

The background is a dark purple gradient. On the left, there are two vertical neon lines, one blue and one magenta, with a horizontal magenta line intersecting the blue one. On the right, a large magenta arc curves from the top towards the bottom. The text 'AVEVA WORLD' is centered in a white, bold, sans-serif font.

AVEVA WORLD

SABESP: Enhancements in Water Resource Management with AVEVA PI System

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Basic Sanitation Company of the State of São Paulo

Sabesp

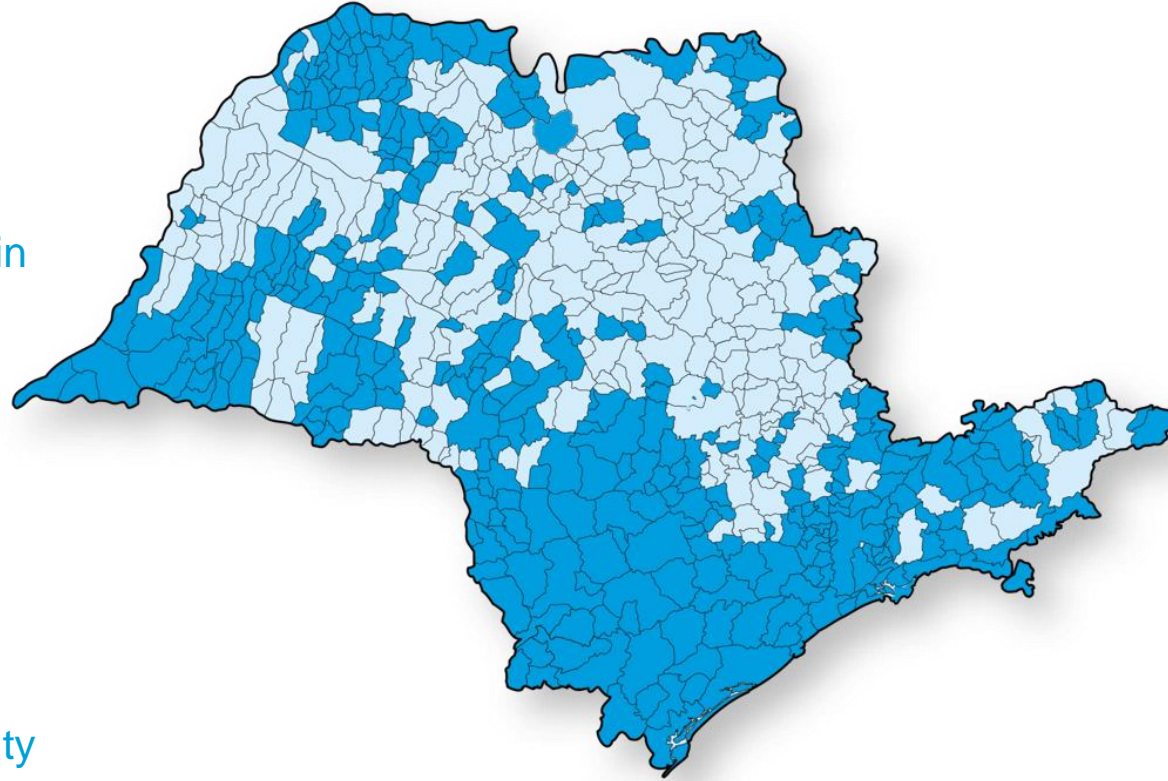




Where we are

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

28,1 million
customers directly
supplied with high-quality
water



Municipalities
served by
Sabesp

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.





Wagner Preda



Hello, my name is Wagner Preda and it is a pleasure to be here with all of you.

