



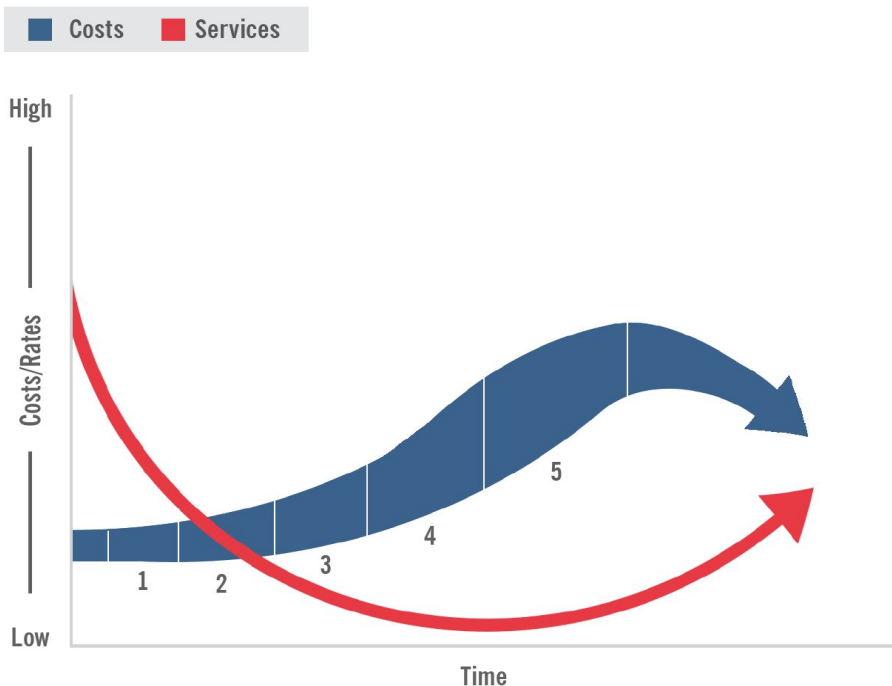
Embracing Technology

Marc Santos, PE - Isle Utilities



TRWA Fall Management Conference
October 22, 2020

Challenges to Embracing Technology



1. Initial assessment of existing service
2. Market research
3. Procurement/RFI/RFQ
4. Design/build
5. Adopting/training/SOPs

