
AVEVAWORLD

SABESP: Enhancements in Water Resource Management with AVEVA PI System

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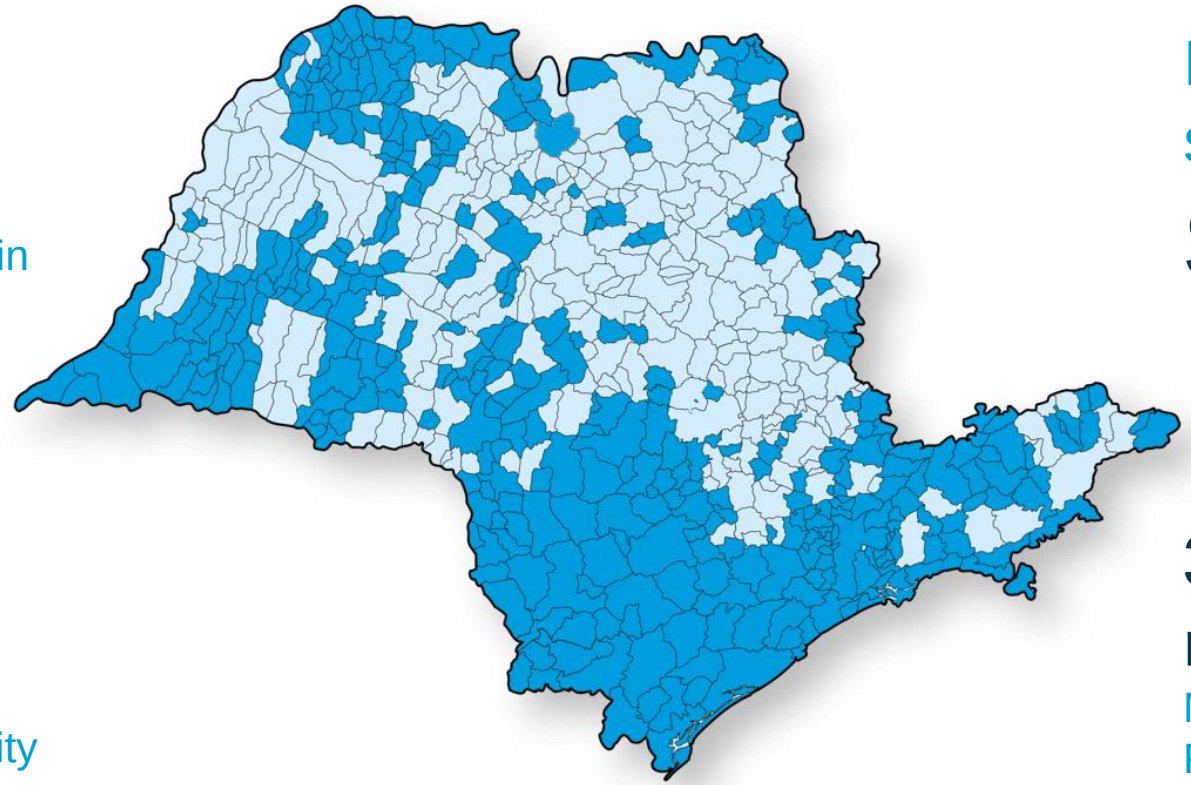
Basic Sanitation Company of the State of São Paulo

Sabesp

Where we are

Sabesp is the **second-largest sanitation company in the world** in terms of revenue.



Municipalities served by

Sabesp

28,1 million

customers directly supplied with high-quality water

376 municipalities

More than **63%** of São Paulo's urban population*

***In 2023, we won the bidding process for Olímpia**

Basic Sanitation Company of the State of São Paulo

Sabesp

Water Supply

Providing clean drinking water to households and businesses.

Sewerage

Collecting and treating wastewater to protect public health.

Watershed management

Monitor and protect watersheds through the collection and disposal of treated sewage.

Basic Sanitation Company of the State of São Paulo

Wagner Preda

stefanini GROUP

Enduring relationships & client satisfaction

92%

Willingness to **RECOMMEND**
Gartner® Voice of the Customer

65

NPS score

14 YEARS

Average client relationship

Comprehensive capabilities & strong track record

14+ years Applied AI & Gen AI leadership

250+ Applied AI Cases

49 **Average** client relationship

124 **Analyst** Recognitions 2024

Gartner · CELENT · ISG · Everest Group® · Quadrant

Key Alliances & Strategic Partnerships

Google · servicenow · Microsoft · salesforce · BlueYonder · aws · SAP

AVEVA System Integrator ENDORSED

Driving business impact

INCREASE sales
By **600%** Improved number of customers served[1]

REDUCE cost
By **62%** through decreasing equipment idleness[2]

IMPROVE quality
By **95%** enhancing user experiences and satisfaction[3]

ENHANCE speed
By **50%** faster application development time[4]

Global presence with a local touch

Serving **104** countries

35,000 employees

1.5B USD Revenue 2024

44 languages spoken

23 global delivery centers

Working together for good results

Successful Partnership

Sabesp’s Purpose

Sabesp's mission is to provide quality water and sewage services efficiently and sustainably, ensuring access to clean water and improving the quality of life for millions in São Paulo.