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
Partner Ecosystem

System
Integrator

EDRIS

Driving business impact



INCREASE
sales

By **600%**
Improved number of
customers served¹



REDUCE
cost

By **62%** through
decreasing equipment
idleness²



IMPROVE
quality

By **95%** enhancing
user experiences and
satisfaction³



ENHANCE
speed

By **50%** faster
application
development time⁴

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



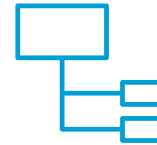
AVEVA™ PI System in Sabesp



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

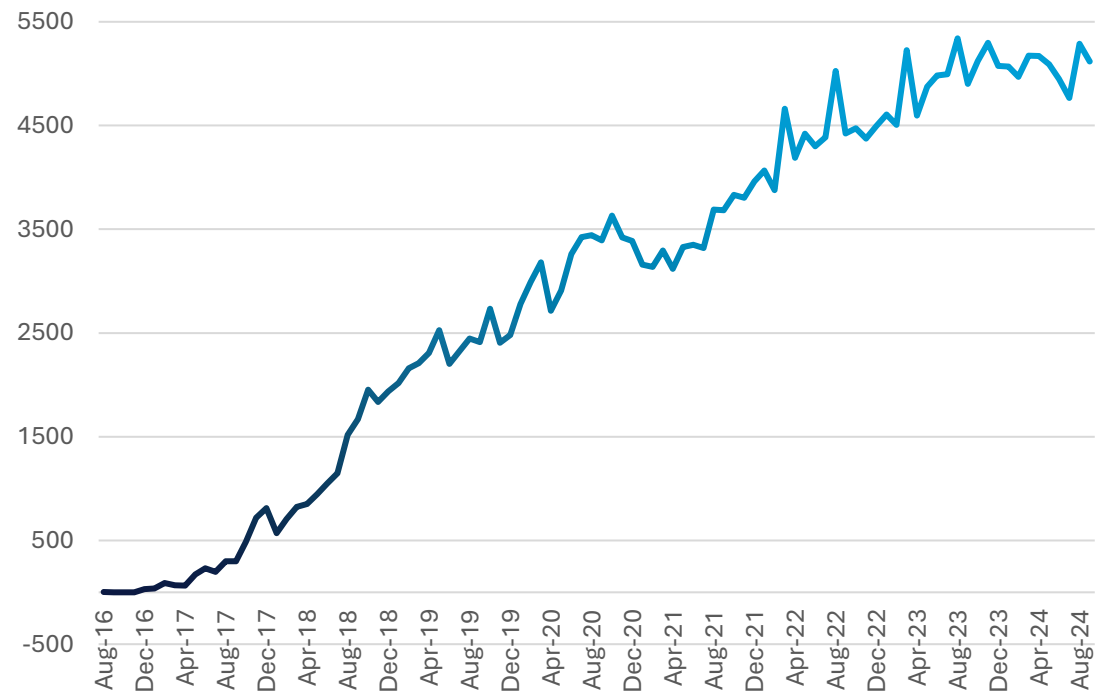


60 Reports

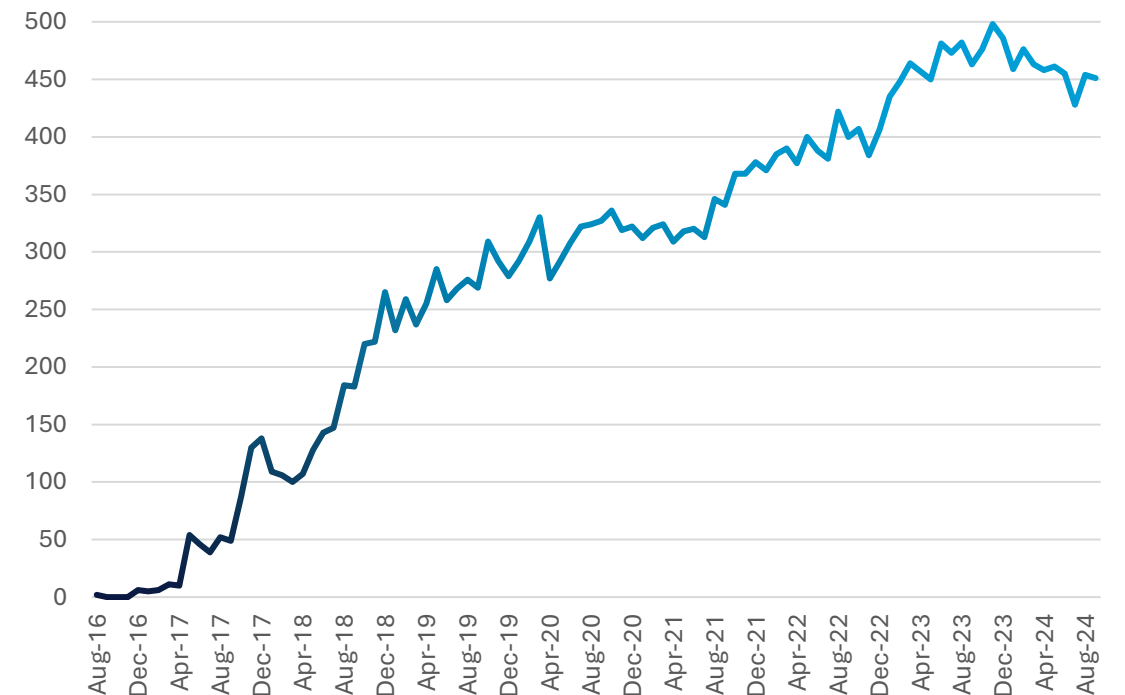


Access to PI Vision

Users Access



Active Users



Business Challenge

Ensuring Continuous Water Supply

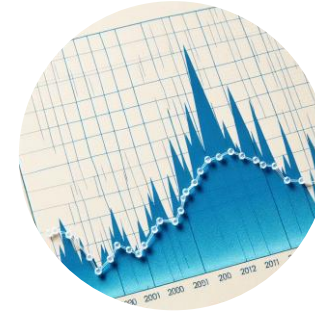