Credit: George Hawkins via Bipartisan Policy Center

Presentation Agenda

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Global Tech Ecosystem

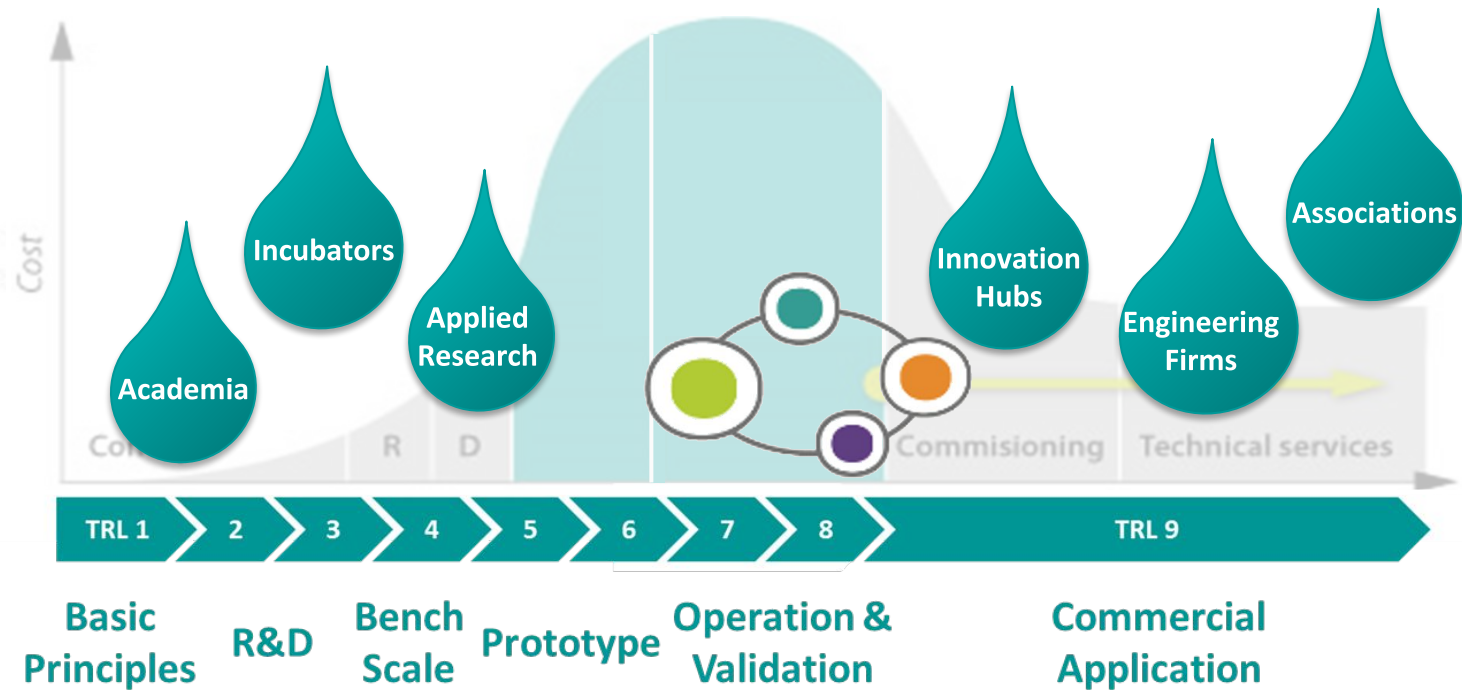
Technology Due Diligence

Technology Readiness Level (TRL)

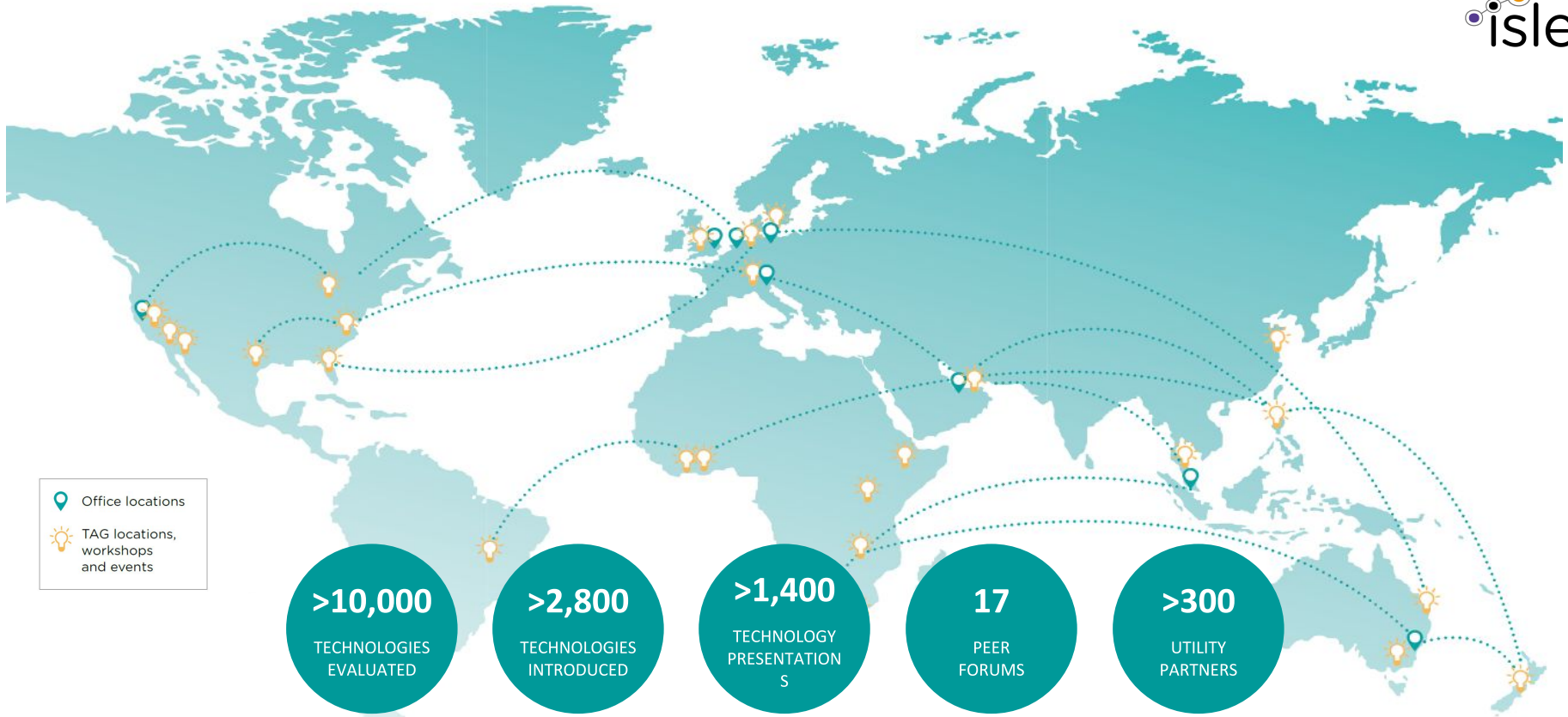
- A method for estimating the maturity of technologies developed at NASA in the 1970s.
- TRLs enable consistent, uniform discussions of technical maturity across different types of technology.