AVEVA PI System

The PI System standardizes data, enhances decision-making, and optimizes processes, supporting Sabesp’s commitment to efficiency, sustainability, and innovation.

Stefanini IHM

To be a strategic partner providing innovative solutions in search of a **more efficient and sustainable industry.**

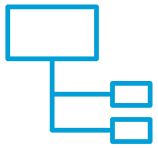
AVEVA™ PI System in Sabesp

PI System in Numbers

AVEVA™ PI System in Sabesp

Around **120,000 tags**

4,200 displays
(1085 customized + 12 templates)



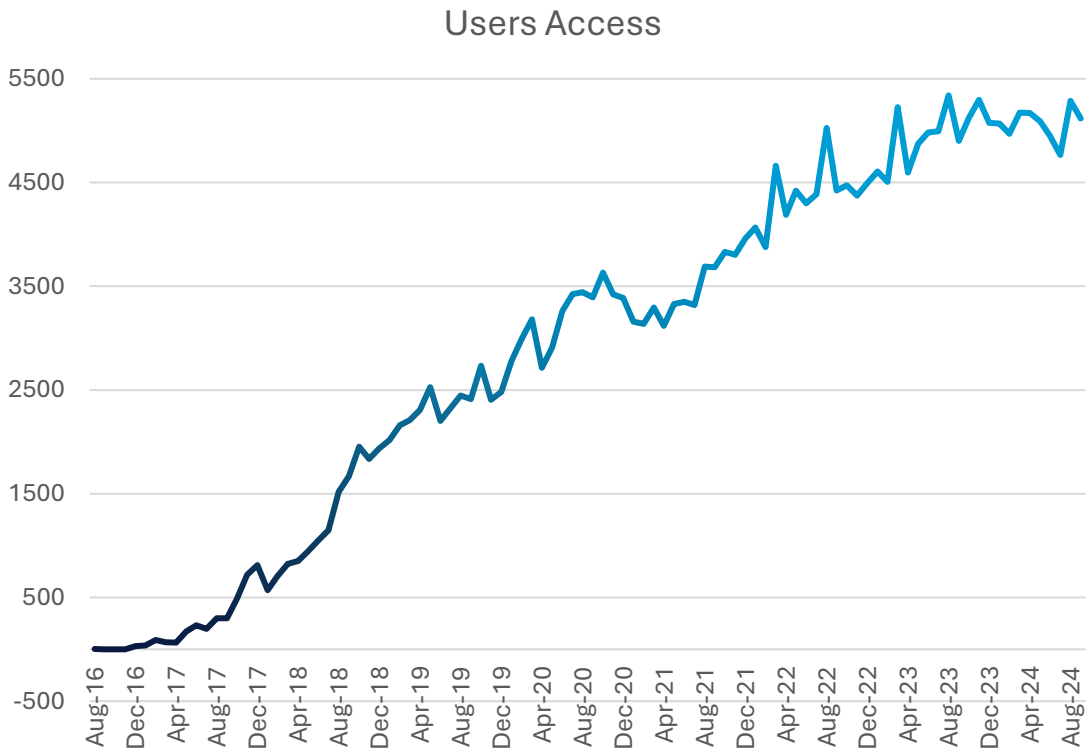
More than **27,000 assets**

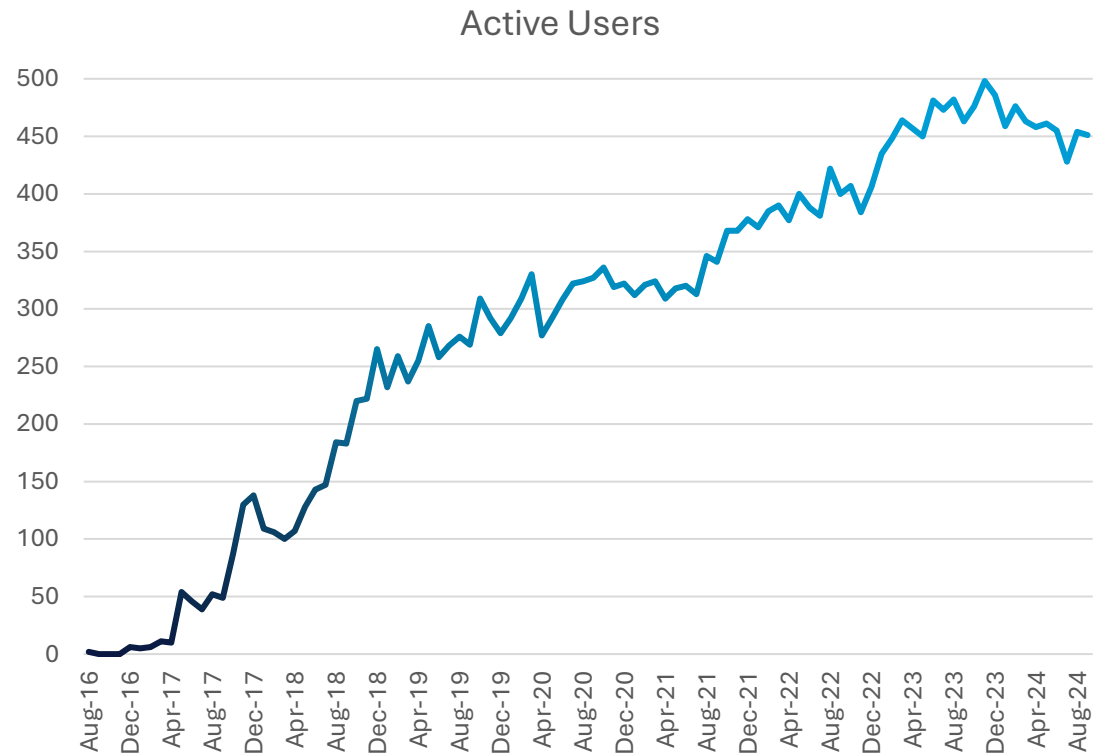
More than **250 trained**
50 in administration

440 users registered in the AD

60 Reports

Access to PI Vision





Business Challenge

Ensuring Continuous Water Supply

Ensuring Continuous Water Supply

Challenge

Cost Reduction, Performance & Scalability

- High Maintenance Costs
- Hardware Lifecycle Issues
- Scalability Limitations

Power Outages

- Interruptions at pump stations
- Delay in fault detection and decision-making
- Many screen to monitor
- High time for maintenance identification and action
- Temporary shortage in a region

Demand Prediction

- Unpredictable water consumption costumers.
- Difficulty planning and ensuring water supply in advance
- Seasonal and weather-related demand fluctuations
- Reactive operation





