

# EXPLORING UTILITY DIGITAL TRANSFORMATIONS

October 1, 2024

# Today's Agenda

Webcast Housekeeping

WRF Introduction

SWAN Introduction

Jeanna Long, Woodard & Curran

Flavio Silva, Corsan

Panel Q&A

# Housekeeping

- Submit questions through the question box at any time. We will do a Q&A after both presentations are complete.
- Slides and a recording of the webcast will be available at [www.waterrf.org](http://www.waterrf.org).
- You can download the slides now under Event Resources on the bottom left of your screen.
- A certificate of completion will be automatically generated after the webcast. Any questions, please contact Michelle Suazo at [msuazo@waterrf.org](mailto:msuazo@waterrf.org).
- Please stay until the end to fill out a quick survey.



## OUR PURPOSE

To advance the science of water to improve the quality of life for all communities.

## OUR VISION

The science and knowledge we generate allow the water sector to provide high-quality, safe, accessible, and affordable water services that contribute to healthy, resilient communities and a sustainable global environment.

## OUR MISSION

To help our subscribers discover opportunities and solve problems by delivering actionable water research to meet the needs of the communities they serve.



# What does The Water Research Foundation do?

Identify, prioritize and fund research for the water sector.

KNOWLEDGE

Accelerate the adoption of new technologies in the water sector.

CONNECTIONS

INNOVATION

RESULTS

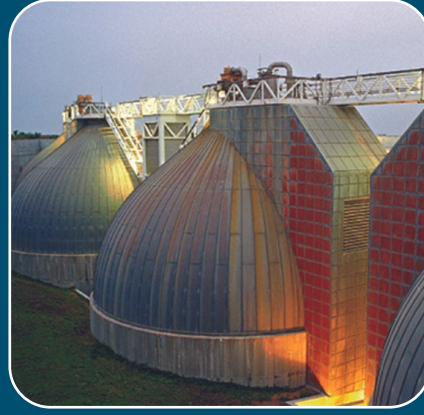
Convene experts and sector representatives to identify and collaborate on priority water research.

Educate decision-makers on the science of water.

*advancing the science of water*







## Healthy Communities & Environment

- Holistic Watershed Management & Integrated Planning
- Monitoring Tools at Watershed & Sewershed Scale
- Receiving Water Quality Management

## Treatment Innovation & Optimization

- Treatment & Process Optimization
- Nature-based Solutions
- Diversifying Water Systems

## Efficient Resource Use & Recovery

- Energy Efficiency, Intensification & Resource Recovery
- Climate Change Mitigation
- Nutrient Removal & Recovery
- Solids Management

## Resilient Infrastructure

- Asset Management
- Distribution System Integrity & Water Quality
- Collection Systems Integrity & Water Quality Impacts

## Utility Operations & Management

- Water Resources Planning
- Workforce Management
- Financial Management

Climate Risk Assessment & Adaptation, Communication, Environmental Justice **Digital Transformation**

# PROJECT 5189: QUANTIFYING THE IMPACT OF ARTIFICIAL INTELLIGENCE/MACHINE LEARNING- BASED APPROACHES TO UTILITY PERFORMANCE

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Do you have an AI/ML initiative at  
your organization? Share your  
experience here!



# Welcome to SWAN

## Reinventing our water future.

The Smart Water Networks Forum (SWAN) is the leading, global smart water hub.

Founded in 2010, SWAN is uniquely focused on increasing the awareness and acceleration of smart, data-driven solutions in drinking water, wastewater, and stormwater networks worldwide.

By aligning industry thought leaders and fostering inclusive collaboration, we have become the driving force in proactively influencing the smart water sector.

Questions: Reach out to  
[maddy@swan-forum.com](mailto:maddy@swan-forum.com)





# SWAN Members

Global leaders in advancing smart water worldwide.

SWAN is home to diverse industry leaders across key audiences. Through regional and global collaboration, SWAN Members are proactively influencing the water sector and creating a smarter, more resilient water future.

We provide a platform for progress and collaborative space for global curious minds to share information, knowledge, and solutions.



# Collaborative SWAN Alliances/Work Groups



Est. in 2015, this Alliance is home to diverse utility & industry thought leaders shaping smart water across the Americas.



Initiated in 2017, this Alliance brings together utility and industry smart water thought leaders across APAC.



Launched in 2019, the EA consists of progressive, regional industry leaders advancing the smart water sector.



A recent initiative, this Alliance is driven by regional leaders working on smart water projects in this emerging region.



Formed 2019, this is a global Work Group of ecosystem thought leaders mapping digital twin strategy and implementation.



Born 2019, this affiliate connects young prof. with smart water opportunities, from mentoring to upskilling.



# SWAN Americas Alliance Structure

## Education

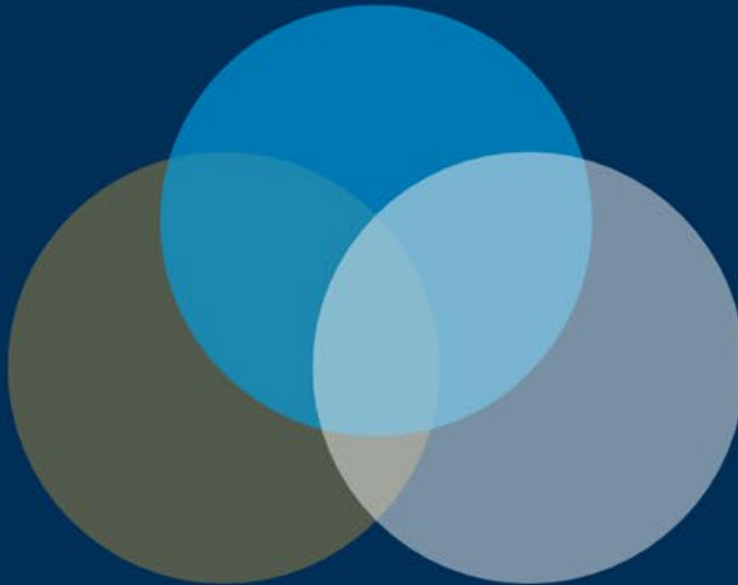
(People, Processes & Technologies)

## Engagement

(Many Members, One Flock)

## Execution

(Guidance, Research & Tools)





SWAN AMERICAS

# Research Project

Enhancing Utility Operations through  
IT/OT Collaboration



Share your IT/OT Case Studies  
(Open to SWAN Members)







# 5<sup>TH</sup> SWAN AMERICAS WORKSHOP

PHOENIX, ARIZONA

**"Smart Oasis:  
Doing More with Less"**

**January 16 - 17, 2025**

📍 Sheraton Phoenix Downtown



# Today's Presenters



**Jeanna Long, PhD**  
**National Digital Innovation Leader**  
**Woodward and Curran**



**Flavio Silva**  
**Electrical and Water Resilience Engineer**  
**Corsan**

# BUILDING A FUTURE-READY UTILITY, ONE STEP AT A TIME

Jeanna Long, PhD

# Digital Transformation in Utilities

Building a future-ready utility, one step at a time



## Focus on Your People and Processes

Streamline data processes for immediate impact, efficiency gains, and early wins



## Build a Solid Data Foundation

Collect high quality data and centralize for informed decision making and regulatory compliance