Innovation Ecosystem



TAG Technologies sit between a 6 and 9 on the Technology Readiness Level (TRL) scale. Isle serves as a go-to-market bridge to overcome barriers between development and commercialization.



Isle is a technical consultancy with 85 employees worldwide. All our services revolve around the strategic identification, evaluation, and implementation of best-fit technologies and practices.



Tech Areas to Consider

Some Areas of Improvement with Tech

Immediate

- ✓ **Data** - Improved and digital data collection and communications between field and office staff
- ✓ **Optimization** - Treatment process, chemicals/disposables, energy optimization
- ✓ **Water Loss and I&I** - Reduction of water loss or inflow and infiltration
- ✓ **Reporting** - Efficiency in internal and external reporting
- ✓ **Residuals** - Beneficial use or resource recovery of residuals or biosolids
- ✓ **Billing** - Accurate and adequate billing
- ✓ **Health and Safety** - Personal monitoring, LOTO, and hazard identification

Some Areas of Improvement with Tech

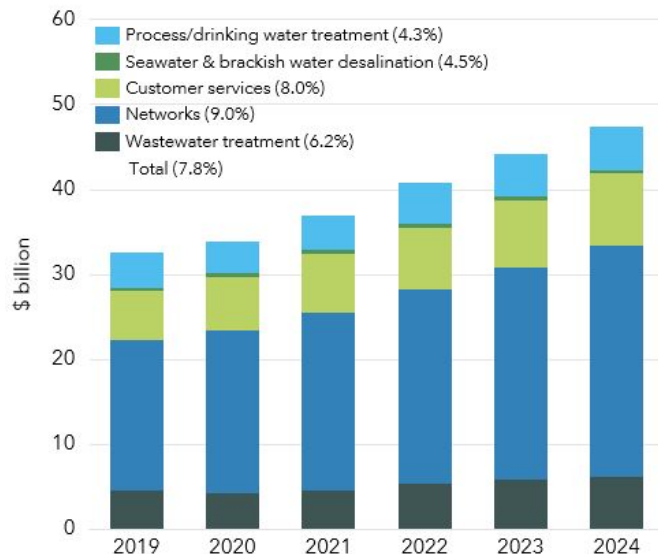
Longer Term

- ✓ **Preventative Maintenance** - Triggering and documenting effective maintenance
- ✓ **Asset Management** - Targeted replacement of linear assets (avoiding emergency fixes)
- ✓ **Communication** - Efficient communication with end users
- ✓ **Emergency** - Emergency preparedness for expected issues
- ✓ **Training** - Succession planning, documentation, and efficient training program