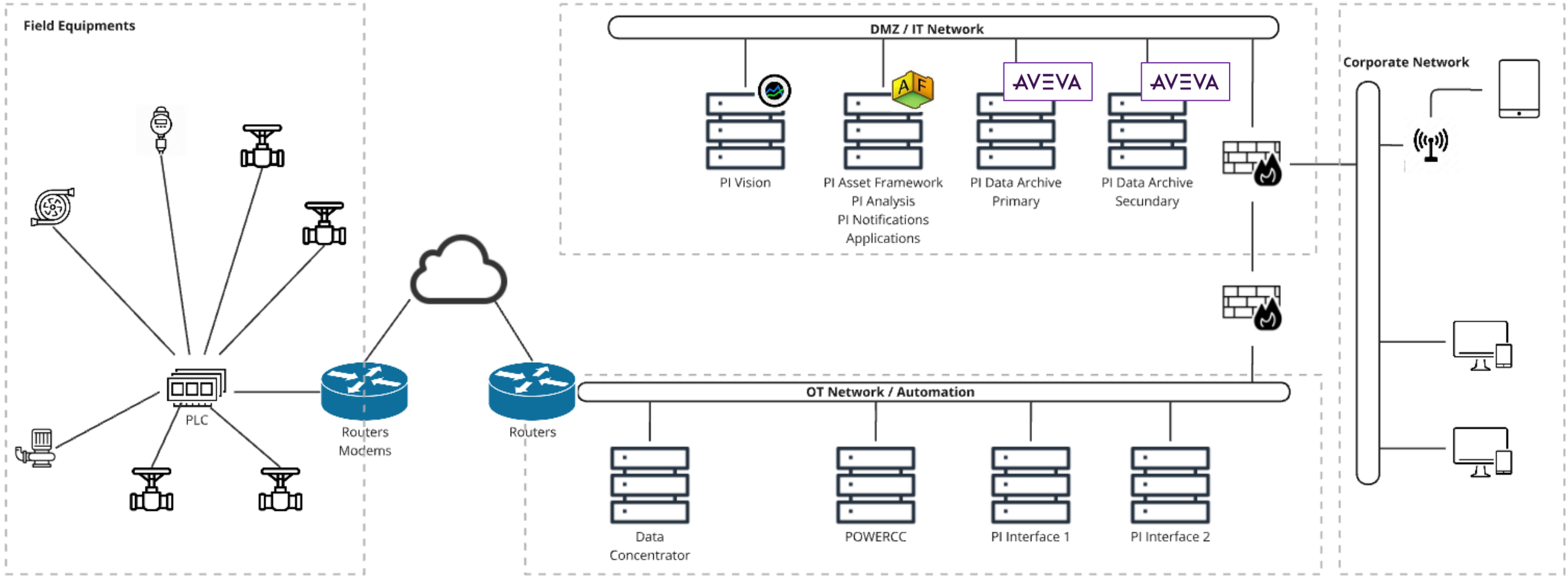


Solution

Virtualization
Real-Time Pumping Station Monitoring
Predictive Water Consumption Modeling