Ensuring Continuous Water Supply

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

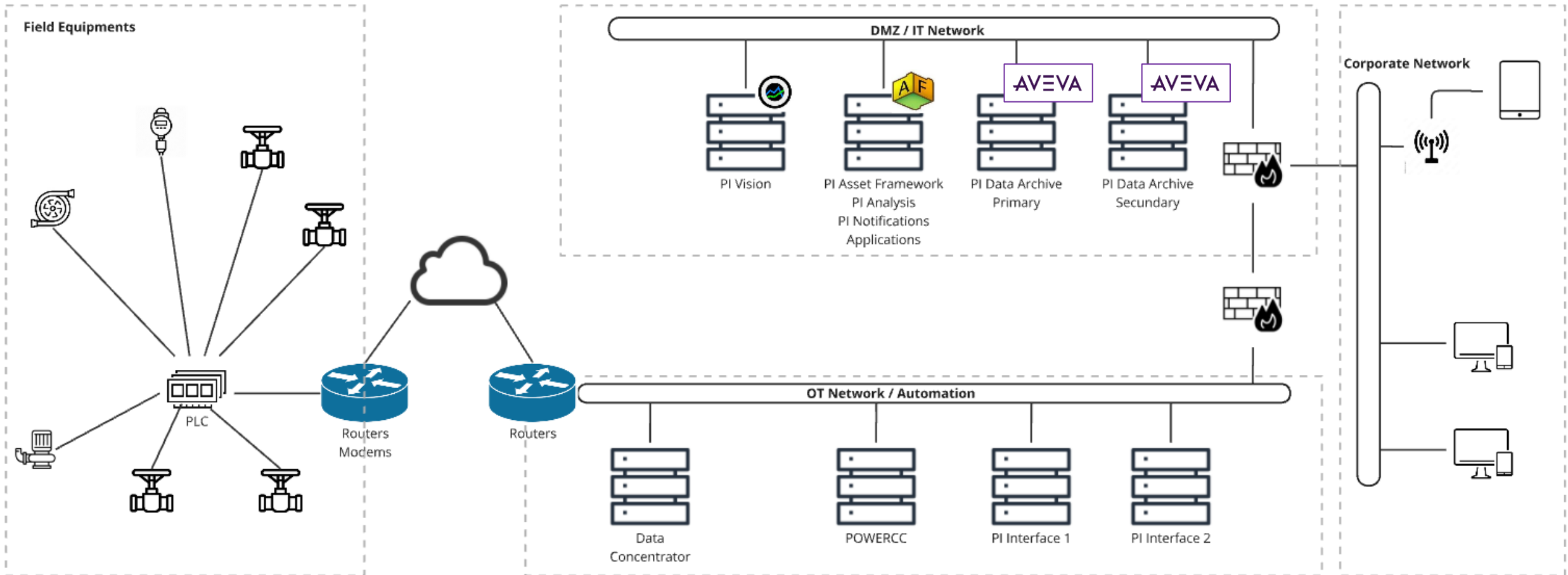
Virtualization

Real-Time Pumping Station Monitoring

Predictive Water Consumption Modeling

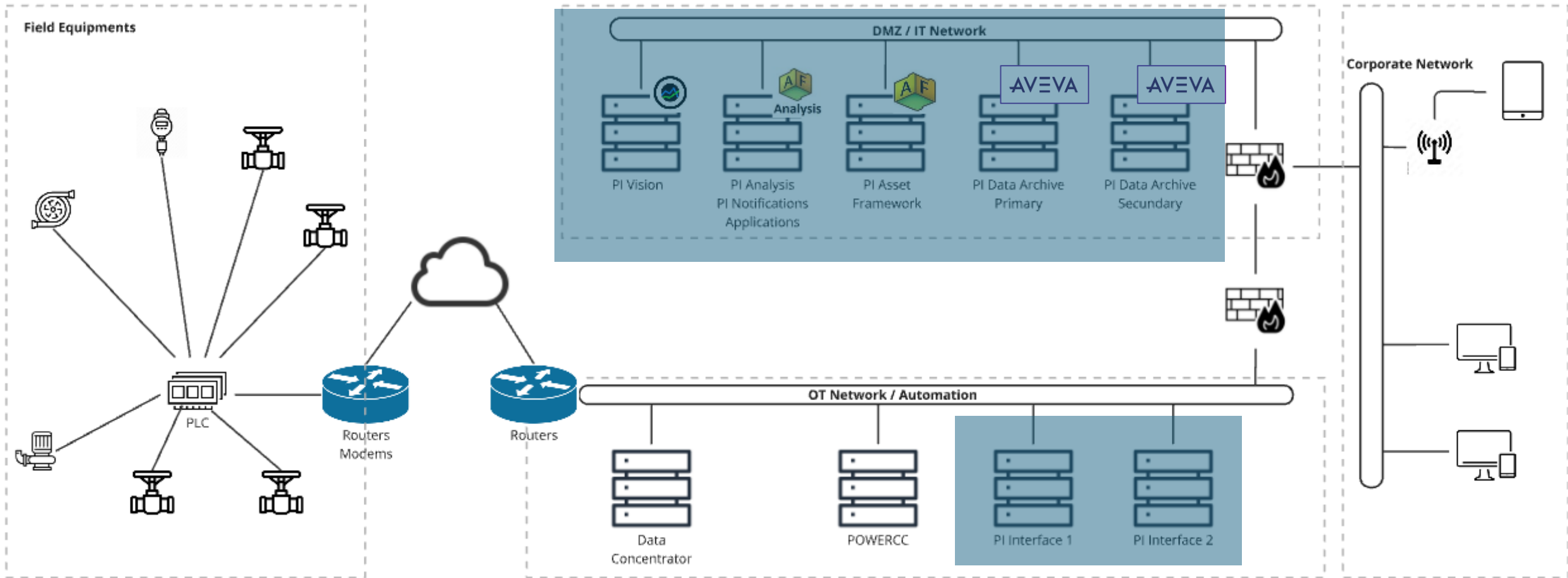
Before

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

The screenshot displays a software interface for pump station monitoring. The top left pane shows a hierarchical tree view of the system structure, including 'Navegação PB - SS', 'Theodoro Ramos', 'Configurações OPC', 'Estações', 'E001 EEA Theodoro Ramos', 'Alarmes', and 'Bombas'. The 'Bombas' folder is expanded, showing a list of pumps from BOM01 to BOM14. The top right pane is a 'Choose Element Template' dialog box. The 'Name' field is set to 'Bombas'. The 'Element Template' list includes several options, with 'PROD_Estação(BombaEstação)' selected. The bottom left pane shows a 'Library' pane with a list of templates, including 'PROD_Estação(Bomba)', 'PROD_Estação(BombaEstação)', 'PROD_Estação(BombaTeleComandada)', 'PROD_Estação(BombaTeleComandadaVibração)', 'PROD_Estação(BombaVibração)', 'PROD_Estação(Câmara)', 'PROD_Estação(Consumo)', 'PROD_Estação(Display Superior)', 'PROD_Estação(DisplaySup-2)', 'PROD_Estação(DisplaySup-5)', 'PROD_Estação(DisplaySup-6)', and 'PROD_Estação(Gerador)'. The bottom right pane shows a detailed view of the 'PROD_Estação(BombaEstação)' template. It includes tabs for 'General', 'Attribute Templates', 'Ports', 'Analysis Templates', and 'Notification Rule Templates'. The 'General' tab is active, showing a table of attributes with columns for 'Name' and 'Description'.

