Asset and Operations Real Time Analytics (AORTA) Project

Presented by **Thames Water and Wipro**

OSIsoft.

REGIONAL SEMINAR 2012

EMEA

The Power of Data

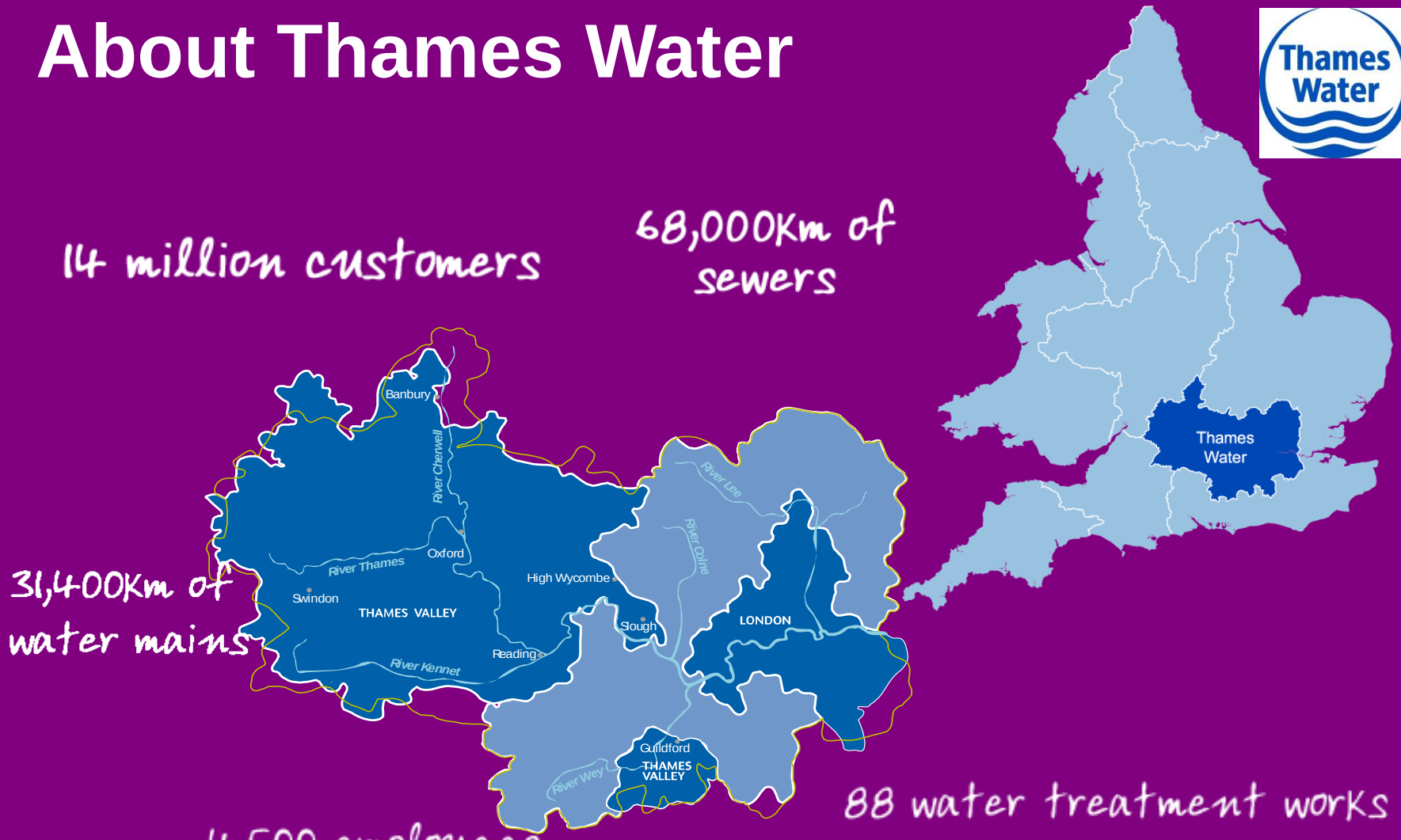
Agenda

- About Thames Water
- Business challenge
- Legacy system landscape
- AORTA solution
- PI Tools used
- Screen shots
- How PI helped
- Future plans for PI
- Questions