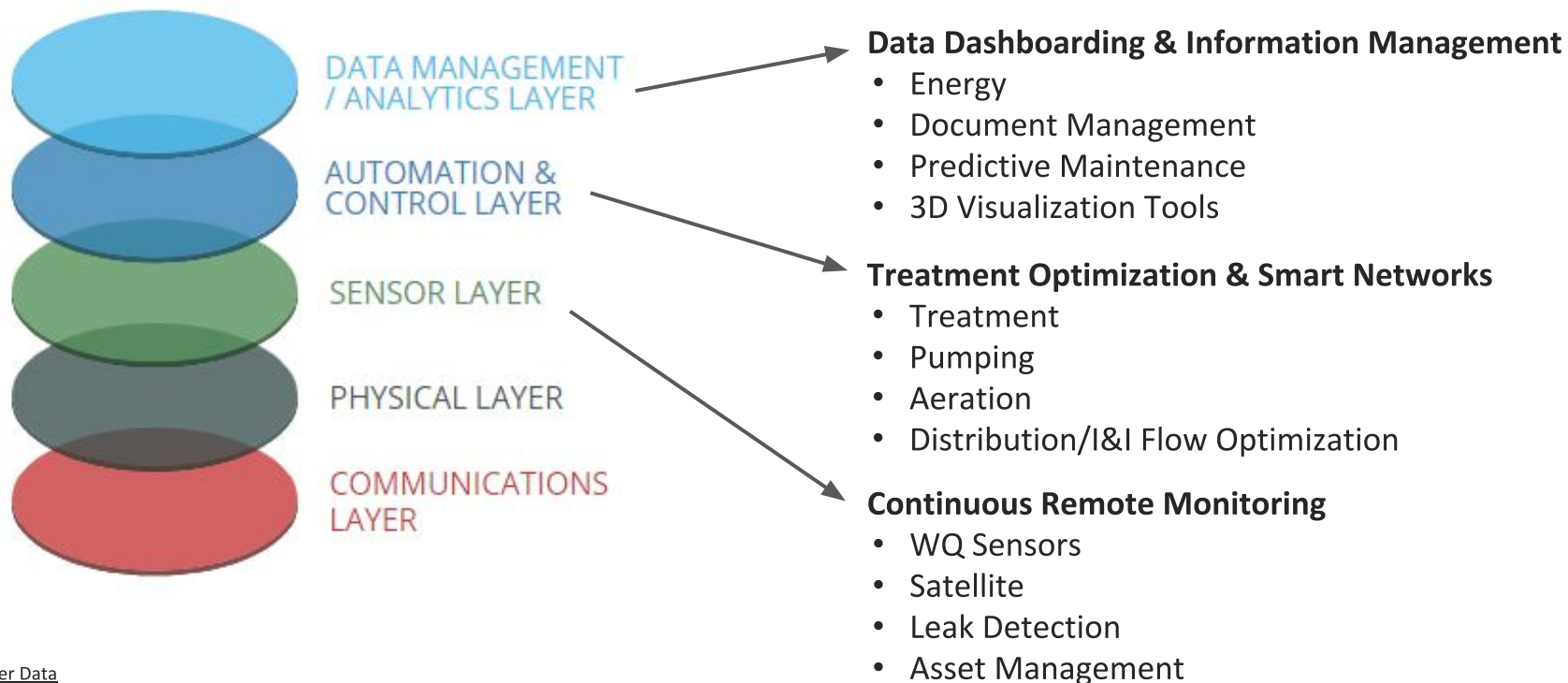
Global Trends: Digital Transformation

Automation and remote operations' role in securing service continuity during the COVID-19 pandemic has underlined the need for digital technologies, enabling support staff and on-the-ground operations staff to work remotely and utilities to remain in contact with their customers.