## Leverage Advanced Technologies

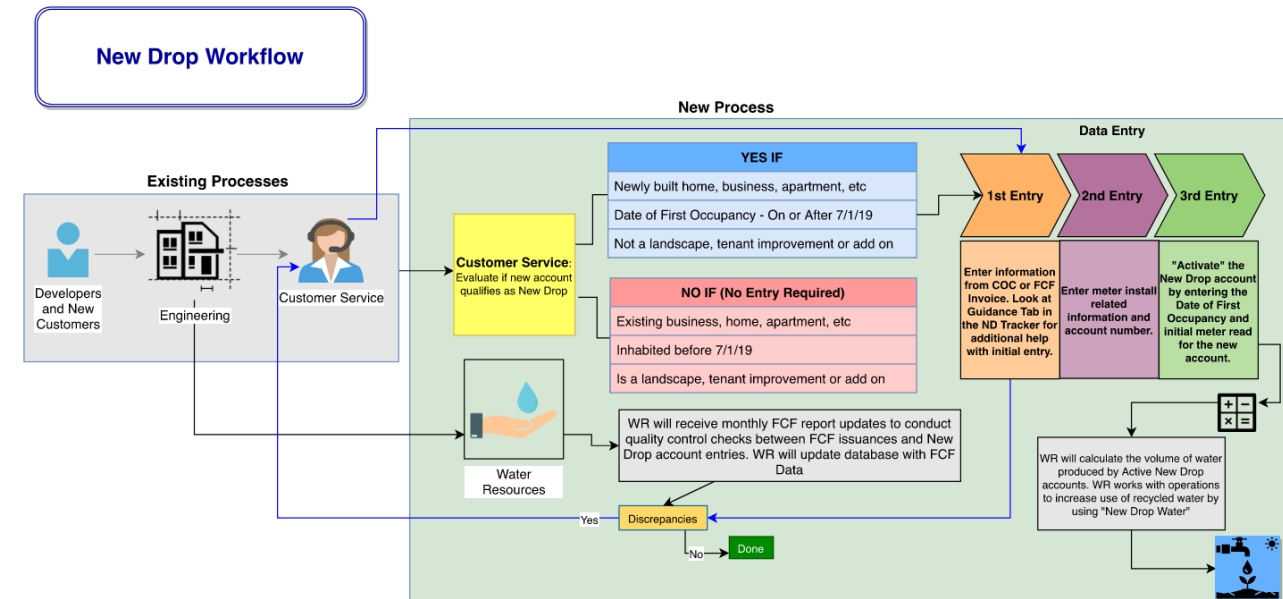
Explore AI/ML possibilities to support predictive decision support, workforce enhancement, optimization, etc.

# Partnering for digital transformations nationwide



# Case Study 1: Modernizing Cross-Departmental Access to Data

- Enhance the process for internal access to data
- Automate demand calculations
- Meet regulatory reporting requirements
- Adapt to future program changes



Occupied

Active/Occupied Accounts

488

Y

Back to Summary

Please make sure to enter the Project Type. It's what allows WR to estimate indoor usage for each account. Thank You

Customer service. This is your section to fill out (Second Entry). I've entered all the accounts that Engineering has on file to reduce the amount of data input you'll have to do. However, if you notice an account that is not on this list, please highlight it in red so that I can do some investigating. Also, please fill in info into the Engineering Section if it's available to you and you see that it's blank. It would be greatly appreciated. Thank you for all your help!!

Location Add

Certificate Number

Street Number

Street Name

Project Name

Project Type

Project Description

Purveyor

# of Dwelling Units

Square Footage

Meter Install Date

Installation Meter Read

Master Metered?

Meter Size (in)

Account No

Meter No

CF 20-0038

Allento - Arista

SF

SCWD

6/11/2020

0

No

1.00

2409-01

87112485

CF 20-0038

Allento - Arista

SF

SCWD

6/11/2020

0

No

1.00

2410-01

87112488

CF 20-0038

Allento - Arista

SF

SCWD

6/11/2020

0

No

1.00

2411-01

87112487

CF 18-0148

Live Oak Estates

SF

SCWD

12/12/2005

0

No

1.00

10039-01

65651891

CF 18-0181

Plum Canyon - Avalon

SF

SCWD

10/23/2019

0

No

0.75

33348-01

84072766

CF 18-0170

Allento - Arista

SF

SCWD

4/14/2018

0

No

1.00

2612-01

83227248

CF 18-0170

Allento - Arista

SF

SCWD

8/16/2018

0

No

1.00

2614-01

83227245

CF 18-0170

Allento - Arista

SF

SCWD

8/16/2018

0

No

1.00

2616-01

83227247

CF 18-0173

Allento - Tierno

SF

SCWD

9/17/2018

0

No

1.00

2376-01

84750548

CF 18-0173

Allento - Tierno

SF

SCWD

9/17/2018

0

No

1.00

2377-01

84750548

CF 18-0189

West Creek - Paloma

MF

Attached Condo

VWD

5/29/2019

0

No

0.75

41917301

19067125

CF 18-0189

West Creek - Paloma

MF

Attached Condo

VWD

5/29/2019

0

No

0.75

41917301

19067125

CF 17-178

Com

6/18/2020

25,990

No

1.00

150001300

19851563

CF 18-0181

Skyline Ranch - Sola

SF

SCWD

11/6/2018

0

No

1.00

31017-02

84363764

CF 19-0040

West Creek - Avanti

SF

Detached Condo

VWD

4/30/2019

0

No

0.75

41980301

8474846

CF 18-0190

Allento - Arista

SF

SCWD

9/27/2018

0

No

1.00

2656-01

84750555

CF 18-0189

West Creek - Paloma

MF

Attached Condo

VWD

5/29/2019

0

No

0.75

41918301

19067083

CF 18-0193

Plum Canyon - Avalon

SF

SCWD

5/14/2019

0

No

1.00

33523-01

84072783

CF 18-0193

Plum Canyon - Avalon

SF

SCWD

5/14/2019

0

No

1.00

33530-01

85762180

CF 18-0193

Plum Canyon - Avalon

SF

SCWD

5/14/2019

0

No

1.00

33531-01

84072780

CF 18-0193

Plum Canyon - Avalon

SF

SCWD

5/14/2019

0

No

1.00

33530-01

85762181

CF 18-0193

Plum Canyon - Avalon

SF

SCWD

5/14/2019

0

No

1.00

33532-01

84072781

Summary Page

NO Dashboard

Dash Formatter

NO Tracker

Reference Page

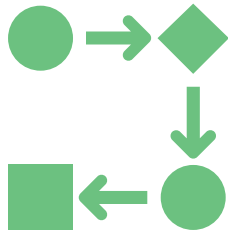
NO Consent

ECF Guidance





# Internal challenges faced: Improving access to high-quality data



Work-from-home posed significant challenges to sharing data across departments




Data files passed between departments relied on manual copy/paste into their tracking workbook



Program is subject to strict and timely regulatory reporting

# Replacing spreadsheets with a web-based platform

 **SCV WATER** NEW DROP PORTAL

[yourscvwater.com](#)

Logout

Home

Projects

Reference

Reports

Admin

Profile

Projects

List ViewMap View

Search:

