impacted, number of vulnerable customer impacted, etc.)
13/11/2019

Which DMA? Tool

Problem Statement

- To increase the productivity and leakage yield of our detection operation, through integrating data more effectively, so that data science can increase our actionable insight within the field and office
- An automated tool is needed to give accurate leakage related data for every DMA
- To enable prioritisation of a better mix of DMAs to target and maximise leakage return
- So that, higher leakage yielding DMAs are targeted and DMA management strategies are better informed

The solution

1. An automatically refreshing tool to Build on the Data Factory's emerging Smart Network Platform which empowers users to manage DMAs by "Tailoring" interventions & tasks
2. Desktop tool to inform prioritisation of leakage yielding DMAs and DMA campaign management
3. Improved data science led ranking of DMAs
4. Drillable insight consolidated in a single platform
‘Where in the DMA?’ Tool

Problem Statement
• To increase the productivity of leak detection technicians by advising them on where to find the highest volume of leakage within a DMA, using data science techniques to highlight high risk sections of the network
• A tool is needed to identify pipes at high risk of leaking within a DMA
• To enable, finding leaks as quickly and efficiently as possible within the DMA
• So that, the yield by unit of effort is maximised (Team, individual per day) per leak detection activity in order to have more repairs on the network

The solution
• Geospatial view of “near real-time” leakage statistics and repair & detection activities on the entire network to quickly find and fix material leaks
• Desktop Geospatial tool designed to inform the tracking of detection activities and productivity (leaks found / time spent detecting) from the office
• ‘In Field’ Mobile app to help Detection Technicians prioritise which areas of the DMA to detect within first to find the highest volume of leakage in the shortest possible time
• Connection with detection partners systems and coordinated DMA leakage reporting platforms
Deprioritising low risk pipes

What percentage of historic repairs appears in each risk category?

<table>
<thead>
<tr>
<th>Model</th>
<th>Red</th>
<th>Amber</th>
<th>Yellow</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVP Model XGBoost (old)</td>
<td>15%</td>
<td>18%</td>
<td>16%</td>
<td>52%</td>
</tr>
<tr>
<td>Survival Model ANM (v1 of new model)</td>
<td>21%</td>
<td>24%</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Survival Model Network (v2 of new model)</td>
<td>21%</td>
<td>24%</td>
<td>16%</td>
<td>7%</td>
</tr>
</tbody>
</table>

System Risk Visualisation

Problem Statement

- As a result of the cluster of trunk mains bursts between October 2016 and January 2017, we initiated internal and external review with findings including the following:
- Limited information was available to the operation control to detect geographies with emerging risk
- It was difficult and manual to access the real time impact and source of bursts
- There was a lack of capability to bring together variety of data sources, combine and have a live view of our trunk main risk
- Scattered information, hindering the speed of response and ability to quantify scale of impact

The solution

In order to mitigate issues Thames Water have embarked in developing the System Risk Visualisation product to enable Thames Water to:

1. Spot emerging burst risks
2. Identify risks to a pipe granularity
3. Have a single location for all information to detect and manage a trunk main event with an easy user experience
4. Visually see the upstream and downstream impact
System Risk Visualisation

Future Development

Integrating with other products

Scaling the infrastructure and the platform for other areas

Learning from data – event replays

Empowering work force to make better data-driven decisions

Visualising the health of our networks in near-real time
Developed with operational technicians, analysts and standby managers in mind, our Major Incident Support Tool (MIST) has been built in close collaboration with our Geospatial Transformation team. MIST is designed to help make informed decisions, alongside our current processes and procedures, when dealing with major events and incidents.

Developed within our corporate IT systems, MIST utilises data from GIS, SAP and our estate of 4,000 CML pressure loggers, to determine at a property level, which customers may be at risk of no water.

Analysis of our pressure data is run every 30 minutes, and provides a valuable graphic insight into the state of our vast water network.