Utility Digitization Under COVID-19



Digital Transformation



Source: [GWI Water Data](#)

Some Tech Buzzwords

- Machine Learning/Predictive Maintenance
- Artificial Intelligence
- Fuzzy Logic
- IOT - Internet of Things
- Digital Twin
- SAAS - software as as service
- HAAS - hardware as a service
- DAAS - data as a service



Non-Revenue Water

Technology Overview



Mobile (ground mics, correlators)



Satellite/ Aerial



Monitoring Tech/
Fixed network



AI/Machine Learning

Reactive

Real Time

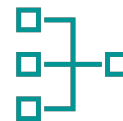
Predictive



Invasive
Monitoring/
Inspection



District
Metering/ Flow
monitoring



Pressure/
Trunk
Monitoring



Longitudinal
Sensors/ Fiber
Optic

Tech Filters

GLOBAL MARKET SCAN

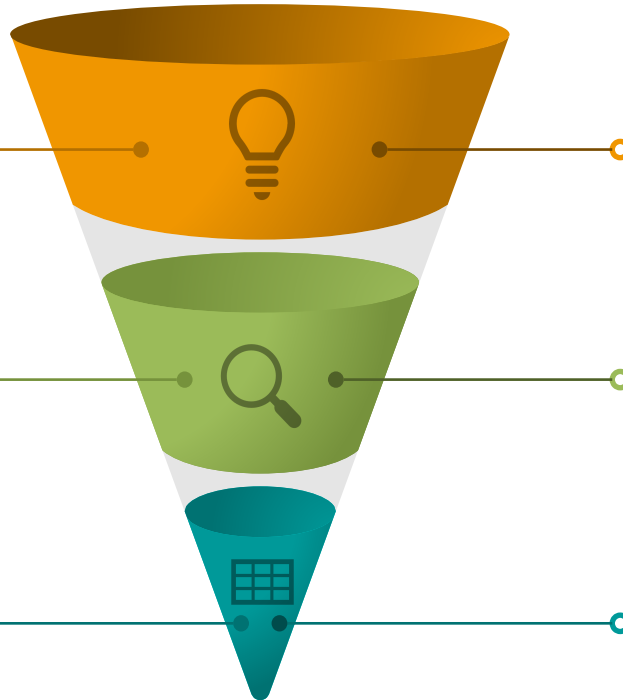
Full scan of the global market to identify all possible solutions in a technology area.

UTILITY TECH NEEDS

Evaluation of technologies for alignment with Utility's critical needs and criteria

BEST FIT LONGLIST

Longlist of techs with best fit for Utility's more immediate tech needs.



CRITERIA FOR LONGLIST

- ✓ Functional Diameter: 4"- 16"
- ✓ Material: PVC and AC pipe
- ✓ Deployment: Hydrants/valves
- ✓ GIS Integration
- ✓ Staff Training

SHORTLISTED TECH METRICS

- ✓ Operation and Deployment
- ✓ Reporting and Analysis
- ✓ Accuracy
- ✓ Communication
- ✓ Software and Data
- ✓ Customer Support

COMPARATIVE EVALUATION

- ✓ Reference Checking

Water Pigeon

USA | TRL 9



What challenge does this technology solve?

- Alternative to existing automated meter reading (AMR) solutions



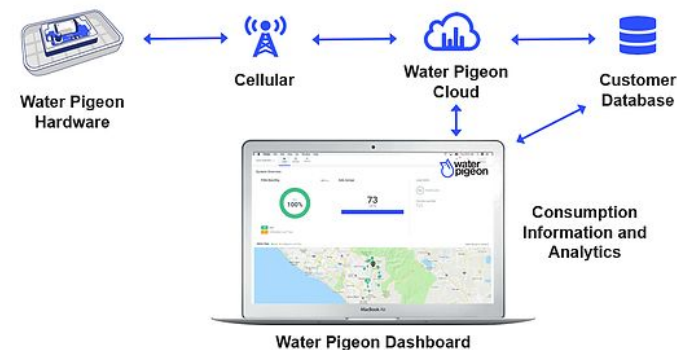
How does it work?

- Delivers AMI functionality by replacing existing meter box lids with a lid that has an inbuilt camera to capture images of the meter register
- Images are converted to data via optical character recognition (OCR)
- Transmitted over the existing cellular network to the utility
- Provides the utility with accurate meter reads and the ability to identify leaks on the customer side of the meter



Unique Selling Point / Competitive Advantage?

- Can be implemented at half the cost and one-tenth the time of current AMI/AMR offerings
- Deployed in 5 minutes or less



Watchtower Robotics

USA | TRL 9



What challenge does this technology solve?