Filter By: Month Uploaded 

All Months

Project Type 

All types


Occupied 

Any

Steps 

2

| Certificate Number | Street Number | Street Name | City           | Zip   | APN          | Applicant            | Project Name           | Project Type | Purveyor | Alert | Entry Step |
|--------------------|---------------|-------------|----------------|-------|--------------|----------------------|------------------------|--------------|----------|-------|------------|
| CF 18-0182         |               |             | Canyon Country | 91351 | 2812-010-010 |                      |                        | SF           | SCWD     |       | 2          |
| CF 18-0182         |               |             | Canyon Country | 91351 | 2812-010-010 |                      |                        | SF           | SCWD     |       | 2          |
| CF 19-0022         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/18/19      | SKYLINE RANCH          | SF           | SCWD     |       | 2          |
| CF 18-0182         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/18/19      | SKYLINE RANCH          | SF           | SCWD     |       | 2          |
| CF 19-0022         |               |             | Canyon Country | 91351 | 2812-010-010 | NOT IN THE NS SYSTEM |                        | SF           | SCWD     |       | 2          |
| CF 18-0182         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/26/19      |                        | SF           | SCWD     |       | 2          |
| CF 19-0022         |               |             | Canyon Country | 91351 | 2812-010-010 | NOT IN THE NS SYSTEM |                        | SF           | SCWD     |       | 2          |
| CF 18-0182         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/24/19      | SKYLINE RANCH          | SF           | SCWD     |       | 2          |
| CF 19-0022         |               |             | Canyon Country | 91351 | 2812-010-010 | NOT IN THE NS SYSTEM |                        | SF           | SCWD     |       | 2          |
| CF 18-0182         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/27/19      |                        | SF           | SCWD     |       | 2          |
| CF 19-0022         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/20/19      |                        | SF           | SCWD     |       | 2          |
| CF 19-0108         |               |             | Canyon Country | 91351 | 2802-047-012 |                      | SKYLINE RANCH-CELESTIA | SF           | SCWD     |       | 2          |
| CF 19-0022         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/20/19      |                        | SF           | SCWD     |       | 2          |
| CF 19-0022         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/28/19      |                        | SF           | SCWD     |       | 2          |
| CF 19-0022         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/20/19      |                        | SF           | SCWD     |       | 2          |
| CF 19-0108         |               |             | Canyon Country | 91351 | 2802-047-015 |                      | SKYLINE RANCH-CELESTIA | SF           | SCWD     |       | 2          |
| CF 19-0067         |               |             | Canyon Country | 91351 | 2802-044-009 |                      | SKYLINE RANCH          | SF           | SCWD     |       | 2          |
| CF 19-0108         |               |             | Canyon Country | 91351 | 2802-047-017 |                      | SKYLINE RANCH-CELESTIA | SF           | SCWD     |       | 2          |
| CF 19-0108         |               |             | Canyon Country | 91351 | 2802-047-019 |                      | SKYLINE RANCH-CELESTIA | SF           | SCWD     |       | 2          |
| CF 19-0014         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/14/19      | SKYLINE RANCH-LYRA     | SF           | SCWD     |       | 2          |
| CF 19-0014         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/20/19      | SKYLINE RANCH-LYRA     | SF           | SCWD     |       | 2          |
| CF 19-0014         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/13/19      | SKYLINE RANCH-LYRA     | SF           | SCWD     |       | 2          |
| CF 19-0014         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/20/19      | SKYLINE RANCH-LYRA     | SF           | SCWD     |       | 2          |
| CF 19-0014         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/18/19      | SKYLINE RANCH-LYRA     | SF           | SCWD     |       | 2          |
| CF 19-0014         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/25/19      | SKYLINE RANCH-LYRA     | SF           | SCWD     |       | 2          |
| CF 19-0014         |               |             | Canyon Country | 91351 | 2812-010-010 | MOVE IN 6/27/19      | SKYLINE RANCH-LYRA     | SF           | SCWD     |       | 2          |

POWERED BY 

# Streamlining the import and quality control of data

The screenshot displays the SCV Water New Drop Portal interface. A modal window titled "Import FCF Report" is open, allowing users to upload and configure FCF reports. The modal includes fields for "Report Month" and "Report Year" (both dropdown menus), a "Project File" input field with a "Browse" button, and "Upload" and "Cancel" buttons at the bottom.

The background shows a "Projects" table with the following columns: Certificate Number, Street Number, Street Name, City, Zip, APN, Applicant, Project Name, Project Type, Purveyor, Alert, and Entry Step. The table contains multiple rows of project data, including entries for Canyon Country and Skyline Ranch.

At the top of the portal, there is a navigation bar with the SCV Water logo, "NEW DROP PORTAL", a user link "yourscvwater.com", and a "Logout" button. A sidebar on the left contains links for Home, Projects, Reference, Reports, Admin, and Profile. The main header area includes "Add Project" and "Import FCF Report" buttons, along with search and filter options.

# Tracking the lifecycle of the project

[illegible]

# Automating demand calculations

SCV WATER NEW DROP PORTAL

yourscvwater.com

Logout

Home

Projects

Reference

Reports

Admin

Profile

Reference

Indoor Water Use

Calculation Method

Calculation Method UWMP Estimates Current Default

Indoor Water Use Demand

| Category                        | Description    | Water Use | Units       | Equivalent Interior Use |
|---------------------------------|----------------|-----------|-------------|-------------------------|
| Residential Single Family       | gpd/DU         | 159.90    | parcel(s)   | 1.00                    |
| Residential Multi Family        | gpd/DU         | 119.90    | unit(s)     | 0.75                    |
| General Commercial              | gpd/sq ft      | 0.12      | square feet | 0.75                    |
| Non-Residential High Use        | gpd/bldg sq ft | 1.42      | square feet | 8.86                    |
| Non-Residential Medium Use      | gpd/bldg sq ft | 0.18      | square feet | 1.12                    |
| Non-Residential Very Low Use    | gpd/bldg sq ft | 0.02      | square feet | 0.15                    |
| Schools                         | gpd/student    | 12.79     | student(s)  | 0.08                    |
| Hotels / Motels / Nursing Homes | gpd/room       | 75.15     | room(s)     | 0.47                    |