MIST : An overview
MIST Dashboard

Designed for use in Operational Silver and Gold Centres.
Displays high level visualisation and data to support strategic decisions aligned with operational activity and customer impact.
Access: Gold & Silver Managers x40

MIST GeoWeb

Designed for use in Operational Silver Centres and incident responders.
Both high level & granular visualisation and data to inform tactical decision making and customer impact assessment.
Access: Bronze managers / Network techs x130
Table of largest impacted zones with >50 customers affected

Overall impact reflects current ‘zoomed to’ area

Colour coded indicators of areas of customer impact

Standard GeoWeb functionality & tools

Layer switching to provide dynamic visuals

Colour coded indicators of areas of customer impact
MIST : In practice

Event declared by means of customer calls / CML alerts / asset alarms / other intelligence. The following example was an actual burst trunk main event in Hereford.

- Initial alarm sent to Smart Hub
- Pressure threshold alarms configured for all CML loggers
- Confirmed high flows on outlet of reservoir.

Initial alarm sent to Smart Hub
Confirmed high flows on outlet of reservoir.
Alarm triaged and escalated with supporting data and information.

Initial automated hydraulic assessment determines potential properties with no water / low pressure, together with highest impacted area.

Average flow profile supports alternative supplies decisions.

GeoWeb: Developing issue identified and visualised.

Blue stars – “No Water” Calls within 24 hours.

Red – Customer impact in zone
Green – No impact in zone
Purple – Pending data update.
GeoWeb: Zooming in will show Network, Contour Lines and calculated Affected Properties.

GeoWeb: Zooming in further allows Operational Staff to consider rezoning options.

Potential to cross-feed by opening a boundary valve.

Annotations can be added to the map:
GeoWeb: Properties can be selected and exported to support mass texting

Property pressure calculated using property Z values

MIST DASHBOARD Overview of impacted area

Red – Customer impact in zone
Green – No impact in zone
Purple – Pending data update
Annotations applied to inform mitigation

Annotations visualised in Incident Centre Dashboard for live updates

MIST : Post Event
Post event analysis supported by historic data stored within MIST database for up to 5 days.
Post event extract includes relevant data to support regulatory responses and further in depth analysis.

<table>
<thead>
<tr>
<th>PropertyClass</th>
<th>CustomerRef</th>
<th>FirstAffected</th>
<th>Impact Duration</th>
<th>Bottled Water Delivery</th>
<th>SapTechnicalObjectId</th>
<th>UPRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>DmaRef</td>
<td>Address</td>
<td>DmaName</td>
<td>Postcode</td>
<td>SapTechnicalObjectId</td>
<td>UPRN</td>
<td></td>
</tr>
</tbody>
</table>
| Dwir Cymru Welsh Water | Future Development - Real time extract improves Customer Service in Major Events.
Defining the state of the possible: customer engagement, predictive analysis and Digital Twins

Hosted by Fred Royan
Global VP Research in Sustainability & Circular Economy – Industrial, Frost and Sullivan
Representing SWAN Forum

Decision Intelligence

Ruth Clarke
Business Development Manager
Xylem

REGISTER AT - https://tinyurl.com/y4b6f35d
Solutions across the water cycle

- Raw water intake and monitoring
- Water distribution and transfer
- Communication network
- Wastewater collection
- Management of water resources
- Wastewater management and treatment
- Raw water intake and monitoring
- Gain Control of Your Data
- Reduce System Losses
- Proactively Manage Your Assets
- Advance Water Equity
- Manage the Urban Watershed
- Ensure Quality from Source to Tap
The need for actionable information?

Power and Water: Smart District and Water Management System

Pier Vittorio Rebba, Head of Technology, Power Generation & Water – ABB
Power & Water
Smart District and Water Management System
Pier Vittorio Reba – Head of Technology, Industrial Automation Energy - Power & Water

Water megatrends
Technological, environmental and social trends impacting the world of water

- Rapid growth of population
  - Demanding access to water
  - The population to reach 9.7 billion by 2050

- Higher standards
  - Globally, 80% of wastewater is left unprocessed
  - Focus on quality of water in developing countries
  - Groundwater needs protection from agricultural chemical agents and other pollutants