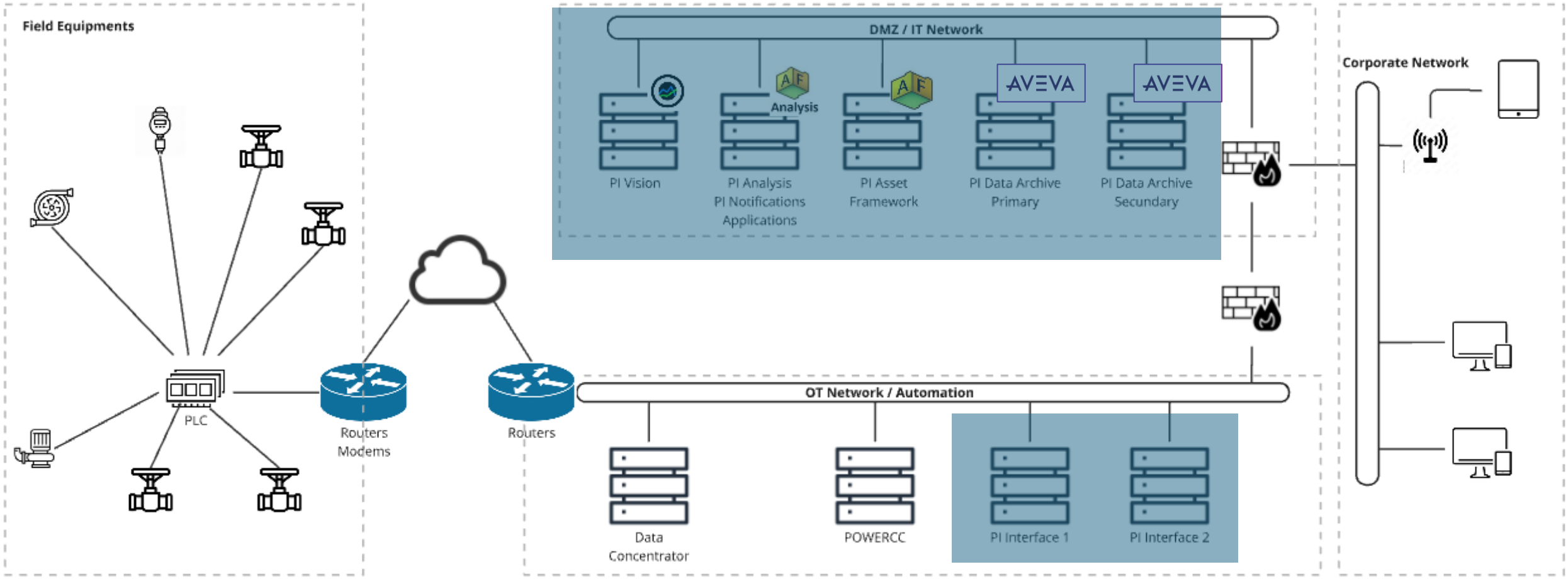
Before

Virtualization



After

Virtualization

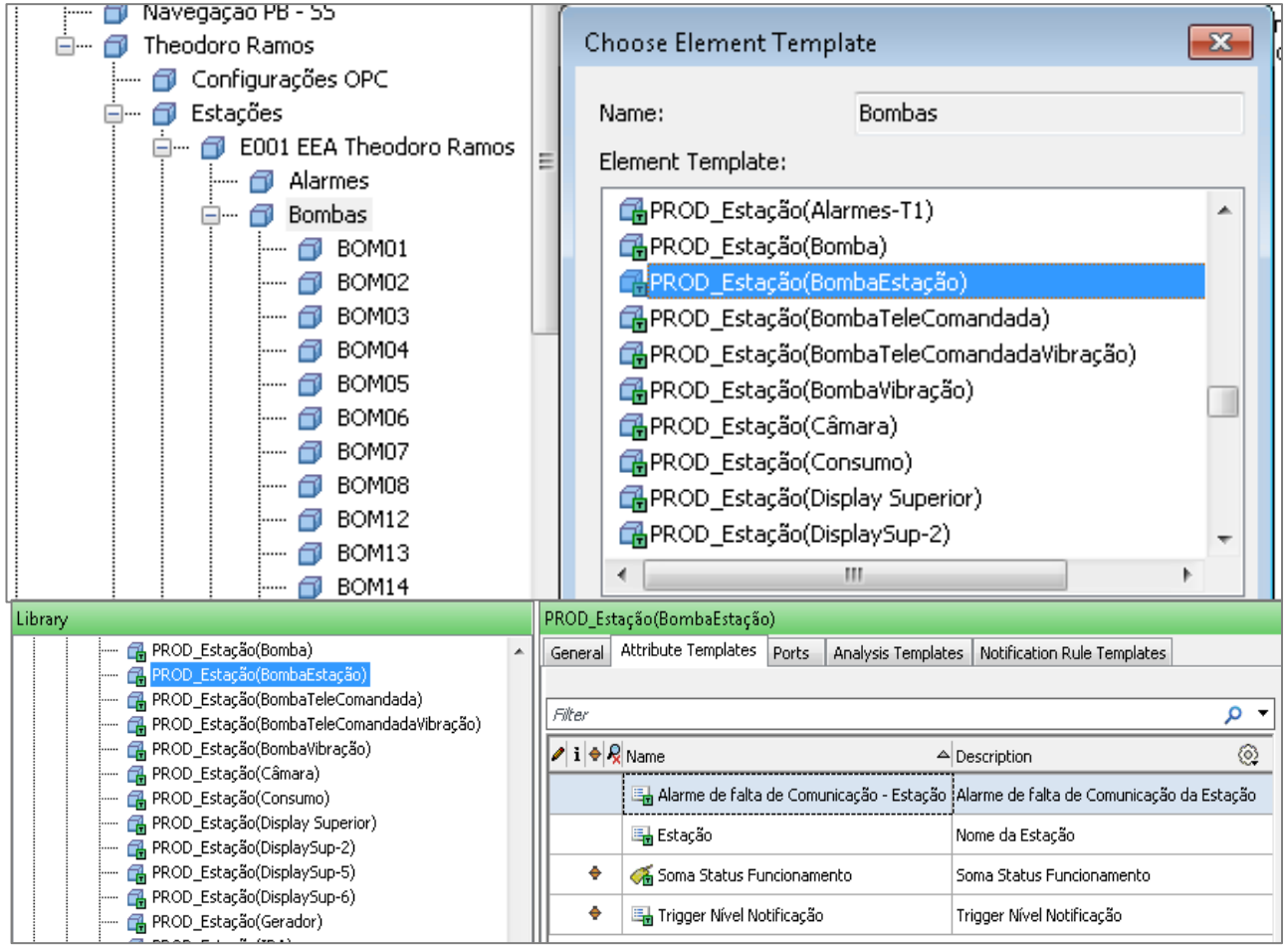


Faster response to power outages, reducing operational delays and public impact

Real-Time Pumping Station Monitoring

Automated Data Collection & Integration

- Over 3,000 pumps integrated into the PI System
- Real-time data acquisition, eliminating manual data entry
- Centralized monitoring of pump status and performance