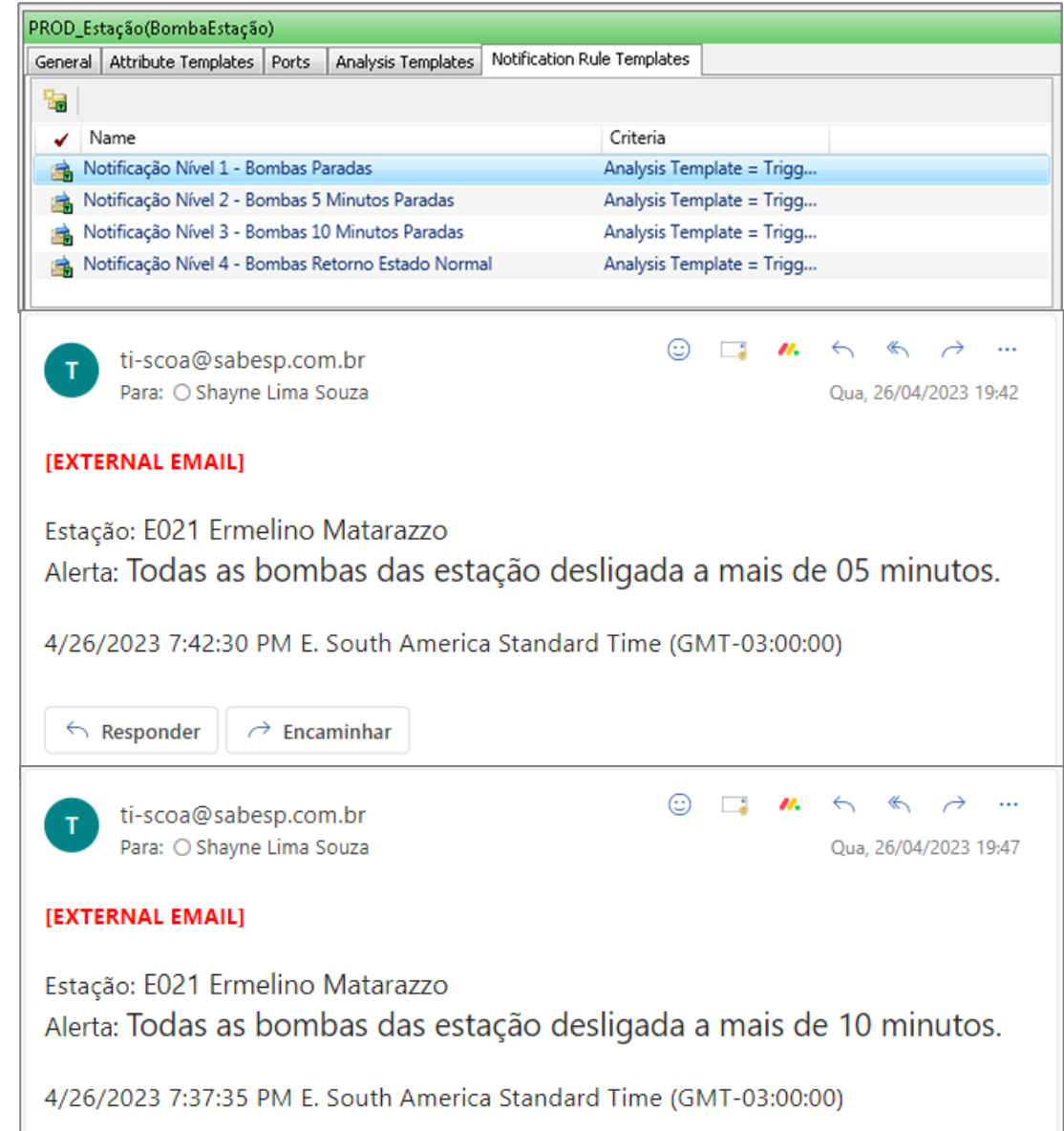
Name	Description
Alarme de falta de Comunicação - Estação	Alarme de falta de Comunicação da Estação
Estação	Nome da Estação
Soma Status Funcionamento	Soma Status Funcionamento
Trigger Nível Notificação	Trigger Nível Notificação