- Urbanization
  - Population cluster in cities
  - Increased stress on existing infrastructure

- Climate change
  - In 2050, more than 40% of population will live with severe water stress
  - Rising sea levels increase risk of flooding

- Ageing infrastructure
  - Leaks range losses between 5-30% in western countries and 50-70% in developing countries
  - Huge investments to keep plants operational

Source:
1) United Nations Population Division (www.population.un.org)
2) United Nations Water (www.unwater.org/unwater-facts)
ABB Ability - Quantum leap in digital
Creating one common platform for digital end-to-end solutions

ABB Ability Service Solutions
- Collaborative Operation Center ... COC on Microsoft Azure
- Connected Worker ... AR/VR Operations on Microsoft Hololens
- OT Cybersecurity ... Cybersecurity Workplace

ABB Ability Solutions for Energy & Asset Management
- Enterprise Energy Management ... OPTIMAXX PowerFit
- Asset Performance Management ... Asset Health
- Simulation and Digital Twins

ABB Ability Solutions for Operation & Optimization
- Real Time Optimization ... Dynamic Optimizer
- Advanced Process Control ... Predict & Control
- PLC/DCS ... Symphony Plus, 800xA

Closing the loop with connected devices

Smart District – Integration for innovation

Control Room of the City

Power

Water

Shore to ship

Mobility

Waste

Grid

Buildings

District heating
Water management 4 Smart Cities
ABB Water Information Management System (WIMS)

- Fully integrated solution also with 3rd party components
- Real-time operation optimization and decisional support
- Complete water network information management
- A WIMS with Water transmission & distribution data management, control integrating IoT components with Quality, Energy Efficiency and Asset management

Water Management System

A unified platform for integration of data from multi-level sources (including existing SCADA systems) which enables the capability to effectively manage operations across the entire integrated water system, also connecting together different type of plants or networks.

WMS is naturally designed to provide enhanced situational awareness of operations and access to a range of advanced applications using state of the art techniques in data analysis and optimization.

Information gathering from nearly any kind of source to view hidden relationships, patterns and correlations and to help bridge the gap between the physical world of control systems and the realm of business decisions.

IOT EDGE Scada solution is a strong fit with this type of architecture in line with a concept of innovative automation platform for water.

Key benefits of WMS solution
- Water usage balancing and demand management
- Proactive decision support to operations
- Asset health management
- Improvement in Pumping efficiency and Energy demand efficiency
- Water quality monitoring
- Improvement in Non Revenue Water percentage
- On-time decision based on automated daily, weekly and monthly reports and trends
- Hydraulic modeling

ABB has a strong advantage
- Already providing several elements below WMS layer
- Ability to handle global and complex projects thru system units
- ABB Ability concept is the bed-rock of such solution
- Support infrastructure (cloud, COC, APM)
Digital twin refers to a digital replica of physical assets (physical twin), processes, people, places, systems and devices that can be used for various purposes. It is worth of mentioning the connection between the physical model and the corresponding virtual model or virtual counterpart, established by generating real-time data using sensors.

A Digital Twin is not univocal because its structure is strictly related to the purpose. An asset can be analyzed by 4 different points of view corresponding to 4 different scenarios in which the Digital Twin is useful:

- Design
- Engineering
- Operation
- Service (Maintenance)

ABB is involved in the analysis of different Digital Twins in the Power and Water Industry. It's collaborating in the START 4.0 project for the Digital Twin of the Genoa Harbour.

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Digital Intelligent Assistant for Control Rooms and Plants

AI as support for Operations

Artificial Intelligence can suggest best case actions that have proven success in the past in similar conditions. This can help in putting in place preventive manoeuvres as well as troubleshooting emergencies.
Lessons learned from using a customer centred approaches in smart water

Dr Bojana Jankovic-Nisic, Technical Director, Digital Lead for Water, Energy, Environment, Security and Industry – Arcadis
Content

- 2020-25 business plans – Customer highlights
- Why customer centred approach – the idea of where the value sits
- Use cases
- Lessons learned

PR19 methodology set out expectations that:
- companies must engage with their customers on how they will address affordability
- understanding customers is essential for companies if they are to improve and tailor their customer service in line with their customers’ preferences;
- companies must engage with their customers on longer-term issues, including resilience; and
- companies should be much more innovative in their approaches to customer engagement.

