This presentation premiered at WaterSmart Innovations

watersmartinnovations.com
Digital Transformation of CII Water Management: Real-World Examples, Results and Impacts

From monthly interval data to real-time measurement, analysis, and management

Frank Burns, Founder APANA, Inc. Annikki Chamberlain, Senior Solution Specialist, APANA Inc.
Properties Use Water Outside, Inside and for Cooling

Problems happen.
They can be expensive, damaging, time consuming and hidden.
Costs are spread out, hard to control, and increasing

Water

Sewer

Energy

Staff Time

Service Provider Fees

Asset damage

Reputation

Operation insights
Operational Insights

Water touches many cost areas.

Real time water measurement and analysis shines light on the hidden costs.
Digitization means moving from monthly interval data to real-time water use measurement, analysis, and control.

Frank Burns, Founder APANA, Inc.
Annikki Chamberlain, Senior Solution Specialist, APANA Inc.
Data driven outcomes - automated

**Property Data**
Measure & Analyze in Real-time

**Data Driven Support**
Prescriptive Guidance
- 1st Look
- 2nd Look
- Level 3
- Validation

**Insights**
Reporting drives results
Real World Examples:

• Real-time water management for CII.

• NREL validation study (National Renewable Energy Laboratory)

• Smart City demonstration projects
  – using City owned meters
Controlling Water Use Has Become Integral To Finding Other Hidden Waste

Costco Initial Goals - Reduce Costs

Results & Benefits

- Reduced water use by 22%
- Avoided other expenses like energy, service provider fees,
- Improved inconsistent operational practices
- Proactively managing maintenance of equipment
- Integrating solution into all new construction to replicate savings & operational efficiencies
WATER STEWARDSHIP AT FETZER VINEYARDS

With water scarcity growing in California, we are committed to pursuing a comprehensive approach to water stewardship that allows us to conserve and reduce water use whenever possible. Since 2015, we have decreased our water intensity by almost 25 percent, from 3.65 to 2.75 gallons of water used in the winery per gallon of wine produced, as a result of using water efficiently and continuing to think outside the box about water stewardship.

This 25 percent reduction comes from a combination of innovative new technologies—we use worms and microbes to efficiently treat our wastewater, and use cloud computing to monitor for water leaks—and ongoing, iterative improvements to our operations. These efforts allowed us to exceed our 2020 water reduction goal by 10 percent, and to do so two years ahead of schedule.

CONSERVING A VITAL RESOURCE

At Fetzer Vineyards, our use of technology is an extension of our mission-driven approach to business, integrating innovative solutions into our operations to help reduce our impacts.

In 2016, we began installing more than two dozen smart water meters designed by APANA Inc. As part of APANA’s Industrial Internet of Things solution, the smart water meters and associated technology use data analytics to track our water use patterns in real time, allowing us to quickly spot variances and identify savings opportunities. In the event of an equipment malfunction, the smart technology also enables us to pinpoint and correct the problem before significant water volumes are lost.

A variety of other operational initiatives contributed to our reduced water footprint, including the installation of waterless urinals and the ongoing use of peracetic acid in the winery, which eliminates the need for a second rinse during sanitation. Using worms and microbes in our BioFiltro BIDA® system for wastewater treatment is more energy-efficient than earlier wastewater treatment technology, and upgrades to our centrifuge system to recirculate cooling water reduce the water required during a key winemaking process. And finally, our new bottling lines installed in 2017—which increase efficiency and packaging flexibility—came with a secondary benefit of reducing the water volume required for sanitation processes.

Water intensity figures represented as gallons of water used per gallon of wine produced.
RESULTS SUMMARY

- Identified operational process improvements, provided real-time notifications
- Reduced pool water consumption by almost 14,400 gallons per day (37%)
- Resulting annual savings from reduced heating requirements: 900 MMBtu
- Embedded system energy savings: over 35,000 kWh
- Hot water loops have high baseload usage – further investigation needed
Spokane: landscape water use example

Data driven prescriptive guidance result

Gallons per day (gpd) of water use

- 58,000
- 37,461
- 23,727

60% save
The Water Use Profile
APANA monitors water use like a doctor monitors a heartbeat. This data, graphed over a day, creates your Water Use Profile.
Reading the Profile

The **Water Use Profile** shows the operational performance of the building. Compare the actual use to what you expect for the time of day, and you will see things..
Seeing Waste

If the water use does not make sense given the time of day, it is probably waste.
Stopped a 32 gal/min (46,000 gal/day) event inside of commercial irrigation system. This one would have run for days.
Landscape Module - AZ
Landscape Module - AZ

46,000 gallons/day

920

50+

N Post St.
8,500 gal/day Hot Water Leak

Location alerted and guided to find a pressure relief valve discharging 6 gal/min of hot water into a hidden drain in a mechanical room.

Plumber fixed the problem quickly. Water, Sewer and energy saved.
Building Module

50,000 gal/day waste event

EVENT
Hidden toilet failure.

MINUTE BY MINUTE WATER USE PROFILE

Consumed Fri, Mar 23, 2018

16,270 gal

Alert Sent
Waste Stopped

3hrs
Operational Waste
Alerted and stopped

![Graph showing operational water waste](image)

**Alert Sent**
**FIXED**
Event Identified
Location manager turns water on full blast – Destruction avoided.

Why one-minute interval data?

Event Identified
Event Validated
Fix Validated

Location manager turns water on full blast – Destruction avoided.
Prescriptive Guidance
Via AUTOMATED ALERTS
Cooling Tower Failure (evaporative condenser)

Mech/Electrical:
Cooling Tower Waste Event 11,500 gal/day
93,000 gal/day Contractor Error

“they were just here, everything is fine”
Location Manager, 13:35

“this would have run all month”
Location Manager, 19:20
Task 2: Field Validation

3. Validate APANA system response to an abnormal water event
   • The APANA system correctly captured and reported several real excessive water use events during the test period and provided direction to WalMart management for correcting the faults.
   • Manual operation of the portable evaporative cooler resulted in multiple high (3-8 gpm) water events and the APANA system quickly notified the WalMart staff during each event.
Task 2: Field Validation

3. Validate APANA system response to an abnormal water event
   - NREL simulated a large leak in the auto center
   - APANA correctly identified and reported the event
How to solve the water crisis?
How to make more water

Supply

Demand

Eliminate waste $
TRAIN EVERYONE! vs MEASURE > Report > Guide
TRAIN EVERYONE! vs MEASURE > Report > Guide

Ave Gal/Day


STUDY 50+page Report

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TRAIN EVERYONE! vs MEASURE > Report > Guide

Measure so it is meaningful
AMI Data or Real Time Data
Digitization means moving from monthly interval data to real-time water use measurement, analysis, and control.

Thank you

Frank Burns, Founder APANA, Inc.
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AROUND-THE-CLOCK VISIBILITY

Water Softener Regeneration Cycle Example

**HEALTHY**

- Backwash Rinse Brine

**FAILURE**

- No Brine
- Too Much Brine
- No Rinse
- Total Fail
Digitization
Enterprise/ City Scale Insights and function

Locations

Executives

Reporting
Business Intelligence
Executive KPI’s

Normalize
Drive performance
Regulate
APANA® is the inventor of the Intelligent Water Management Platform™

APANA® automates real-time water use measurement and analysis

Delivers cost control and operational insights for properties, campuses, and organizations.

NREL Validated 2019.

Commercial water and wastewater domain experts since 1994.

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