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



The screenshot displays a software interface for managing notification templates and viewing sent emails. The top section, titled 'PROD_Estação(BombaEstação)', contains tabs for 'General', 'Attribute Templates', 'Ports', 'Analysis Templates', and 'Notification Rule Templates'. Below these is a table of notification rules:

Name	Criteria
Notificação Nível 1 - Bombas Paradas	Analysis Template = Trigg...
Notificação Nível 2 - Bombas 5 Minutos Paradas	Analysis Template = Trigg...
Notificação Nível 3 - Bombas 10 Minutos Paradas	Analysis Template = Trigg...
Notificação Nível 4 - Bombas Retorno Estado Normal	Analysis Template = Trigg...

Below the table, two email notifications are shown, both from 'ti-scoa@sabesp.com.br' to 'Shayne Lima Souza' on 'Qua, 26/04/2023'.

First Email (19:42):

[EXTERNAL EMAIL]

Estação: E021 Ermelino Matarazzo
Alerta: Todas as bombas das estação desligada a mais de 05 minutos.

4/26/2023 7:42:30 PM E. South America Standard Time (GMT-03:00:00)

Buttons: Responder, Encaminhar

Second Email (19:47):

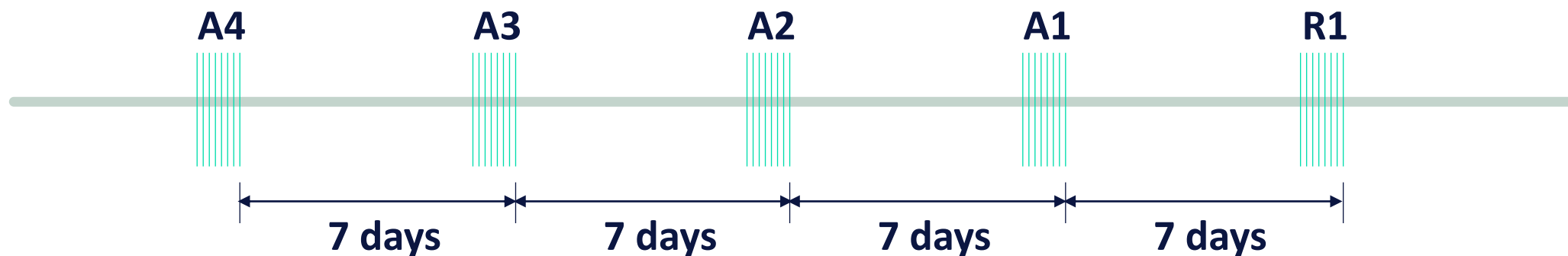
[EXTERNAL EMAIL]

Estação: E021 Ermelino Matarazzo
Alerta: Todas as bombas das estação desligada a mais de 10 minutos.

4/26/2023 7:37:35 PM E. South America Standard Time (GMT-03:00:00)