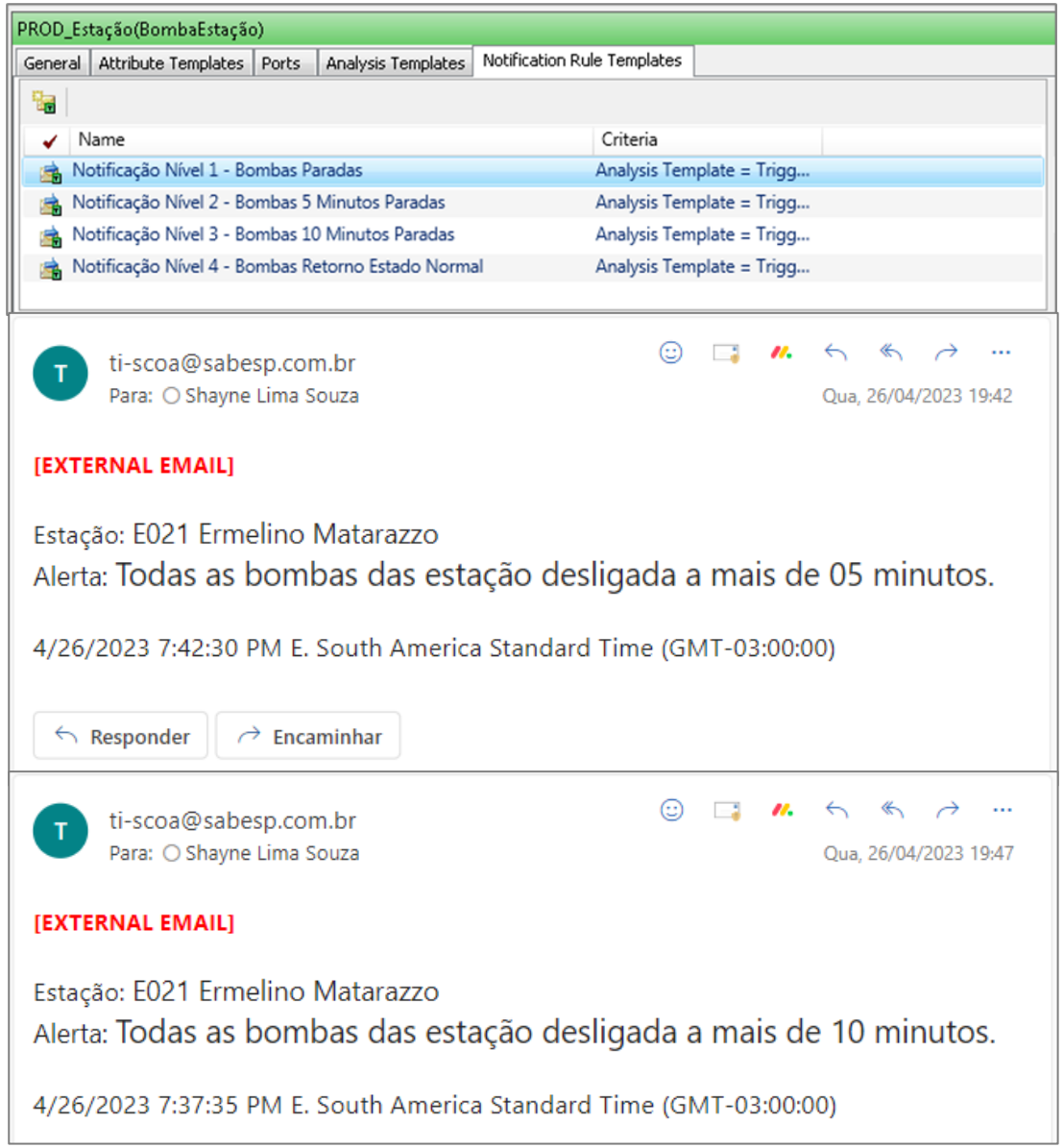


Faster response to power outages, reducing operational delays and public impact

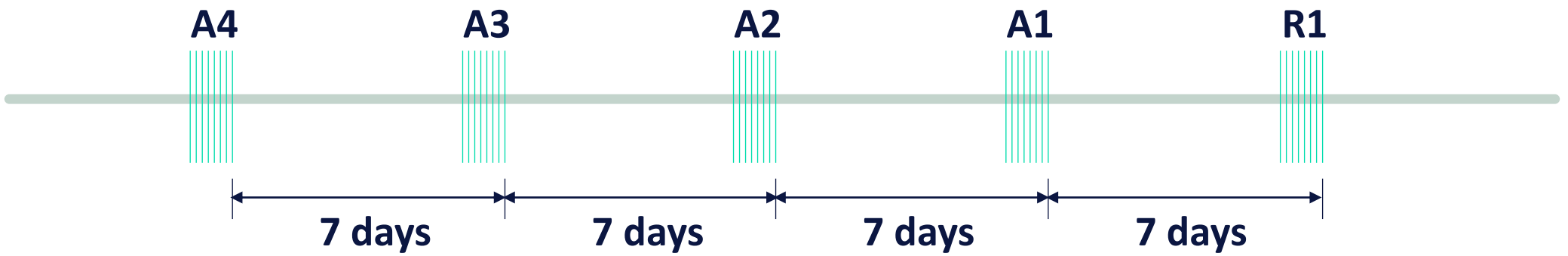
Real-Time Pumping Station Monitoring

Intelligent Alarm & Notification System

- Automated failure detection when a pump stops unexpectedly
- Escalation mechanism ensures rapid response:
  - 1st level: Initial group notified immediately
  - 2nd level: If no action within 5 minutes, alert escalates
  - 3rd level: After 10 minutes, notification reaches higher-level users



