SWAN: Smart Water Networks Forum
BCWWA SCADA / IT Conference
November 21, 2019
Gary Wong, Chairman, SWAN Americas
gwong@osisoft.com
SWAN – Making Water and Wastewater Systems More Intelligent
The SWAN Forum

- The Smart Water Networks Forum (SWAN) is the leading hub for the smart water and wastewater sectors

- A UK-based non-profit, SWAN brings together key players in the water sector to accelerate the awareness and adoption of data-driven technologies in water and wastewater networks worldwide
The Smart Water Hub
We are at the **Tipping Point of Smart Water Adoption**

The Theory of Diffusion of Innovation. Sources: Rogers, Everett and Gladwell, Malcom.
SWAN’s Goals
Build Educational Awareness

**SWAN infographic:** “Smart v. Traditional Urban Water Resources Management”

**Publications:** Journal AWWA, Australian Water Management Review, Journal Water & Sewerage

**Animated clips:** “The Customer Benefits of Smart Water Networks” in English and Spanish
Share Member Knowledge

WASTEWATER NETWORK MANAGEMENT

Leak Detection Case Studies

- Transmission Main Leak Detection in New Jersey (Echologics)
- Successful Acoustic Monitoring in the UK (Syrinix)
- Permanent Leakage Monitoring Benefits in Germany (Gutermann)
- Installing Flow Meters in Asia (ISOL)
- Water Savings in Abu Dhabi (Schneider Electric)
- Drying Up Water Leaks in Halifax (OSIsoft)

(SWAN Interactive Tool, Wastewater Network Management Solution)  (SWAN Research Portal, Leak Detection)
Data-Driven Solutions Meet Human-Driven Resistance

Carla Reid, General Manager
Washington Suburban Sanitary Commission
AFO Technology

AFO cable floats inside PCCP and listens for the “ping” of wire breaks.

When AFO hears a “ping,” the data is recorded and sent to WSSC.
• Invested $21 million in AFO Technology
• Alerted us more than 20 times to major breaks
• AFO Saved $42+ Million
City of Atlanta Dept.
Watershed Management

Torri Martin
Chief of Innovation
Produce Cutting-Edge Research

White Paper: The Social Layer of the Smart Water Journey

Report: Data-Driven Solutions to U.S. Wastewater Challenges

Industry Survey: Big Data & Urban Sewershed Management

White Paper: Benchmarking Quality of Service

White Paper: Communication in Smart Water Networks

SWAN Global Utility Survey
Please rate current challenge level for your utility (Adjusted to a Low-Med-High rating).

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Low Count</th>
<th>Med Count</th>
<th>High Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aging of utility infrastructure</td>
<td>0</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Managing capital costs</td>
<td>2</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Managing operational costs</td>
<td>3</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Justifying improvements/rate requirements</td>
<td>3</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Resilience/Reliability</td>
<td>5</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>IT infrastructure (servers, network, storage)</td>
<td>5</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Data management (databases, visualization and analysis tools)</td>
<td>7</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>Industrial control systems (SCADA, PLCs, DCS)</td>
<td>6</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Aging workforce</td>
<td>3</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>Treatment technology</td>
<td>12</td>
<td>11</td>
<td>7</td>
</tr>
</tbody>
</table>
Has your utility implemented components to store and process Big Data? If YES, when did you implement it?

- 7: More than 4 years ago
- 11: Within past year
- 2: 2 years ago
- 9: 3 years ago
- 1: 4 years ago
How important are the below systems to your utility

<table>
<thead>
<tr>
<th>System</th>
<th>Low</th>
<th>Med</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance metering infrastructure (AMI)</td>
<td>14</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Customer information system (CIS)</td>
<td>9</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Computerized maintenance management systems (CMMS)</td>
<td>2</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>Laboratory information management systems (LIMS)</td>
<td>2</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>Supervisory control and data acquisition (SCADA) system</td>
<td>0</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>Enterprise asset management system</td>
<td>5</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>Surveillance and Responses System (SRS)</td>
<td>14</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>
Which of the following do you consider as part of Big Data? Please select all that apply.
Please rate the importance of each of the following benefits of Big Data analysis will bring to your utility

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Low Count</th>
<th>Med Count</th>
<th>High Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal operation of treatment plants and networks,</td>
<td>3</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Predict system and equipment failure</td>
<td>1</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>Accelerate the speed with which new capabilities and service are deployed</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Decrease expenses through operational cost efficiencies</td>
<td>1</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>Mitigate knowledge loss from aging workforce</td>
<td>1</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Improve workforce management</td>
<td>2</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Extract greater value from existing analytical tools</td>
<td>3</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>Reduce non-revenue water to minimize water and revenue losses</td>
<td>12</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Reduce pollution events</td>
<td>8</td>
<td>9</td>
<td>13</td>
</tr>
</tbody>
</table>
SWAN Americas Alliance