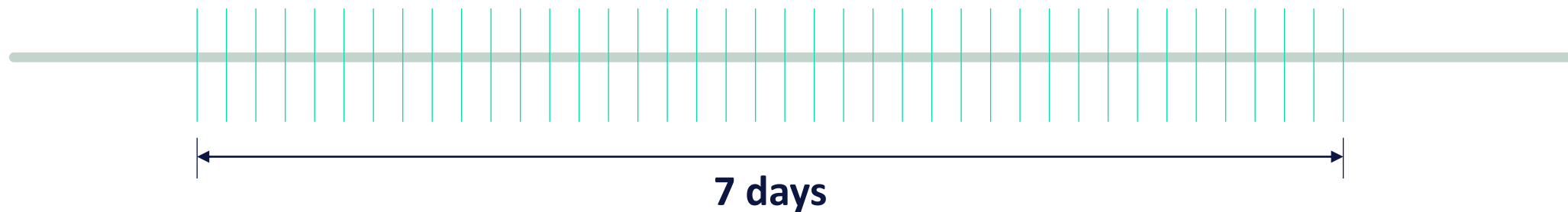
Predictive Consumption Modeling



- 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



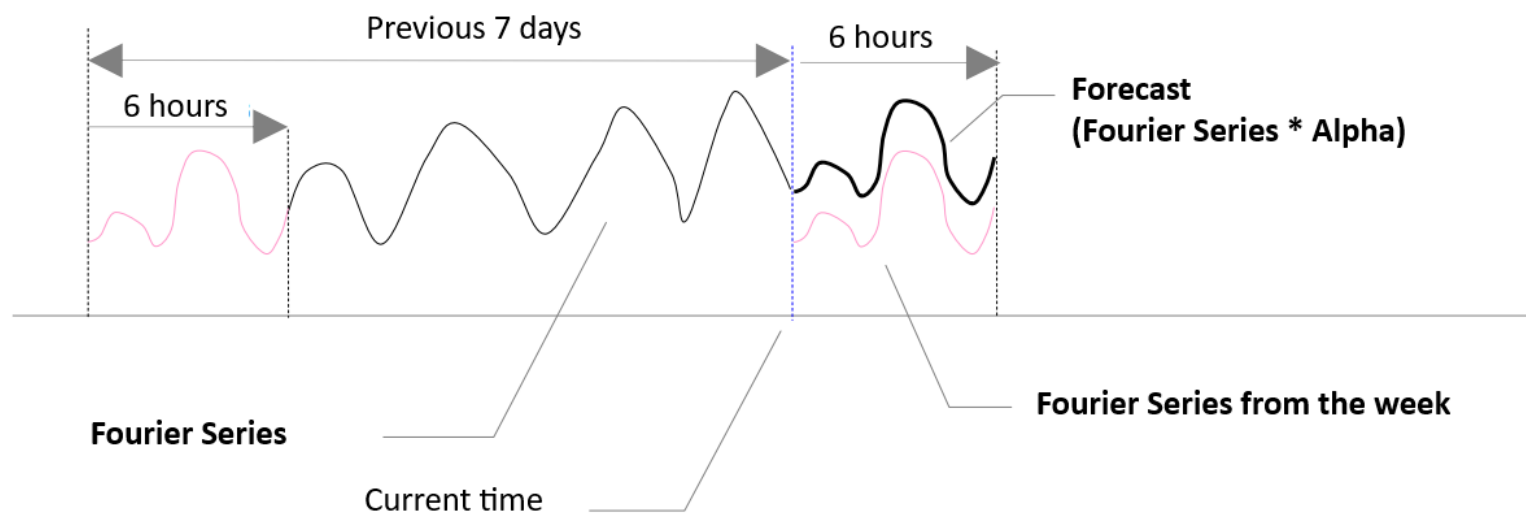
Predictive Consumption Modeling



- 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



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.

The screenshot displays a software interface for managing pumping station data. It is divided into two main sections: a hierarchical tree on the left and a detailed view on the right.

Elements Tree (Left):

- Elements
 - Sabesp
 - Aplicações
 - Coleta de Esgoto
 - Distribuição
 - Grandes Consumidores
 - Mananciais
 - Produção
 - Alto Cotia
 - Alto Cotia
 - Configurações OPC
 - Estações
 - E108 Embu das Artes Centro
 - Alarmes
 - Bombas
 - Consumo

Consumo Detail View (Right):

The 'Consumo' element is selected, showing its properties in the 'General' tab.

- Name: Consumo
- Description: Tabela de consumo à esquerda da tela
- Template: PROD_Estação(Consumo)
- Categories: Produção
- Find: [Parents](#) [Children](#) [Event Frames](#) [Models](#) [Layers](#) [Connections](#)

Below the detail view, a table lists consumption values for various time intervals. The table has columns for 'Name' and 'Value'.

Name	Value
Configurações	
Consumo 10 min	165,44 L/s
Consumo 60 min	167,28 L/s
Consumo dia	139,53 L/s
Consumo hora	174,83 L/s
Consumo mês	128,96 L/s
Consumo Previsto	187,38 L/s

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



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!



CO-CREATING SOLUTIONS
FOR A BETTER FUTURE