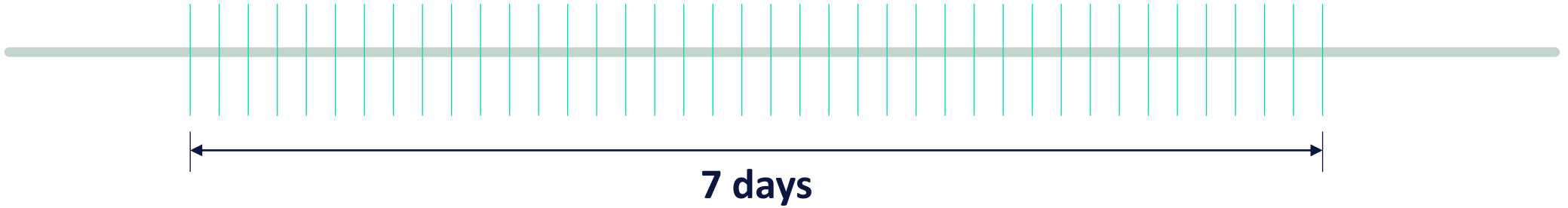
Predictive Consumption Modeling



- Implementation of Zahed Filho's model (1990) for water consumption prediction
- Uses historical consumption data from the last 4 weeks
- Calculates a correction factor (Alfa) based on recent consumption trends
- Adjusts forecasts dynamically using real-time and historical data

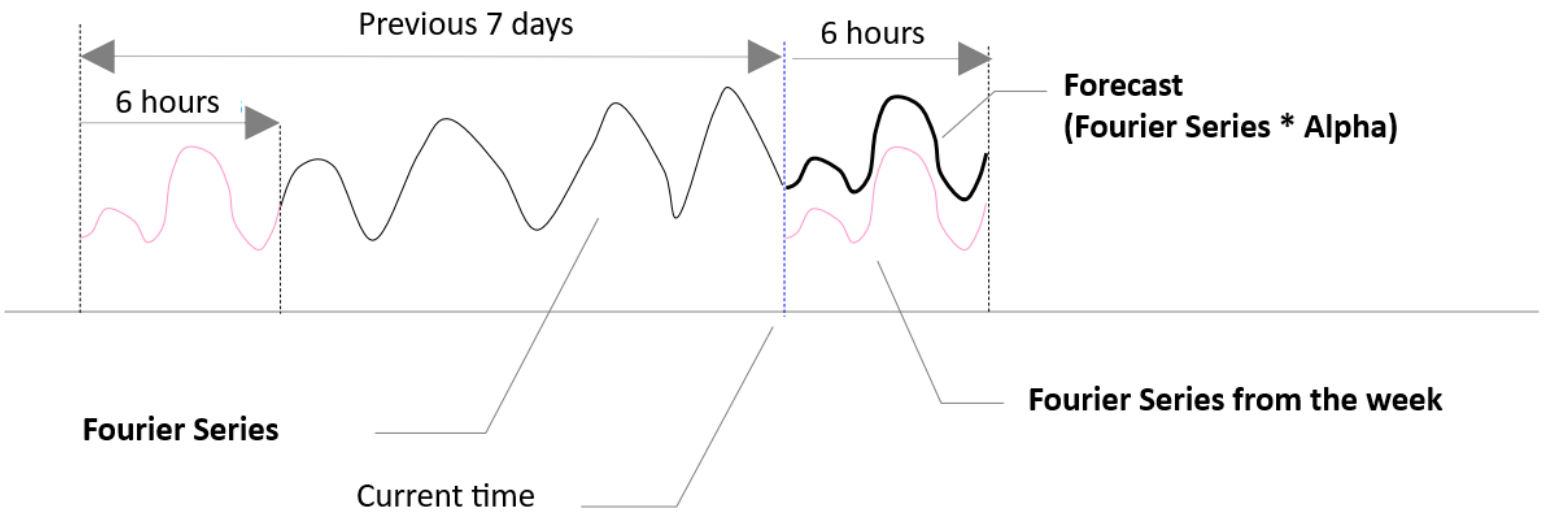
* ZAHED FILHO, A., Previsão de Consumo em Tempo Real no Desenvolvimento Operacional de Sistemas de Distribuição de Água, Tese de Doutorado, Escola Politécnica da Universidade de São Paulo, EPUSP, São Paulo, 1990.

Predictive Consumption Modeling



- Filters data using a Fourier transform to remove irregularities
- Uses historical consumption data from the last 7 days