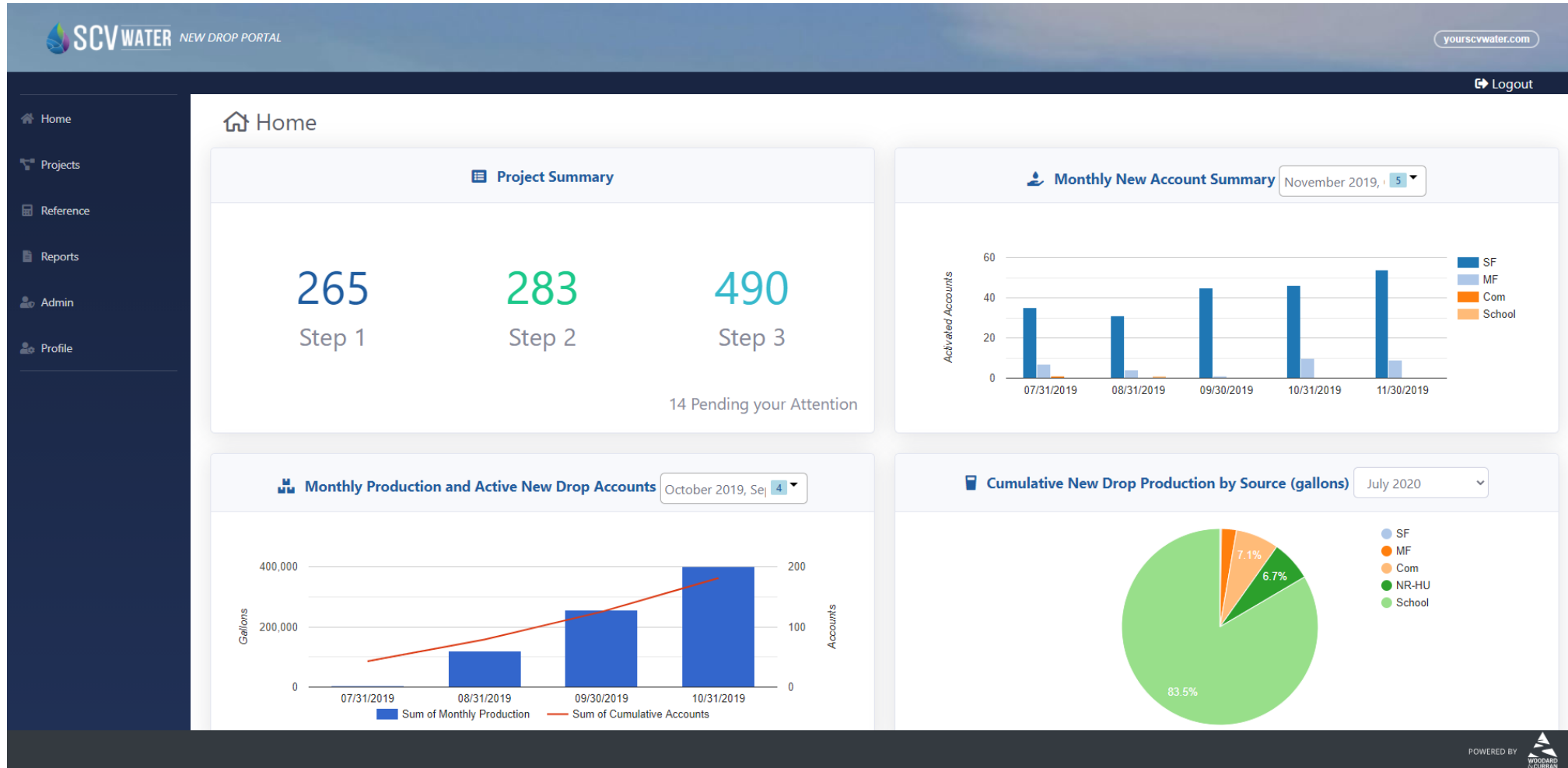
Save Update Projects

POWERED BY

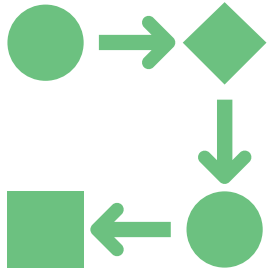
WOODWARD CLIFTON



# Monitoring and reporting on program status



# Outcomes and benefits realized



All departments could access the data in a user-friendly manner



Data quality improved through automation



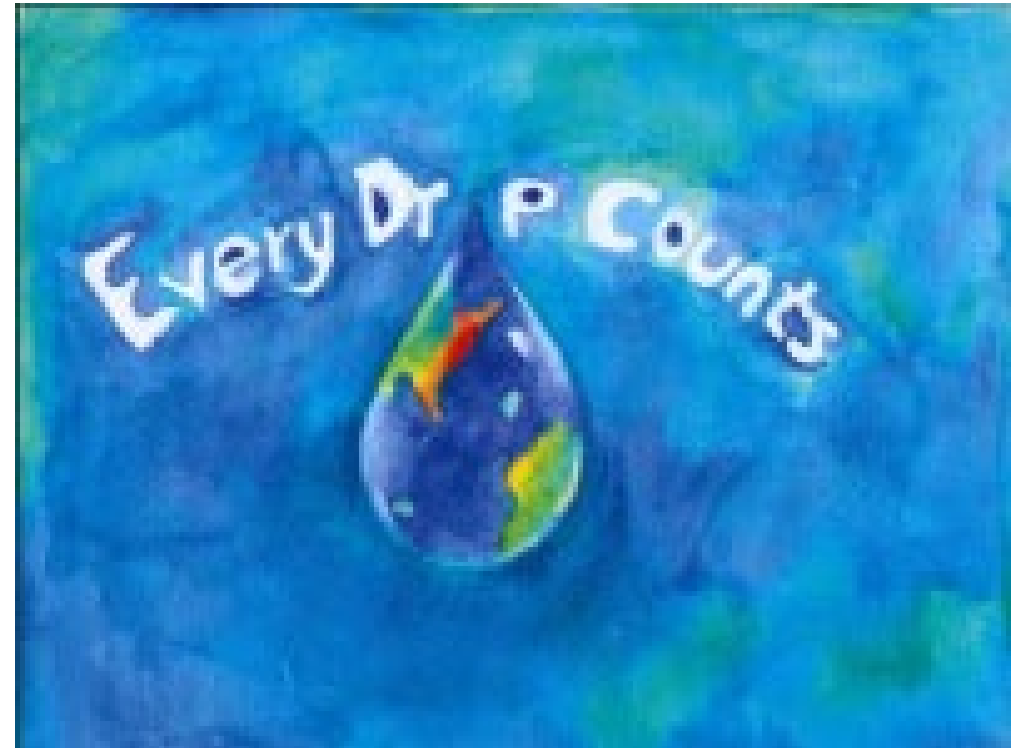
Streamlined report development

# Case Study 1: Lessons learned and key takeaways

- **Match the technology to the process:** User-centric design was key to accessibility and efficiency
- **Remote-work readiness is important:** You never know when something can happen! Traditional approaches can cause bottlenecks.
- **Automate whenever possible:** Automation reduces human error and saves time
- **Support future program enhancements:** Consider and plan for possible changes (don't code yourself into a box). Implement a modular and flexible design whenever possible.

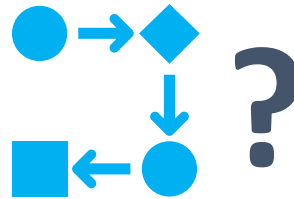
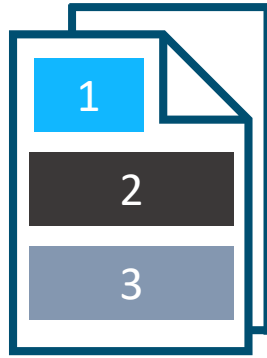
## Case Study 2: Forward-Thinking Approach to Water Conservation Program Management

- Digitalize processes for more efficient operations and better resource allocation
- Improve customer experience and accessibility to increase engagement
- Enhance regulatory compliance
- Create foundation for future use of data





# Have you ever tried applying for a rebate program?





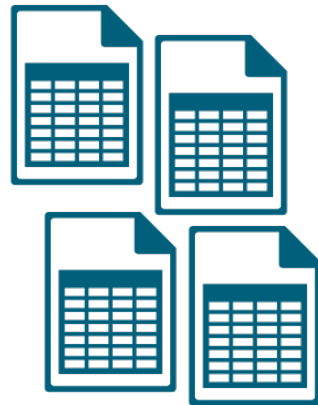
# Internal challenges faced: Streamlining administrative workflows



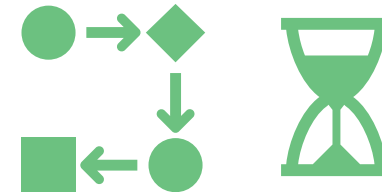
Applications come in on paper or PDF



Customer communication tracked through email or phone



Separate programs tracked in different spreadsheets



Administrative workflow was hard to track and had room for efficiency improvements

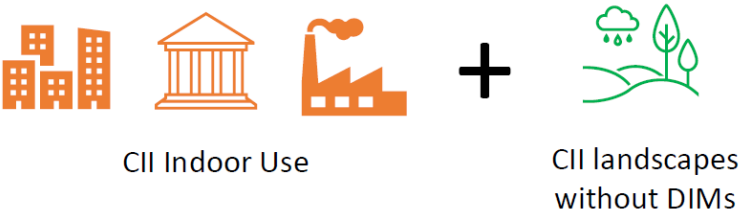
# External challenges faced: Navigating regulatory requirements

## Regulatory Drivers to be ever more efficient

*In California:*



& Performance Measures for:

