The story started in Valencia (Spain)
Water scarcity

- Carbon Footprint & Climate Change
- Water Quality

Customer Satisfaction

Aging workforce & Knowledge Transfer

Reduce Energy consumption

- Water and sanitation: increasing access coverage
- Increasing cost of water treatment

Secure Water Supply

- Reduce leaks and NRW
- Resilience to Extreme Events

Water Quality

Customer Satisfaction

Aging workforce & Knowledge Transfer

Reduce Energy consumption

- Water and sanitation: increasing access coverage
- Increasing cost of water treatment

Secure Water Supply

- Reduce leaks and NRW
- Resilience to Extreme Events
Results of the Digital Transformation Process

From a leading European water utility...
- +130 Years of experience
- +3,000 Employees
- $450M+ Annual Revenues
- 400 Cities Managed
- 30 Water Treatment Plants
- 300 Waste Water treatment Plants

...to a holistic transformation started in 2005...
- Water scarcity and increasing cost of water treatment
- Information siloes between areas and technologies (SCADAs, GIS, CMMS, ERP)
- Generational gap – senior operators with know-how, and younger digital-natives

...to becoming one of the leading international smart water companies.

Smart Water Simplified
10+ bn data points / year connected
400+ clients worldwide

Technology by utilities for utilities

IDRICA Services & Technology Provider for the water cycle
Results of the Digital Transformation Process

Great use cases solving O&M needs but...

**Digital Frankenstein**

Isolated use cases and data management

Before **go-aigua**
Results of the Digital Transformation Process

From siloed applications to a centric smart water platform for the entire water cycle

**Data Centric Architecture**
(unique Data Model)

**After**

- Water & WW Plants
- Smart Metering & Leakage
- Urban floods
- Digital Twin
- Sewer Network
- Irrigation
From January 2023
Digital Twin Components

- GIS
  - Infrastructures
  - Clients
- SENSORS
  - Real-Time
  - Off-line Time
- SCADA
  - Monitoring
  - Remote Operation
- SMART METERING
  - Customer Services
  - Network Operation
- CMMS
  - Maintenance Register
  - Mobile Work Mgmt

Data Centric Platform
Digital Twin evolution in Valencia Metropolitan Area

- **1st Generation** (2007)
  - **Connection with SCADA**
  - Decision Support System

- **2nd Generation** (2012)
  - **Connection with Off-Line Sensors**
  - Enriching Simulation Inputs

- **3rd Generation** (2018)
  - **Integration with Other Systems**
    - Smart metering, O&M, ...
  - Digital Twin of WDN

**DAILY OPERATION**

**PLANNING AND DESIGN**

- **1998**
  - Dynamic Model
  - Emergency Planning

- **1994**
  - Static Model
  - Network Design
Digital Twin in Valencia

Valencia (Metro Area) Water Distribution
Valencia + 51 Municipalities: 1.7 M inhabitants
2 D.W. Treatment Plants
250 km Main + 1200km Distribution (Looped)

Hydraulic Model connected in Real Time
900 km / 47 pumps / 28 tanks / 254 valves
430 pressures sensors / 200 flowmeters / 400k smartmeters
Fed by 20,000 daily readings

→ + 10,000 “virtual sensors”
Application & Benefits

PLANNING TOOL
- Optimal network design
- Contingency planning
- Master Plans for infrastructures
- Maintenance scheduling
- NRW Reduction
- Define behavior of new infrastructures
- Assess network requirements
Application & Benefits

DAILY OPERATIONS

- Operators training
- Hidden failure & anomalies detection
- What-if analysis & future simulations
- Early response to emergencies
- Water quality monitoring & control
- Leak location & energy optimization
- Decision support system
## Results in Valencia

<table>
<thead>
<tr>
<th>Metric</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 hm³ water saved</td>
<td>+18% NRW reduction</td>
</tr>
<tr>
<td>+19% reduction in maintenance cost</td>
<td>+45% improvement in administrative tasks related to field work</td>
</tr>
<tr>
<td>+60% complaint reduction</td>
<td>+15% energy efficiency</td>
</tr>
</tbody>
</table>
Thank you!

Jorge Helmbrecht
Business Development Director
jorge.helmbrecht@idrica.com