The plans will require a plethora of ways to engage and empower the customers
Why customer centred approach

The idea of what “value” is in our natural and built environment industry is changing and understanding it requires getting closer to the users of things we design and operate through vast increases in data and collaborations.

Increasing number of examples demonstrate that value created is about end-user experience not just the asset we deliver.

How do we access and understand our customers to evaluate our new ideas?

Many organizations have discovered that an “experiment with everything” approach has surprisingly large payoffs.

Use Cases

Customer experience is about creating a friction-less (digital) experience for our clients and ultimately their customers: the end users of natural and built assets.

Using new digital technologies, we are helping our clients in the UK to understand and anticipate their customers local but complex needs.
How can we motivate people to reduce their water consumption (without compromising their lifestyle)?

Sprint Orange

A combination of Design Thinking - a human-centred design process for innovation where empathy for those the design is made for is at its heart - and Design Sprint, a process for solving complex issues with an ecosystem.
**Water Proof**

*Sprint Orange* process generated

**Water Proof** - a digital concept for engaging with and creating hyper-aware citizens in Brighton, fully bought in to the ownership of their water footprint and incentivised to cut their water use.

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**Where are we now**

**Sprint Orange**

**Water Proof**

**Customer Story**

**Prototype Dashboard**

---

**Desirability**

Will people value it?

‘Low hanging fruit’ communities as a test ground?

What kind of engagement platform is preferred?

**Feasibility**

Can we deliver it?

What data do we need?

Can we access it?

**Viability**

Can we make or save money from it?

What is the business model?
How can we plan our workforce better to respond more effectively to supply and demand deficits?

**Water supply-demand predictive analytics**

*Severn Trent Water* use a novel WARP (Work And Resources Planning) forecasting tool aimed at balancing supply and demand (including leakage) which uses predictive analytics for proactive workforce resource planning.
Water supply-demand predictive analytics

Business Benefits
- Improved operational efficiency by up to 20%
- Best use of your data to allow what-if planning scenarios
- Increase utilisation and productivity of current staff
- Optimize production
- Create more effective and targeted training programs for your staff
- Improve staff motivation through realistic and effective planning
- Enable effective management of industry and/or regulatory change

How can we understand the root cause of discolouration and develop proactive management during disruption?
As part of a regulatory requirement and their Smart Water Networks strategy, Southern Water deployed water quality sensors resulting in one of the most comprehensive water quality datasets in a supply zone in the water industry.

**Rownhams smart water network**

Southern Water’s Rownhams Supply zone suffers from discolouration, resulting in a high number of customer complaints amongst its 69,500 properties.

- **62** Sensors were deployed in a supply zone.
- **>14 Months of water quality data**
- **>20m** Data points for turbidity and chlorine have been analysed.
- **>15** Data sets. Existing data sets was used to further validate the sensors readings, and to understand the network and customer response.

As part of a regulatory requirement and their Smart Water Networks strategy, Southern Water deployed water quality sensors resulting in one of the most comprehensive water quality datasets in a supply zone in the water industry.

**Rownhams Network Behaviour and Root Cause**

Source Water  
Transmission of Sediment  
Conditioning Velocities and Shear Stress
Unexplained customer contacts

Most customer contacts are background customer contacts i.e. are not associated with burst events

Interventions and Smart Networks Strategy

Potential for significant reduction in the need for capital interventions and frequency of operational activities

“The DWI are open to holding a wider meeting with other inspectors to disseminate learning from the smart networks project.”
How can we dissect the root cause of leakage to better understand customer impact during extreme freeze-thaw events?

Southern Water Leakage Root Cause

Thorough analysis of a broad range of the possibilities of the root case of leakage and recommendations for further action.