Predictive Consumption Modeling

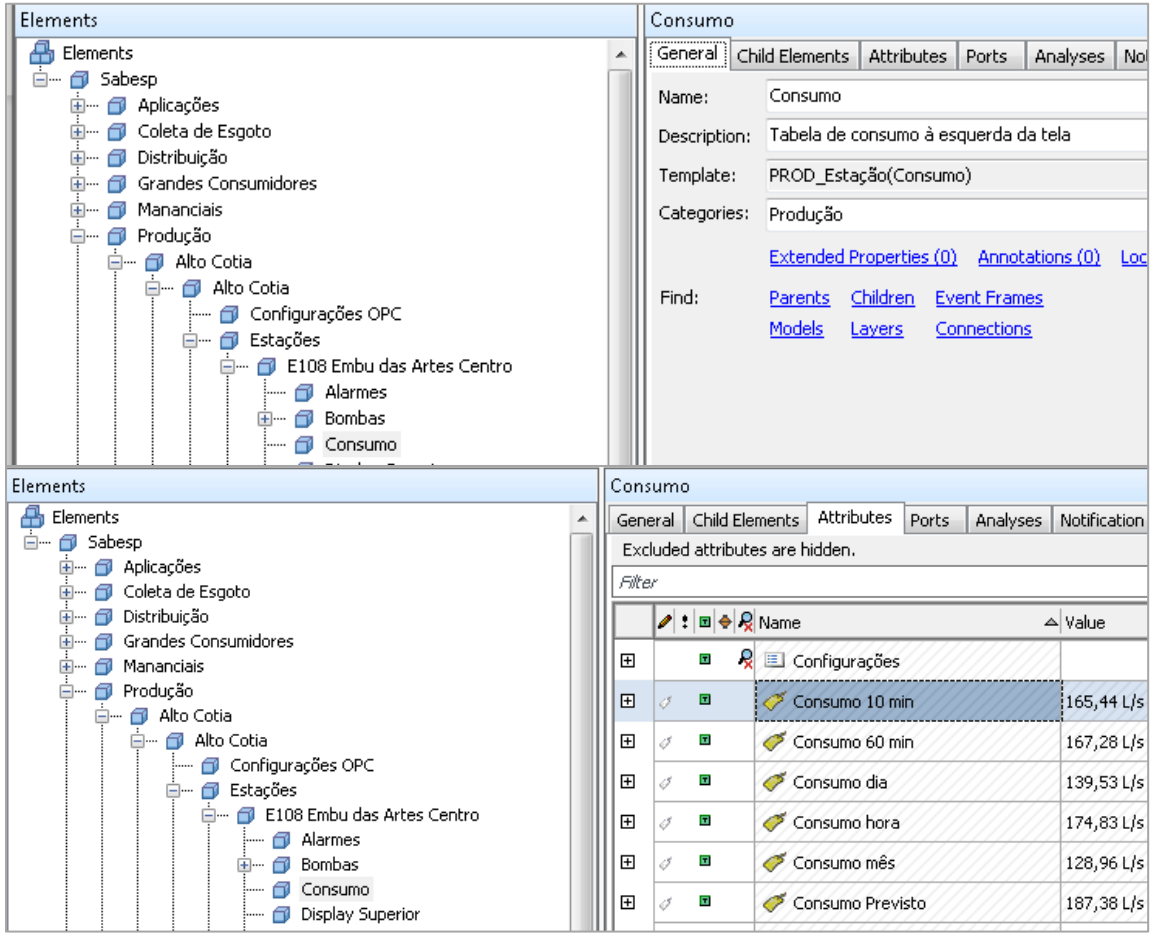


- Adjusts forecasts dynamically using real-time and historical data

Real-Time Demand Forecasting

Predictive Consumption Modeling

- Structured Hierarchy for Pumping Stations
- Forecasting parameters are stored as AF attributes, allowing for easy configuration and adjustment.
- Changes in operational parameters (e.g., coefficients, thresholds) can be updated dynamically without modifying the core system.



Results

Enhanced Operational Efficiency

Results

1% in water shortages

- Benefiting 201,500 people in the São Paulo
- Decrease in customer complaints

Cost Reduction with Virtualization

- Eliminated hardware replacement cycles
- Easy scaling of infrastructure to support future growth

More Accurate Water Consumption Forecasts

- Improved demand prediction

WATER | BRAZIL

SABESP: Enhancements in Water Resource Management with AVEVA™ PI System

Challenge

- Servers running on physical machines with an outdated 2016 PI System.
- Delayed power outage detection in pump stations, causing slow response times.
- Unpredictable water consumption costumers.

Solution

- Virtualized servers and upgraded the AVEVA™ PI System for better resource management and reliability.
- Implemented automated monitoring and alerts for water pump stations.
- Development of a mathematical model based on Fourier Series, using PI AF SDK, for water consumption forecast.

Results

- **Improved system robustness, faster recovery, and no hardware dependency.**
- **Increased efficiency and accuracy in tag updates per business unit.**
- **Faster response to power outages, reducing operational delays and public impact.**
- **Enhanced consumption forecasting, ensuring reliable water supply management.**
- **1% reduction in water shortages, benefiting 201,500 people in the São Paulo metropolitan area.**

Thank you!

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CO-CREATING SOLUTIONS
FOR A BETTER FUTURE

sabesp