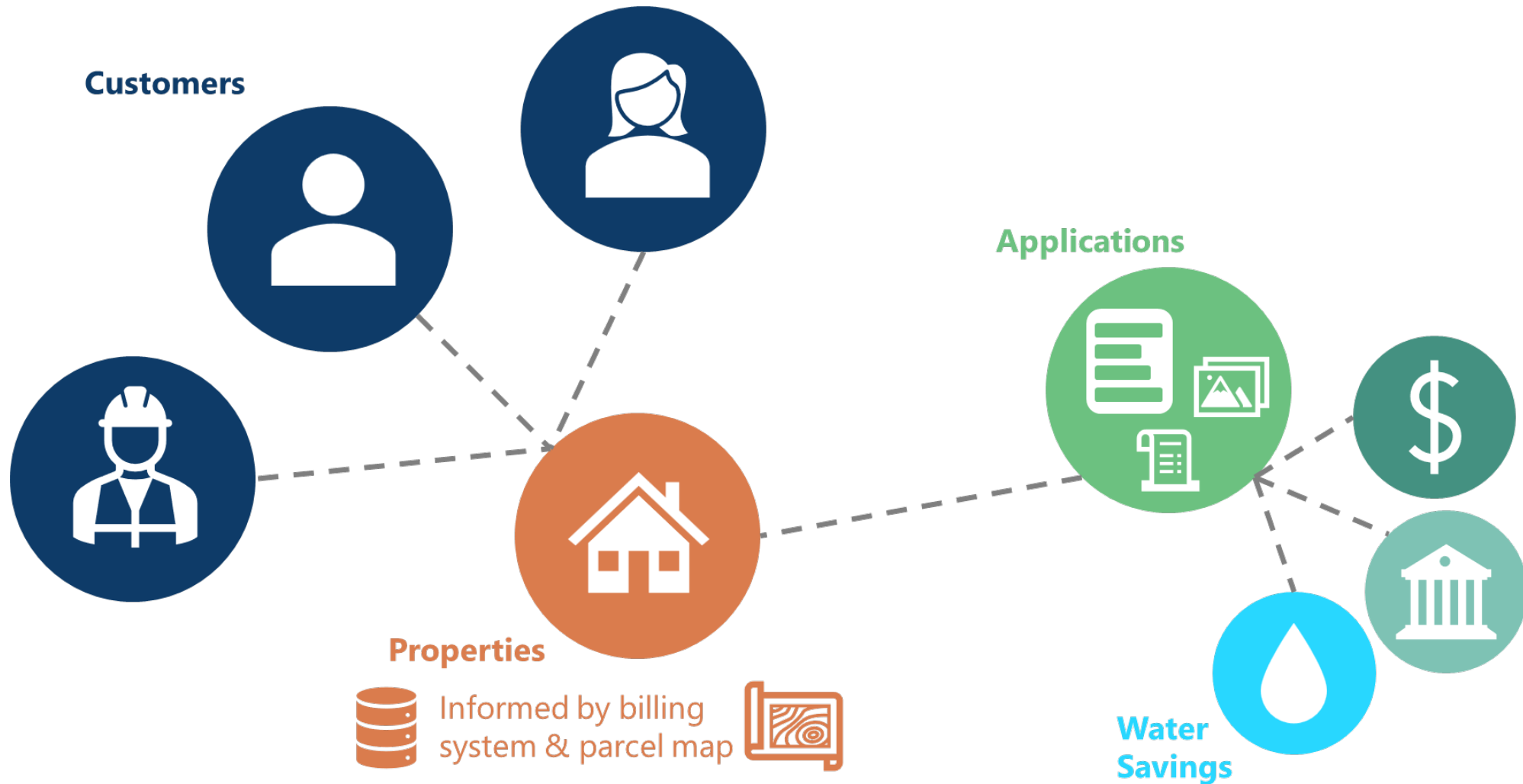


## Periodic Drought




## Water Shortage Contingency Plan & Water Shortage Response Actions

# Data structure: Design dictated by user requirements



# Enhancing the customer experience

 ACWD WATER SAVINGS CENTER

Logout


My Applications

Start Application


My Profile

Contact Us - Contact our Water Use Efficiency team by calling (510) 668-4218 or by emailing us.  
[www.acwd.org](http://www.acwd.org)

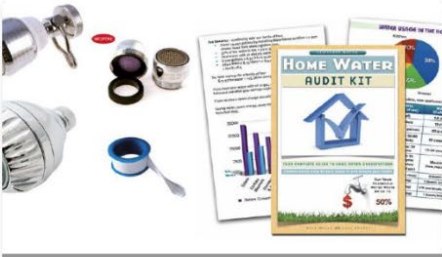
Start Applications



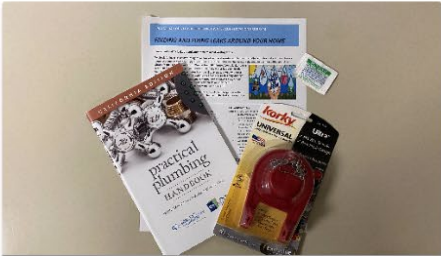
Single-Family Residential Weather-Based Irrigation Controller Rebate




Rain Barrel Rebates




Free Water Conservation Kit




Free Fix a Leak Kit





Do-It-Yourself Residential Home Water Use Survey



Residential Weather-Based Irrigation Controller Rebate








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# Dynamically managing programs, applications, and workflows

ACWD WATER SAVINGS CENTER

Home

Applications

Programs

Customers

Properties

Admin

Profile

[www.acwd.org](http://www.acwd.org)

Programs

Select Program to ConfigureWater Conservation Kit

Add New ProgramExport Program Specification

Program Configuration

















Workflow Configuration

Application Fields

Document Uploads

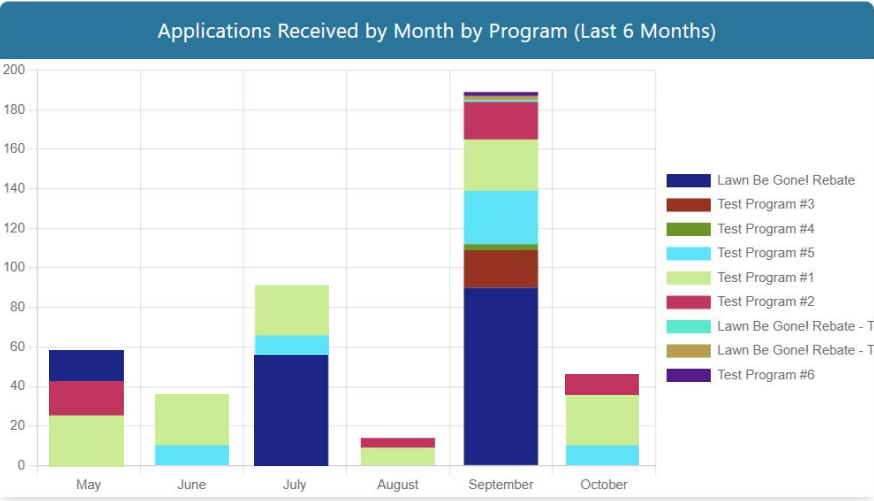
Email Templates

Application FieldsAdd

| Field Name                               | Field Type | Application Order | Required                            | Actions   |
|--|------------|-------------------|-------------------------------------|---|
| Phone Number                             | STRING     |                   | <input checked="" type="checkbox"/> |       |
| Email Address                            | STRING     |                   | <input type="checkbox"/>            |       |
| Do you live in a Homeowners Association? | DROPDOWN   |                   | <input checked="" type="checkbox"/> |       |
| Homeowners Association's Name            | STRING     |                   | <input checked="" type="checkbox"/> |       |
| Number of Bathrooms in Home              | DROPDOWN   |                   | <input checked="" type="checkbox"/> |   |
| Age of Home                              | DROPDOWN   |                   | <input type="checkbox"/>            |   |
| Information about fixtures in your home  | CHECK      |                   | <input type="checkbox"/>            |   |
| How did you hear about this offering?    | STRING     |                   | <input type="checkbox"/>            |   |