- 50+ data sets
- Investigate hypothesis with experiments
- Feedback and prioritisation with Southern Water
- Supplementary data requests
- Final results and recommendations
- Hypothesis generated and investigated

1. Weather and seasonal variations
2. Capital programme targeting
3. Asset base characteristics inherent impacts
4. DMA natural rate of rise behaviours
5. Regional discrepancies
6. Contract incentives
7. Renewal programme
8. Trunk Main balance close out
9. End to end process of leakage targeting and reporting
Southern Water Leakage Root Cause

Hypothesis: Asset base characteristics
‘Patchwork Quilt’ effect on leakage.

Hypothesis: Dataset Discrepancies
Data refresh impact in growth areas, along a major transport corridor.

Hypothesis: Effectiveness of leakage control

New Opportunities Enabled by Digital Technologies

Customers demand new levels of experience and service.

New Product development techniques req. acknowledging and servicing customer journeys.

Ability to analyse customer needs and behaviour (in real time) is essential.

Operating in faster lane of product and business model change.

Moving from traditional waterfall-like manner to continuously testing and iterating change in a manner more closely tuned to market changes is new to us and our clients (in water).

Combinatorial innovation is key.
Thank you

Q&A

DR BOJANA JANKOVIC-NISIC
Technical Director, Water Infrastructure
dd +44 (0) 7793389480
e bojana.jankovic-nisic@arcadis.com

Pete Daykin, CEO and Co-Founder – Wordnerds
When we talk about big data we mean numbers.
We like numbers, we know what they mean.
But 80% of actionable data exists in the form of unstructured text

Language is... vast, nebulous, loud, confusing, sarcastic, diverse, surprising, colloquial, fluid, shrtnd and yoof, bruv. Spelling is hit and miss
Making it invisible to most organisations

What about “AI-driven” social listening platforms?
They're great at visualising quantitative data (likes, reach etc.) but don’t give you actionable insight from written content… they count.

**Brand sentiment**
Brand sentiment is a computational analysis of social media mentions of our brand. Algorithms using Natural Language Processing recognises certain words and phrases as positive, neutral or negative.

- 1.8k positive 😊
- 2.4k neutral 😐
- 1.6k negative 😞

Artificial intelligence is like teenage sex: everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it...
Wordnerds’ SaaS platform combines deep learning, NLP and linguistics

To understand the meaning of text, not just count the words people use
As linguists we get that context dictates meaning.
5-split Sentiment Analysis Test

<table>
<thead>
<tr>
<th></th>
<th>% Accurate</th>
<th>% Within One</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wordnerds</td>
<td>59%</td>
<td>93%</td>
</tr>
<tr>
<td>Google NLP</td>
<td>45%</td>
<td>78%</td>
</tr>
<tr>
<td>IBM Watson</td>
<td>40%</td>
<td>53%</td>
</tr>
</tbody>
</table>

(UK water companies are already using us to cut through the noise)

(And we’re getting pretty good at it)
Case Study 1

Customers as sensors
- Detect leaks
- Save money

Timeline of a leak

1. Customer contacts council about the public leak, thinking that it’s their responsibility.
2. Council responds, requesting that the user contacts NWL (does not copy in NWL).
3. Customer contacts NWL.
4. NWL responds and starts to address the issue
Every minute a leak is undetected costs money

User contacts council about the public leak.

3:32 pm

Council responds, requesting that the user contacts NWL (does not copy in NWL)

3:32 pm

User contacts NWL

4:21 pm

NWL responds and starts to address the issue

4:34 pm

But Wordnerds discovered the leak in a tweet 24 hours earlier

@NewcastleCC there’s a water leak gushing from a crack in the pavement at Leazes Park Rd adjacent to Milligan’s the Eldon Gardens end.

4:10 PM - 18 Jun 2018

Again, it was aimed at the Council.