- Early and accurate detection of leaks in distribution pipes



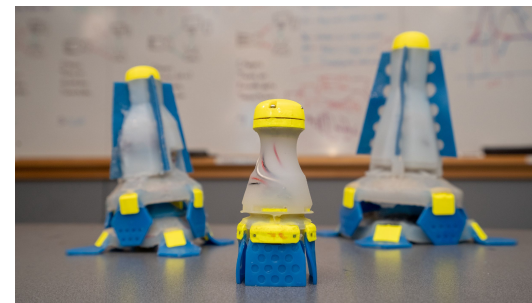
How does it work?

- Lighthouse is a soft body, untethered robot used for detection of leaks in metal and plastic water pipes
- Can be deployed from T junctions or hydrants to inspect pipes while in service
- Maps the pipe during inspection and records changes in pipe diameter
- Uses pressure measurement at the wall of the pipe to detect leaks



Unique Selling Point / Competitive Advantage?

- Lighthouse can detect leaks of 1 GPM with accuracy of 1ft, compared to 100ft accuracy of competing systems





Asset Management

Asset Management Techs



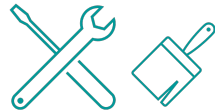
Asset Identification



Asset data management systems



Predictive Maintenance/
Machine Learning



Rehabilitation/
Coatings/CIPP



Condition Assessment and inspection tools



Equipment health monitoring

Subsurface Instruments

USA | TRL 9



What challenge does this technology solve?

- Locating plastic pipe diameter, depth, and location



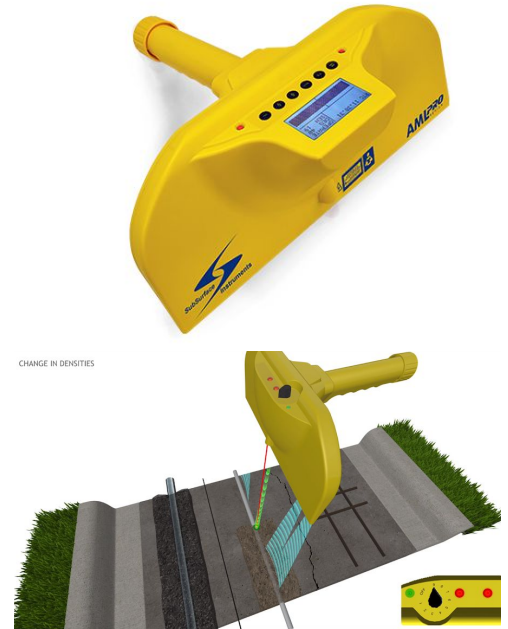
How does it work?

- Utilizes a combination of continuous, unmodulated ultra high frequency (UHF) and algorithmic data analysis
- Emits an inverted, conical UHF signal that seeks out the edges of objects
- Can detect objects down to 18 ft/6 m
- Can locate non-metallic pipe including (PVC, PE, PEX, PP, ABS, AC, etc.)



Unique Selling Point / Competitive Advantage?

- Unlike GPR it can work through wet soils, hard clays or solid rock
- It can scan a large area in seconds to minutes



vGIS

Canada | TRL 9



What challenge does this technology solve?

- Gap between GIS data and real-world integration



How does it work?

- vGIS Utilities transforms traditional “flat” GIS data into augmented reality displays and holograms
- Compatible with smart phones, tablets, or Microsoft Hololens
- Pipes and utility lines appear in the field of view as an extension of the real world
- Displays complex data points, such as ground penetrating radar scans



Unique Selling Point / Competitive Advantage?

- Creates instant awareness of surroundings, saving time and avoiding costly mistakes
- Prevents excavation-related accidents



Samsara IoT

USA | TRL 9



What challenge does this technology solve?

- Data visibility and analytics for equipment and operating data



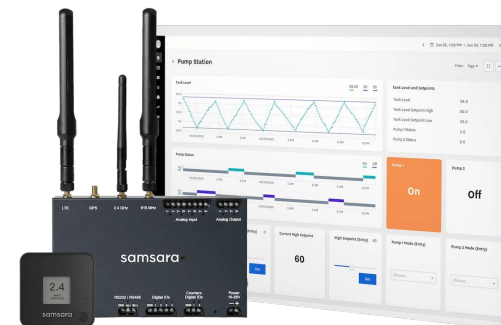
How does it work?