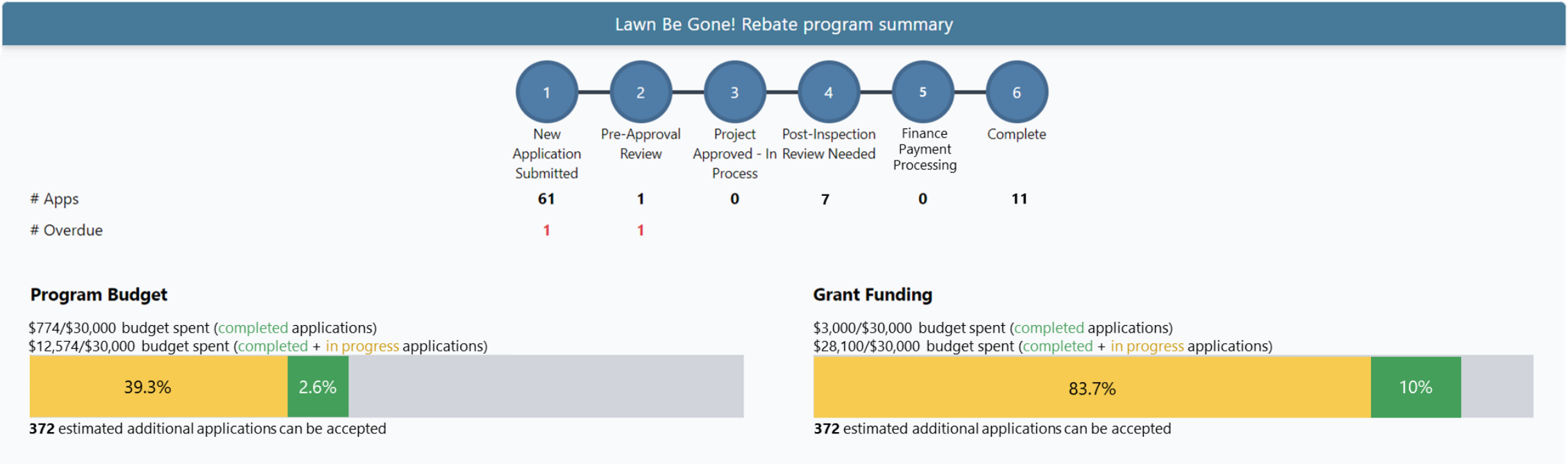


# Monitoring program status and workloads through dashboards



### Current Staff Assignments for In Progress Applications

| Staff Name          | Count of Applications |
|---------------------|-----------------------|
| Chris Hewes         | 4                     |
| Megan Maurino       | 2                     |
| Gisselle Delgadillo | 1                     |
| No Staff Assigned   | 25                    |

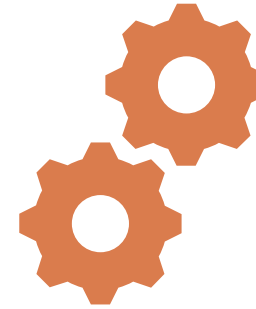




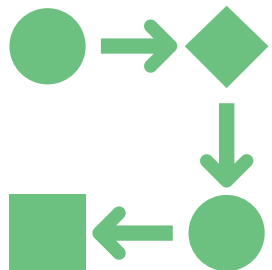
# Outcomes and benefits realized



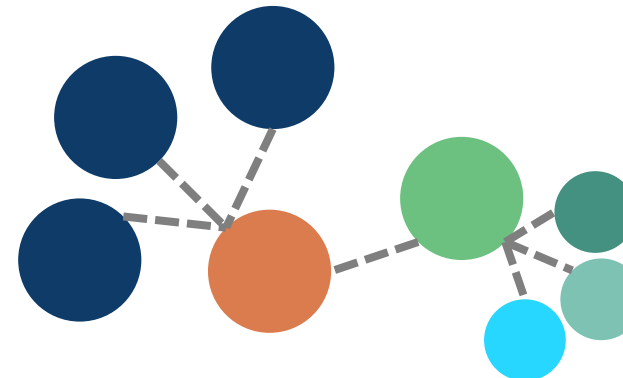
Centralizes and simplifies the experience for customer & all tracking and reporting for staff



Fully managed by the agency without consultant input as program expands



Workflow is flexible to handle various administrative approval processes



Robust, flexible data structure supports more than just conservation rebate application intake

## Case Study 2: Lessons learned and key takeaways

- **Centralize data:** Centralized data structure is essential for reporting across programs
- **It's about the people:** Designed for the customer and staff
- **Technology needs to be aligned with the process:** Standardize as much as possible without sacrificing ease-of-use
- **Create a foundation for the future:**
  - Track the water savings impacts of individual applications through time to project future savings for new and nonparticipating customers
  - Inform future program investments and track ROI
  - Make better decisions – will this program accomplish what we want?

# Digital transformation can start anywhere in your utility

- Remember it's a journey...
  - Focus on your people and processes to find efficiency gains now
  - Build your solid data foundation
  - Then leverage advanced technologies



*Created with Copilot 2024*

# SMART GRID AND SMART WATER NEXUS, DIGITAL TWIN PROJECTS IN UTILITIES.

October/2024 – Flavio Eduardo Soares e Silva

# Who am I ?

## Experience:

2023 – PUCRS - PROFESSOR

2018 - CORSAN – 6 YEARS ;

2017 - Government of the State of RS ;

2014 - AES/RGE SUL – Telecom - Project Start and Master's Degree – 4 YEARS;

2013 - SIAE Microeletrônica – Company that supplies MW radios to TIM;

2012 - TIM;

2010 - Ericsson;

2009 - Nokia Siemens Networks (Aircom);

2007 - Claro;

2005 - TIM (Internship);

2004 - Datacom (Internship);

2003 - Microelectronics Group – UFRGS (IC Scholarship);

2002 - Embrasul (Internship);



GOVERNO DO ESTADO  
RIO GRANDE DO SUL



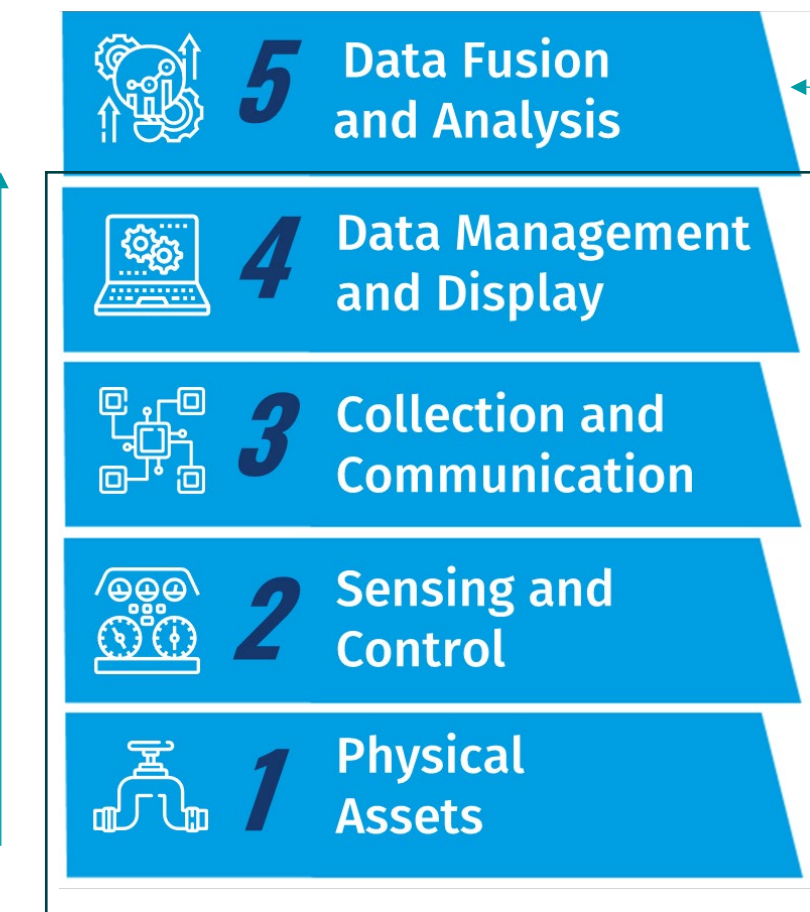
# Corsan

Companhia Riograndense de Saneamento was created on December 21, 1965 and officially installed on March 28, 1966, this being the official date of its foundation. The company that emerged faced the challenge of providing Rio Grande do Sul and its population with a better quality of life, and the image of the water carrier, which precariously supplied the population at the beginning of the century, has definitely remained in history. Currently, Corsan supplies around 6 million people from Rio Grande do Sul. This represents about 2/3 of the population of the State, distributed in 317 municipalities.