Again, the Council did not copy in NWL
Case Study 2

How do you increase brand satisfaction, when customers only think about you if something goes wrong? (C-Mex)

Show customers you care
Surprise and delight
Opportunity to show you care: related issues

Leigh Robinson
@Laggymlster
No water supply at Hedworth Court Sunderland 70 flats in block this weekend #Gentoo disgrace @gентooGroup @JulieElliottMP @SunderlandEcho no help, no support for the vulnerable, hygiene health and safety, anyone care? NOPE!
8:48 PM - 24 Jun 2018
3 Likes

Northumbrian Water
@nwatercare
Replying to @Laggymlster @gентooGroup and 2 others
Hi Leigh, we received a call form a tenant today advising they still had no water. We spoke directly to Gentoo about this and I believe they are looking into this now. Thanks
10:00 AM - 29 Jun 2018

Leigh Robinson
@Laggymlster
Thanks @nwatercare at least you had courtesy to get back to us! @gентooGroup #gентooGroup appalling customer service from gentoo!
Thanks to the skill of NWG’s social media team, 88% of their lighthearted replies were liked, or replied to with thanks, by the original user.

Their overall engagement rate was 9%, seven times industry best practice and forty times the company’s previous engagement rate.
Use of our tech in extreme weather events:

- Disseminate information and receive user feedback
- Identify vulnerable customers/victim requests
- Emergency comms/warnings
- Establish situational awareness/damage estimates

We know from the academic research people use social in emergencies and disasters
Use of our tech in extreme weather events:

- Disseminate information and receive user feedback
- Identify vulnerable customers/victim requests
- Emergency comms/warnings
- Establish situational awareness/damage estimates

Any questions?
Panel Discussion

Ruth Clarke, Xylem
Pier Vittorio Rebba, ABB
Dr Bojana Jankovic-Nisic, Arcadis
Pete Daykin, Wordnerds

How data-enabled open innovation can solve real-world problems

Hosted by Leigh Dodds
Director of Advisory, The ODI
Using Data to Solve Real-World Problems

Molly Strauss, Principle Programme and Policy Officer
GLA.
London’s Approach

The Greater London Authority’s Infrastructure team bases its work around data

- Key purpose: Infrastructure Coordination
- Data projects fall within the SMARTER LONDON TOGETHER roadmap – Chief Digital Officer
- Digital tools underpin our delivery work
- Each one answers specific questions – useful for particular decision-making processes
- GLA pursues partnerships wherever possible – with cities/regions, local authorities, infrastructure providers, technical experts, suppliers, etc.
- I will cover two digital tools today.

Infrastructure Mapping Application (IMA)
What is the IMA?

An interactive, online tool designed to integrate infrastructure and development data, encouraging coordination and strategic planning across Greater London.

TWO KEY USES:

COORDINATION
- Identify opportunities for joint streetworks

PLANNING FOR GROWTH
- Understand where new construction and population is expected, to plan infrastructure delivery

IMA: Data and Overview

Extensive data is currently live in the IMA

- Future investment data from key asset owners:
  - Thames Water
  - SGN
  - TIL
  - UKPN
  - Cadent
  - SSE
  - Environment Agency
  - National Grid
  - Network Rail

- Context and development data also included from:
  - Mayor of London
  - London Development Database
  - Barbour ABI

- Plus: first borough road resurfacing data – from Southwark

IMA DATA SNAPSHOT
- Over 25,000 data points
- In 50 layers

TWO VERSIONS
Publicly accessible – industry
Privately accessible – utilities / providers / some boroughs. Login required.

FUNDING
Lane Rental Surplus
IMA: Collaboration Tool

The IMA will keep identifying coordination initiatives and will continue development.

**USING THE TOOL**
- Utilising IMA to flag collaboration opportunities
- Seeking feedback
- Supporting Coordination Team

**ONGOING DEVELOPMENT / NEXT STEPS**
- Undergoing Phase 2 development
  - Focus on ‘planning for growth’
- Data Expansion / Improvement
  - **Asset condition** in addition to future investment plans
London’s Underground Asset Register (LUAR)

LUAR: Background

1. Builds on HADES proof of concept – led by Thames Water with support from TfL and other utilities
2. Received endorsement to proceed from Mayor’s Infrastructure High Level Group
3. Partnership with the Geospatial Commission as one of two national pilots (£2.4 million for London)
**LUAR Overview**