- **Goal:** To accelerate smart water/wastewater development in North and South America through the SWAN Forum’s collective, global industry expertise
  
  - This region’s utilities are very quickly becoming leaders in Smart Water
  - Tailored workshops, specialized webinars, and a central source for smart water information
  - Collaborate with fellow regional utilities and solution providers
  - Only available for SWAN Members
SWAN Americas Alliance Partners
SWAN Americas Alliance – 1st Year Accomplishments

1st Webinar on “Promoting a Data-Enabled Smart Water Future” on Nov. 1st

Water Readiness Guide: Policy recs. for new administration to create a resilient water future

1st Alliance Workshop with Cleantech San Diego, attracting over 200 participants

SWAN Research Portal: A repository of smart water resources

2nd Webinar on “Boosting Smart Water Policy” on June 8th

3rd Webinar on “Delivering Smart Water Solutions in Wastewater Networks” on Sept. 20th

Added strategic partners: Alliance for Water Efficiency, Cleantech San Diego, Current, Global Water Technologies, Global Water Works, IoT Impact Labs, Isle, NACWA, Smart Cities Council, WRF, WE&RF and WEF
SWAN Americas Alliance – 2nd Year Accomplishments

Nov. 2017

2nd Alliance Workshop at Uptake in Chicago focused on digital solutions to Midwest water challenges

March 2018

4th Webinar on “Cyber Security Threats and Opportunities” on March 27th

August 2018

5th Webinar on “Smart Wastewater Solutions: Addressing Stormwater Challenges” on Aug. 5th

Oct. 2018

6th Webinar on “Uncovering Canada’s Smart Water Solutions” on Oct. 22nd

Nov. 2018

3rd Alliance Workshop at the CWWA Annual Conference in Montreal on Nov. 4th

Added strategic partners: Alliance to Save Energy, Cleveland Water Alliance, H2OTECH, Resilient Utility Coalition, Water Online
**SWAN Americas Alliance – 3rd Year Accomplishments**

**May 2019**
- **9th Annual Conference**, “Navigating the Smart Water Journey: from Leadership to Results” in Miami,

**June 2019**
- **7th Webinar** on “The LATAM Smart Water Journey: Three Innovative Case Studies” on June 19th

**Sept. 2019**
- **8th Webinar** on “Machine Learning & AI: Enhancing Water Asset Management” on Sept. 17th

**Added strategic partner:** AWWA
• SWAN partnered with Water Online to publish an e-Book of thought leadership inspired by SWAN’s 9th Annual Conference.

• The 60-page report offers 14 unique insights, informed by the excellent participation and collaboration exhibited at the Conference.

• SWAN Forum members received a FREE copy of the report ($499 value)
SWAN Asia-Pacific Alliance
SWAN APAC Alliance Lead Partners
SWAN APAC Alliance – 1st Year Accomplishments

- **May 2018**: 1st Webinar feat. PUB, Watercare, and Unitywater
- **July 2018**: Smart Water Forum at SIWW focusing on “Smart and Digital Transformation for Water Utilities”
- **Nov. 2018**: 2nd Webinar feat. QUU, Sydney Water, and Coliban Water
- **July 2019**: 1st Workshop hosted by Unitywater in Noosa Heads, Australia
- **August 2019**: 3rd Webinar feat. Maynilad, Ranhill Water Services and Jalur Cahaya Sdn Bhd
SWAN Digital Twin H2O Workgroup
SWAN Digital Twin H2O Work Group

- **Goal:** to accelerate the water sector’s adoption of Digital Twin technology by bringing together global water leaders to help identify and solve relevant utility challenges
  - 1st Workshop in May 2019
  - 2nd Workshop on Nov. 6 2019

**Active Members:** Aquainformatics, AVEVA, Brown & Caldwell, DHI Group, Esri, GlobalWaterWorks, Innovyze, Jacobs, Karmous-Edwards Consulting, North Carolina State University, Taragona, Vandcenter, EmNet, a Xylem brand, Evoqua, GO-Aigua, inCTRL Solutions, KWR, Olea Edge Analytics, OSisoft, UW Milwaukee, Watercare

Learn more: [https://www.swan-forum.com/digital-twin-h2o-work-group/](https://www.swan-forum.com/digital-twin-h2o-work-group/)
Digital Twin Example

Continuous pairing data from multiple sources of the real twin for model calibration and real-time accuracy.

GoAigua visualization of Global Omnium DT in Valencia, Spain and its metropolitan-area water distribution network.
For more information

• Swan Forum
www.swan-forum.com/join

• Swan Americas Alliance
https://www.swan-forum.com/swan-americas-alliance/

• Gary Wong - Gwong@osisoft.com