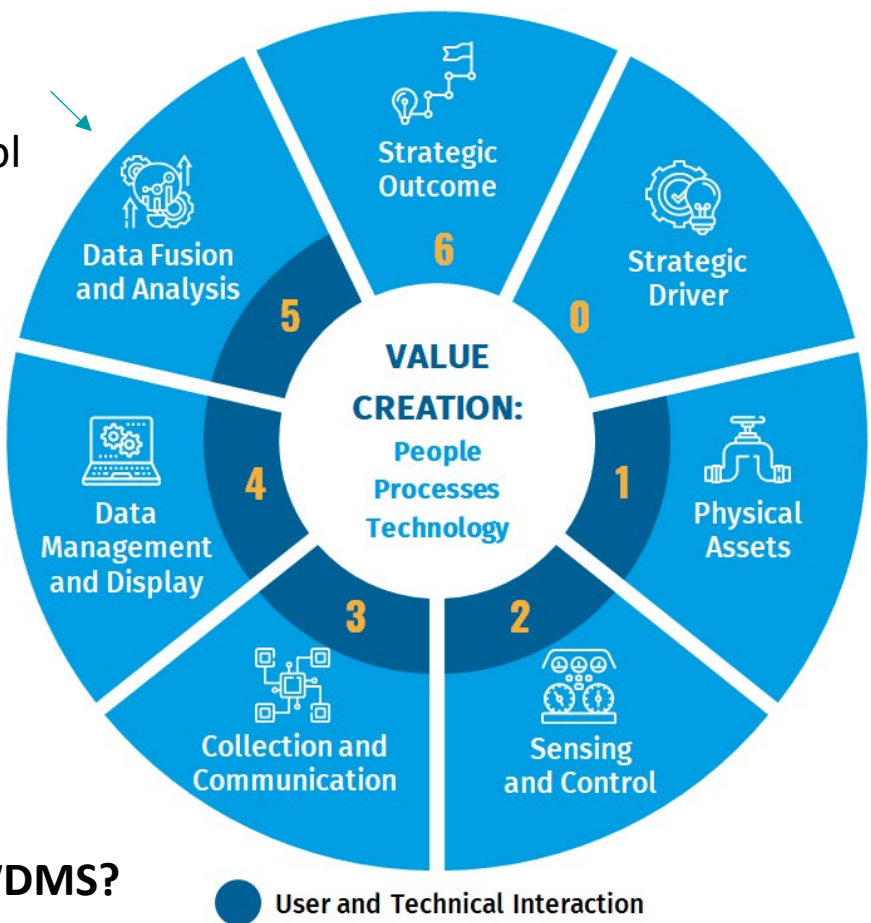




# Digital Twin Concept – For any Utility



In Data Fusion and Analysis, we encounter the difficulty of implementing a digital twin. In electrical energy, we call this tool ADMS (Advanced Distribution Management System).



In Smart Water, can we call it AWDMS?

# Smart Grid – Digital Twin in Energy Utility

ADMS in Gartner

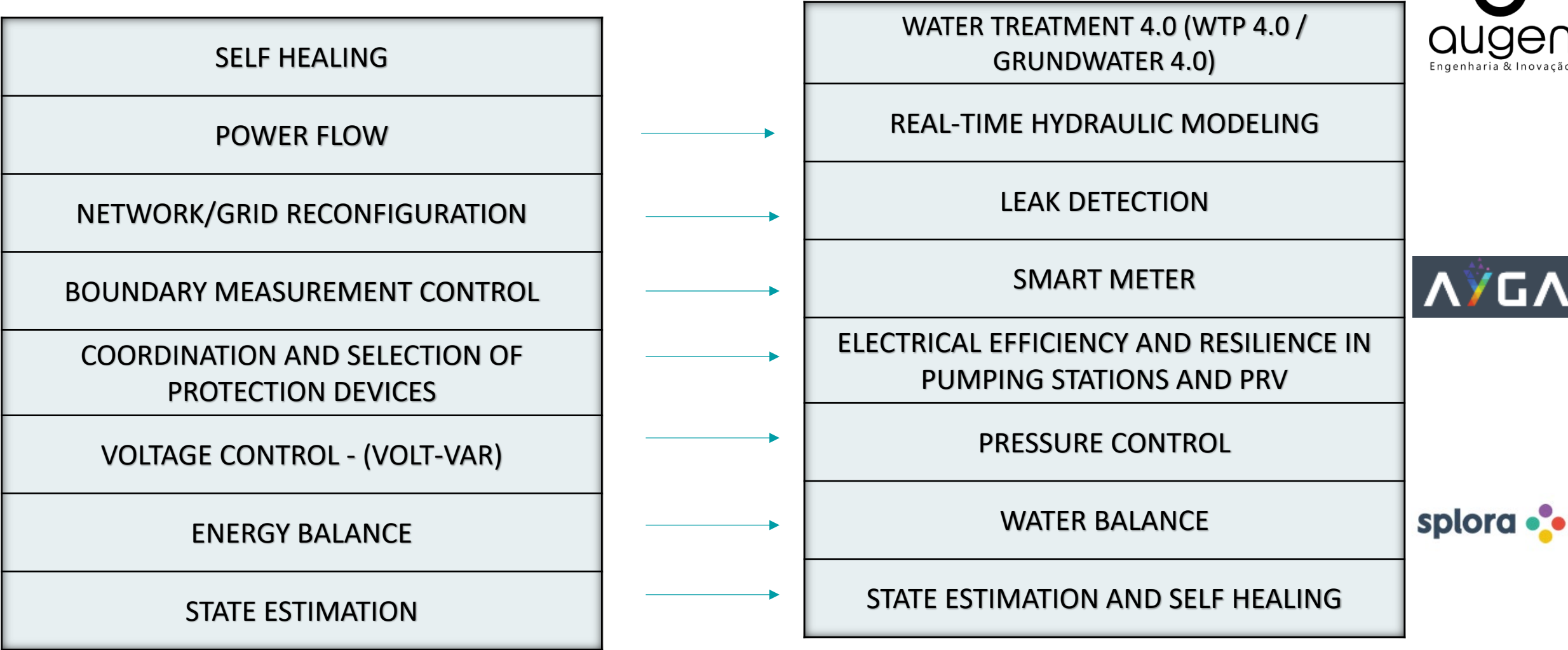


A  
D  
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S

ALGORITHMS OF A SMART GRID

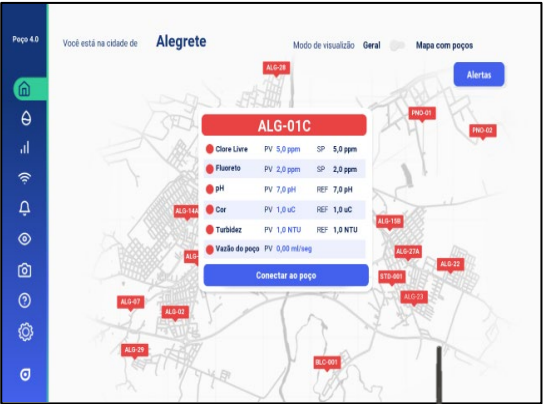
|  |
|--|
| SELF HEALING                                     |
| POWER FLOW                                       |
| NETWORK/GRID RECONFIGURATION                     |
| BOUNDARY MEASUREMENT CONTROL                     |
| COORDINATION AND SELECTION OF PROTECTION DEVICES |
| VOLTAGE CONTROL - (VOLT-VAR)                     |
| ENERGY BALANCE                                   |
| STATE ESTIMATION                                 |

# Smart Grid and Smart Water Nexus



ANALOGOUS ALGORITHMS

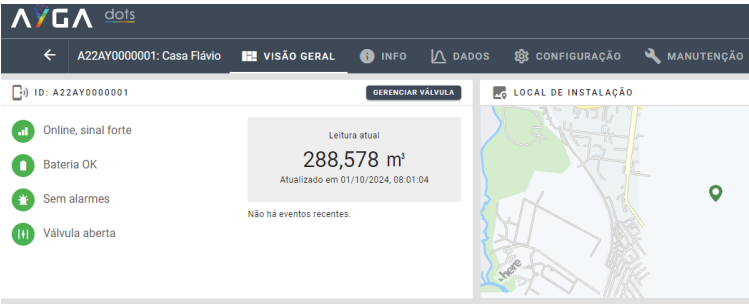
# Innovation and Digital Twin Projects (Augen, Ayga and Splora) - STARTUPS