**LUAR's Use Cases**

- **Safe digging**
  - Fewer utility strikes
- **On-site efficiency**
  - Project efficiency savings
- **Site planning**
  - Project efficiency savings
- **Data exchange**
  - Data efficiency savings
- **Coordination**
  - Joint streetworks

**LUAR will deliver quickly**

- **To be completed by March 2020**
  - Focused on 5 use cases and stakeholder requirements (both data modelling and functionality)
- **Covering 6 local authorities**
  - Southwark, Croydon, Tower Hamlets, Newham, Camden, City of London
- **Vectorisation disparity**
  - LUAR is supporting partners requiring vectorisation
- **Final outcome will seek to serve all stakeholder needs (North-East and London)**

**LUAR Partners**

- **Geospatial Commission**
  - Funder of the pilot project
- **Local Authorities**
  - Work with the GLA to audit and provide their underground asset data and user requirements to Ordnance Survey to ensure the platform will meet their needs
- **Infrastructure Providers**
  - Work with the GLA to audit and provide their underground asset data, provide user requirements and align data systems with Ordnance Survey
- **GLA**
  - Source and prepare data through engagement with infrastructure providers and local authorities and feedback requirements to Ordnance Survey (with support from 1Spatial)
- **Ordnance Survey**
  - Build platform that meets the needs of the London and Northeast stakeholders and managing NEUAR partners' data input
LUAR Asset Owners

Asset Owners Engaging in LUAR

- Thames Water
- UKPN
- SGN
- Cadent
- TfL
- Environment Agency
- National Grid
- HS2
- Virgin
- BT/Openreach
- SES Water
- Tideway
- Community Fibre
- Historic England

Southwark
Croydon
City of London
Tower Hamlets
Newham
Camden

LUAR Project Timeline

Data Audit → Data Exploration Licence → Sample Data Provision → Data Modelling Harmonisation → Full Data Sharing Agreement

Vectorisation Assessment and Execution → Full Data Handover → OS Initial Platform Release → Field Testing → OS Next Platform Release → End of Project → March
Key Learnings

These projects have related challenges and themes:

- **Buy-in** from complex partners – utilities, infrastructure providers, local authorities – to change business-as-usual
- **Security, privacy** and ‘open’ **data** – concerns and solutions
- **Resources** – external funding, supporting partners, need for **people**
- **Data Management** – need to make the case to our partners to improve
- Using technology to **answer questions** and **create benefits** – not for its own sake
- From pilots to **ongoing services** – meeting partners where they are
- **Legal agreements** – often required for change to occur
- **Data modelling, schema and standards** – at the heart of this work
Approaches to open innovation: the Data Pitch Challenge model

Ellen Goodman, Startup Programme Manager
ODI / Data Pitch
Approaches to open innovation: the Data Pitch Challenge model

Ellen Goodman
Startup Community Manager
theODI.org

Our experience in open innovation approaches

- 7 years
- 9 Innovation programmes
- 191 startups and SMEs
- +600 jobs created
- £63m sales & investment
- £3m efficiencies
Create a European *data innovation ecosystem* that will bring together data owners and Big Data technology providers, with startups and SMEs with fresh ideas for data-driven products and services.

**Challenge Tracks**

- Data Provider Challenges
- Sector Challenges
- Open Innovation Challenge
Why share data with startups?

1. Bring fresh **ideas** into your organisation quickly with **low risk** and **low cost**
2. Access to **new skills** and cutting-edge technology
3. **Learn** more about your **data**, its **value** and innovation scope
4. Explore the opportunity to **collaborate** with **startups** and build relationships with the startup community

Smart Manufacturing Challenge: harnessing IoT data for tomorrow’s smart factories
Transport Challenge: changing public transport for the better

What did we learn?

- Defining the right challenge and onboarding takes time
- Open innovation should be central to an organisation’s agenda
- Toolkits for core processes
  - Data sharing toolkit
  - Legal and Privacy toolkit
THANK YOU!

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Open Innovation to Open Potential
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Thank you for your time!

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Summary and wrap up

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