Smart Flows:
Real-world Applications of Digital Transformation in Water Management
Slavco Velickov, Global Water Industry Director
IWRA-UfM Webinar • 27 February 2024
Global Top 100 Software Company

FOCUSED ON INFRASTRUCTURE ENGINEERING

39 years in operation

>5,200 colleagues in 40 countries

>1,400 colleagues with doctoral and master’s degrees

39 colleagues in 40 countries

>5,200 colleagues in 40 countries

87% colleagues recommend as a place to work

~$1.1B annual revenue

>194 countries where BSY solutions are in use

$664M in R&D in past 3 years

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>194 countries where BSY solutions are in use

$664M in R&D in past 3 years

290 patents granted or pending

72% Bentley Infrastructure Top 500 Owners

93% ENR Top 250 Engineering Firms

BSY Nasdaq Listed initial public offering September 2020

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Advancing sustainable infrastructure

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Advancing sustainable infrastructure
Digital Solutions
Solving Today’s Water Challenges

Pressure to perform has never been higher, we’ve never had more to do and never had a bigger need to improve efficiency.

1. Need for investment
2. Staff turnover
3. Sustainability
4. Increased regulatory pressure
5. Rising costs
6. Technology & innovation
Digital Technologies (including AI) Are Changing the Future of Water

Reduce nonrevenue water

Improve energy efficiency and CO2 footprint

Reduce service interruptions

Reduce operational costs

Improve capital planning decisions
Bentley’s Digital Twins Solutions For the Water Industry

WaterSight
Water Distribution

SewerSight
Urban Sewer

PlantSight
Plant Infrastructure

Dam Monitoring
Bentley WaterSight
Digital Twin for smart water distribution networks

- Hydraulic Model
- GIS
- SCADA
- Commercial systems
- Meters, AMI, IoT

Network monitoring & anomaly detection
Event & leak management
Automated Water balance
Efficient Pumping Operation
Real-time online simulation
Modeling of emergency events
Rehabilitation & replacement planning
Imagine the Possibilities
Some of the key utility’s goals for improving operational efficiency and cost reduction?

↓ 15%
Reduction in Nonrevenue Water

↓ 35%
Reduction of Customer Service Interruptions

↓ 30%
Reduction in Pumping Energy Costs
# Evides Adopts Smart Water Solutions to Minimize Environmental Impact and Reduce Carbon Footprint

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<tr>
<th>Challenge</th>
<th>Solution</th>
<th>Impact</th>
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<td>➢ Evides provides <strong>clean and safe drinking water</strong> to 2.5 million consumers.</td>
<td>➢ Evides initiated an <strong>energy efficiency project</strong> to optimise pumping station operations and lower fuel requirements.</td>
<td>➢ Developing a digital twin to analyze pumping operations enabled Evides to <strong>achieve energy cost savings of 33%</strong>, equivalent to EUR 300,000 annually.</td>
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<td>➢ Evides was rethinking how to cope with their water supply challenges while <strong>reducing their carbon footprint</strong>.</td>
<td>➢ Using Bentley’s WaterGEMS and WaterSight, they <strong>implemented a digital twin, enabling real-time insights</strong> to water operations and facilitating automation for pumping.</td>
<td>➢ Bentley’s digital twin solution helped <strong>reduce annual CO2 emissions</strong> by 942 tons per year only at Kralingen site.</td>
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<td>➢ Evides sought to <strong>reduce their emissions by optimising the operations</strong> of the pumping stations, lowering fuel needs, while guaranteeing consumer satisfaction.</td>
<td>➢ Evides’ demonstrated <strong>commitment to sustainable development goals</strong>, including the goal for climate action.</td>
<td>➢ Evides will <strong>expand their water digital twin</strong>, incorporating engineering, asset, and operational data to implement a <strong>smarter and more sustainable water system</strong>.</td>
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DEYAK (Water Utility of Kozani, Greece)

Improving monitoring, performance and operations, reducing nonrevenue water and response time to network events

- Unified SCADA data and Hydraulic Model to enable faster assessments and more accurate decision-making about possible system issues and necessary repairs
- 40% less time on pressure management tasks and 50% reduction in repair time
- Improved leak management with 20% less water flowing through the network
Oporto Use Case: Integrated Water Cycle Management

**CHALLENGE**
- Over 20 different software systems to manage their daily life
- No communication among systems and departments
- No capacity to use numerical models in operations

**SOLUTION**
- Digital Twin of Oporto’s Water Cycle management:
  - Water Supply Models, Sewer/Storm and Streams Model
  - Coastal Circulation Model
  - High Resolution Meteorological Model
  - Real time Monitoring, alarms and water audit

**BENEFITS**
- Use of numerical models in Operations
- Integrated platform improved internal workflows
- Accessible anytime, anywhere
- Increased reliability and stability of information produced improved decision making
Oporto Use Case: Integrated Water Cycle Management

Official Results presented by Oporto at SWAN (Smart Water Network forum) Digital Twin Workgroup

:: Main results.

- Mobile employees and real-time management of teams
- Anytime, anywhere access to secure and consistent information
- More engaged and proactive workforce
- Increased infrastructure resilience and preventive maintenance
- Better customer experience
- Higher performance – better operation business KPI’s. We get better every day!
- Water supply interruptions fell 42.9%
- Duration of pipe burst repairs improved 6%
- Volume of NRW dropped by 10.1%
- Duration of sewer and service connection repairs improved 44.5%
- Number of sewer collapses decreased 14.7%
What’s Next …

1. Organize a Digital Workshop with the key Stakeholders to identify potential **Business Outcomes** to get started quickly

2. Identify key **Use Cases** aligned with the Business with budgetary proposal to start Proof of Concept (proof of value) implementation project
Some Thoughts to Conclude…

**Water should be prioritised** at the political level – there is no green without blue.

The road to “net zero” critically depends on water policy and water infrastructure – this should be prioritised during the next investments cycle (2024-29).

**Adoption of digital technologies** should be fostered by all infrastructure-relevant legislative initiatives.

Better sustainability outcomes depend on the ability to derive insights from countless sources of data – through tools like infrastructure digital twins.

**A holistic, forward-looking approach to infrastructure** is needed.

A systems approach to infrastructure is needed across sectors, e.g., energy and water/wastewater challenges are intrinsically linked.
Thank you for your attention!

Contact us for more information:
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For Universities and Research Organizations:
www.education.bentley.com

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