- Collects any existing data from sensors, PLCs, pumps, remote assets, and grab samples
- Creates dashboards with custom visualizations with little training
- Enables condition monitoring, predictive maintenance, optimization of pump efficiency and tank operations



Unique Selling Point / Competitive Advantage?

- Unlike traditional technologies, the data is stored in cloud and can be integrated with CMMS, water quality planning, and finance teams
- Allows integration of grab samples and field verifications along with online monitoring



RedEye

Australia | TRL 9

SaaS: BUSINESS
PROCESSES



What challenge does this technology solve?

- Engineering drawing management leading to safety and financial risks



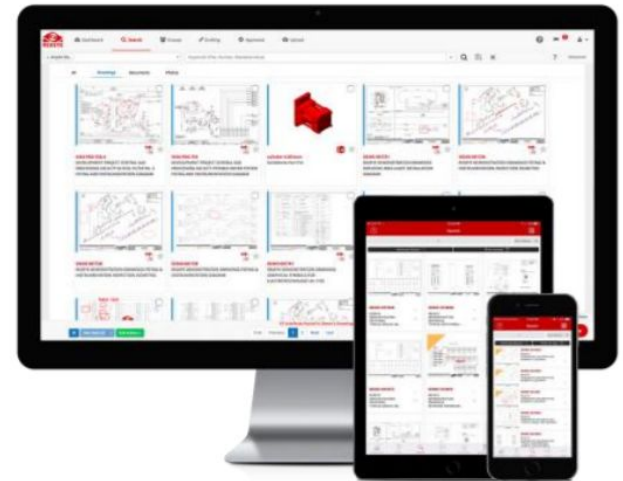
How does it work?

- RedEyeDMS is the first purpose-built cloud and mobile engineering drawing management solution
- Upload and link relevant documents, photos, and drawings together
- Find the right information with a single click
- Changes in the field can be captured in real time
- An asset owner's Single Source of Truth (SSOT) for engineering data



Unique Selling Point / Competitive Advantage?

- Allows changes to be recorded, shared, reviewed, and approved in an easy, efficient, auditable manner



Daupler

USA | TRL 8

SaaS:
OPERATIONS



What challenge does this technology solve?

- Time-intensive and inaccurate incident response and data management



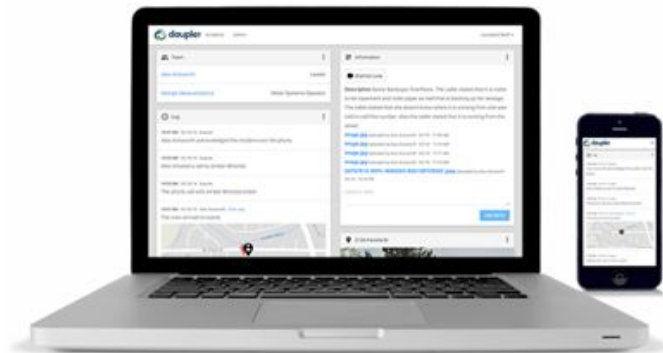
How does it work?

- Incident Response Management System (IRMS) helps utilities expedite their responses to critical issues
- Improves customer engagement with an incident response tracking tool
- Uses machine learning to analyze customer reported issues to look for potential causes
- Partners and integrates with various CMMS providers



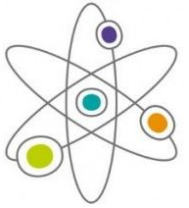
Unique Selling Point / Competitive Advantage?

- Improves customer satisfaction by reducing response times and engaging citizens with a Response Tracker





Additional Resources



Water Action Platform

The group involves over **1100+** members **608** organizations across **88** countries as of August 2020.



- Asset Management
- Chemical Free Treatment
- Communications
- Customer Service
- Digital and AI
- NRW and Leakage
- SDGs
- Technology and Innovation
- WASH Service Affordability
- Wastewater

<https://www.wateractionplatform.com/>



Thank you!

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