<https://augenengenharia.com/>



Ultrasonic water meter with dry register and shut-off valve ball



<https://www.ayga.com.br/>



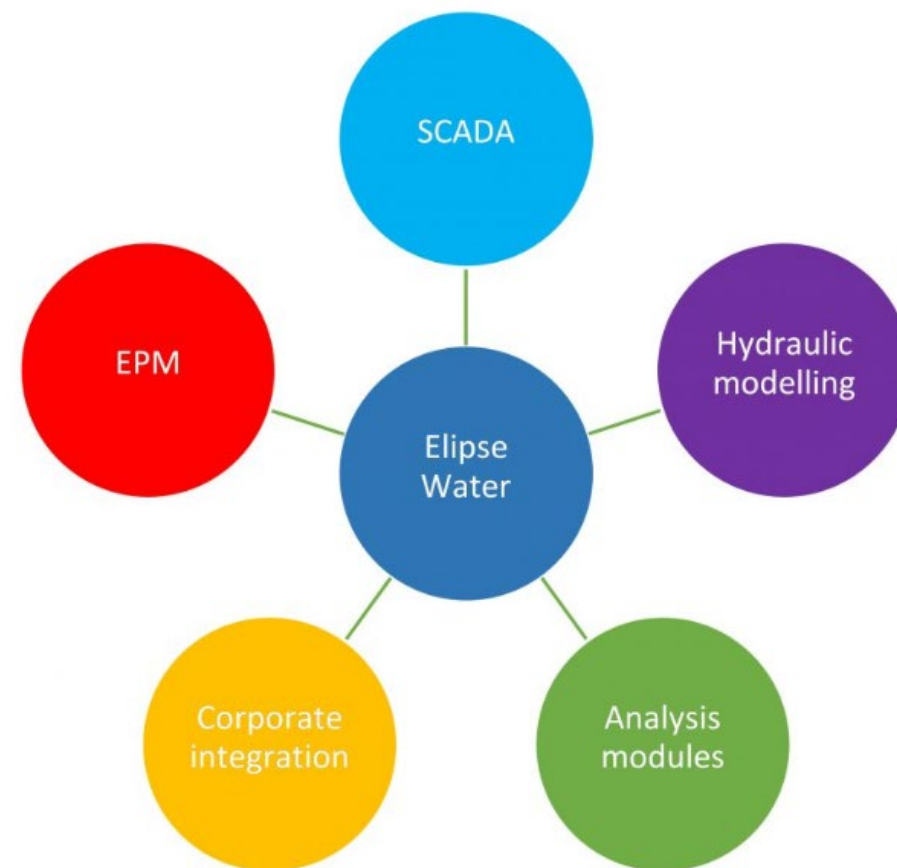
Água Conectada is an integrated solution with Internet of Things technology — "IoT" in SAAS – Software as a Service formatted for different modules in the intelligent management of the water cycle.

<https://splora.com.br/portfolios/agua-conectada/>

# Eclipse Water (Advanced Management System)



Eclipse Water is an evolution of Eclipse E3 SCADA system to better serve the management needs of sanitation systems. This is the perfect platform for optimizing and bringing more efficiency to the systems, the people, and the processes related to water and wastewater systems.

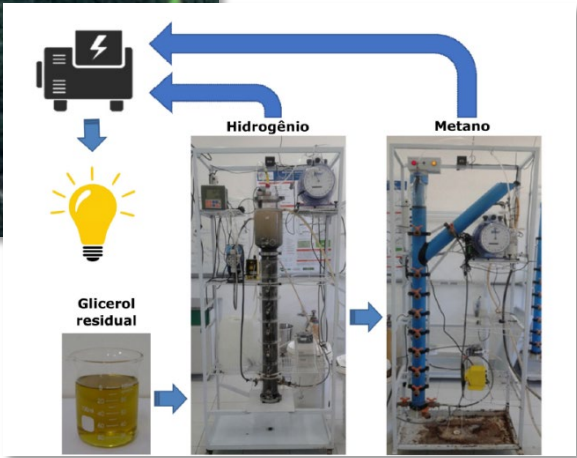
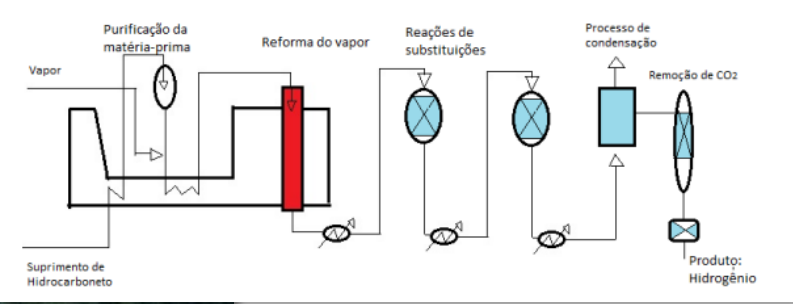
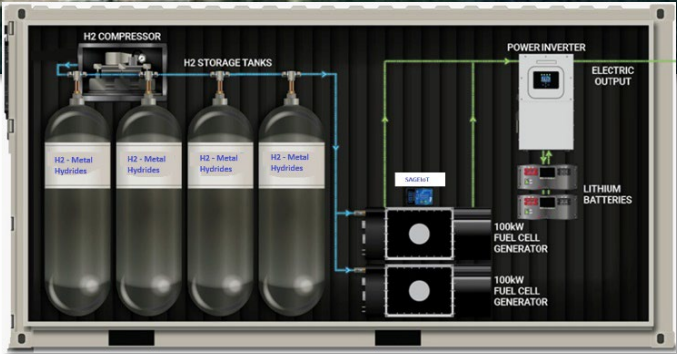


<https://www.elipse.com.br/en/produto/elipse-water/>



# Electrical Resilience, Green Hydrogen and Next Steps

- Centralized H2 Generation**
- (1) **Electrolysis**
  - (2) **Microbiological Process**
  - (3) **Steam Reforming**

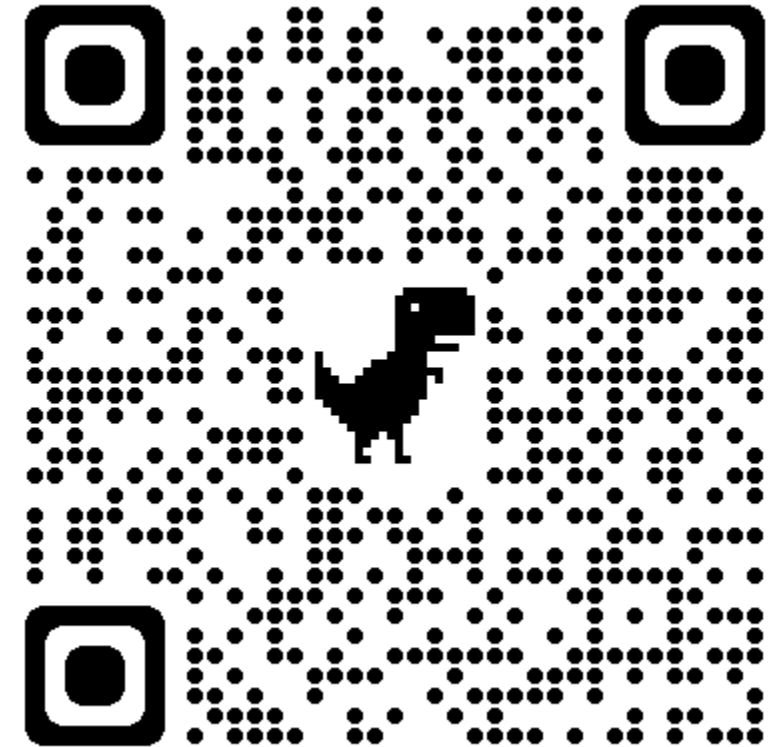


# THANK YOU

Comments or questions, please contact:

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For more information, visit <https://portal.pucrs.br/> and  
[www.waterrf.org](http://www.waterrf.org)



# Q&A

# THANK YOU

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For more information, visit [www.waterrf.org](http://www.waterrf.org)

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For more information, visit [www.swan-forum.com](http://www.swan-forum.com)