About Thames Water

14 million customers

68,000Km of sewers



31,400Km of water mains

4,500 employees

15,000 contractors

88 water treatment works &

350 sewage treatment works

UK's largest water and sewerage company

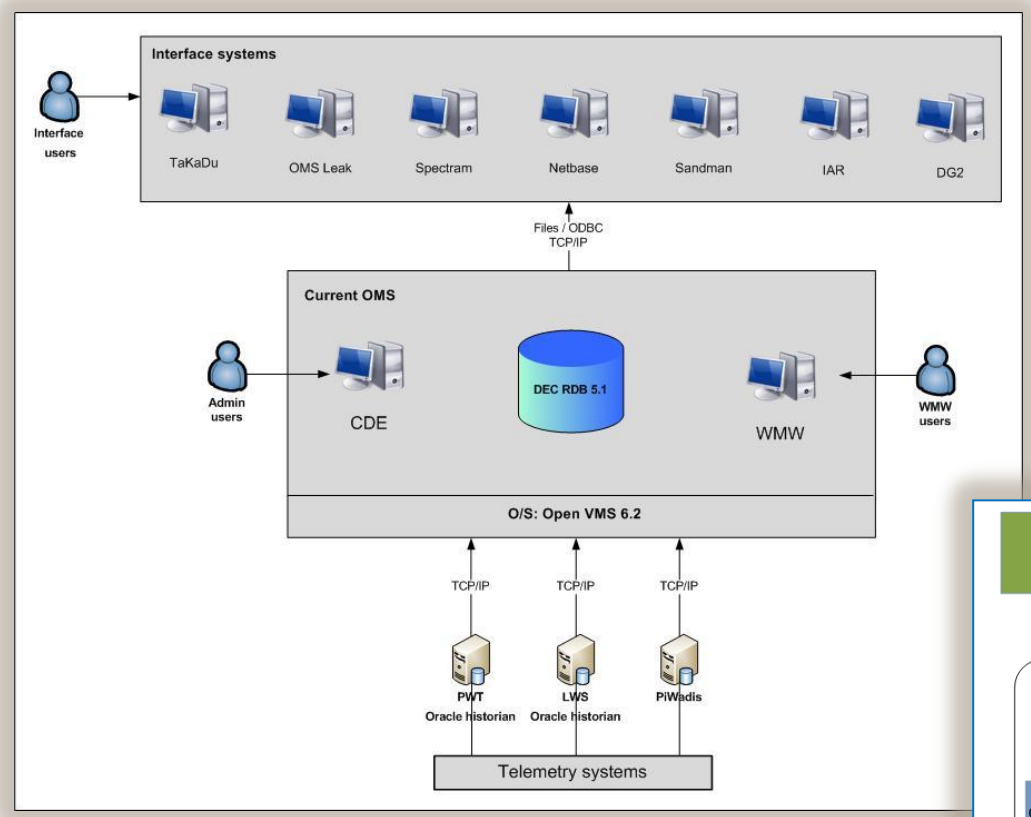
About Thames Water – contd…

- We serve one quarter of all customers in England
- The country's capital city is at the heart of our supply area
- £5 billion capital programme (largest in country)
- Biggest scarcity of water, with the highest population density
- Major, innovative and challenging engineering projects

Business challenge

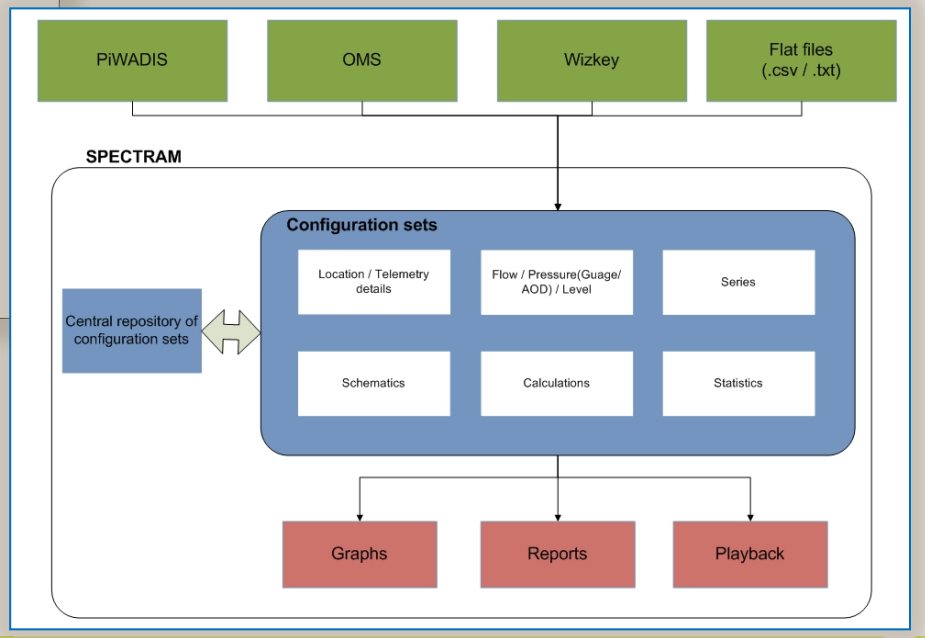
- Operational Management System (OMS) was a 20 year old legacy application used in Thames Water to hold flow, pressure, turbidity and reservoir levels information collected from Thames Water's clean water network
- Interface application systems collected data from OMS to produce business-critical regulatory reports
- OMS was at the peak of the operating limits and was unsupported by the vendors which posed a high risk to the business for regulatory reporting
- As OMS was not scalable there were other interface systems getting the data from OMS for slow sand bed filters(Sandman), leakage reporting (OMS Leak, Netbase and Takadu) that were built around OMS
- OMS could hold only up to 40 days online data due to the infrastructure limitations.

Legacy system landscape



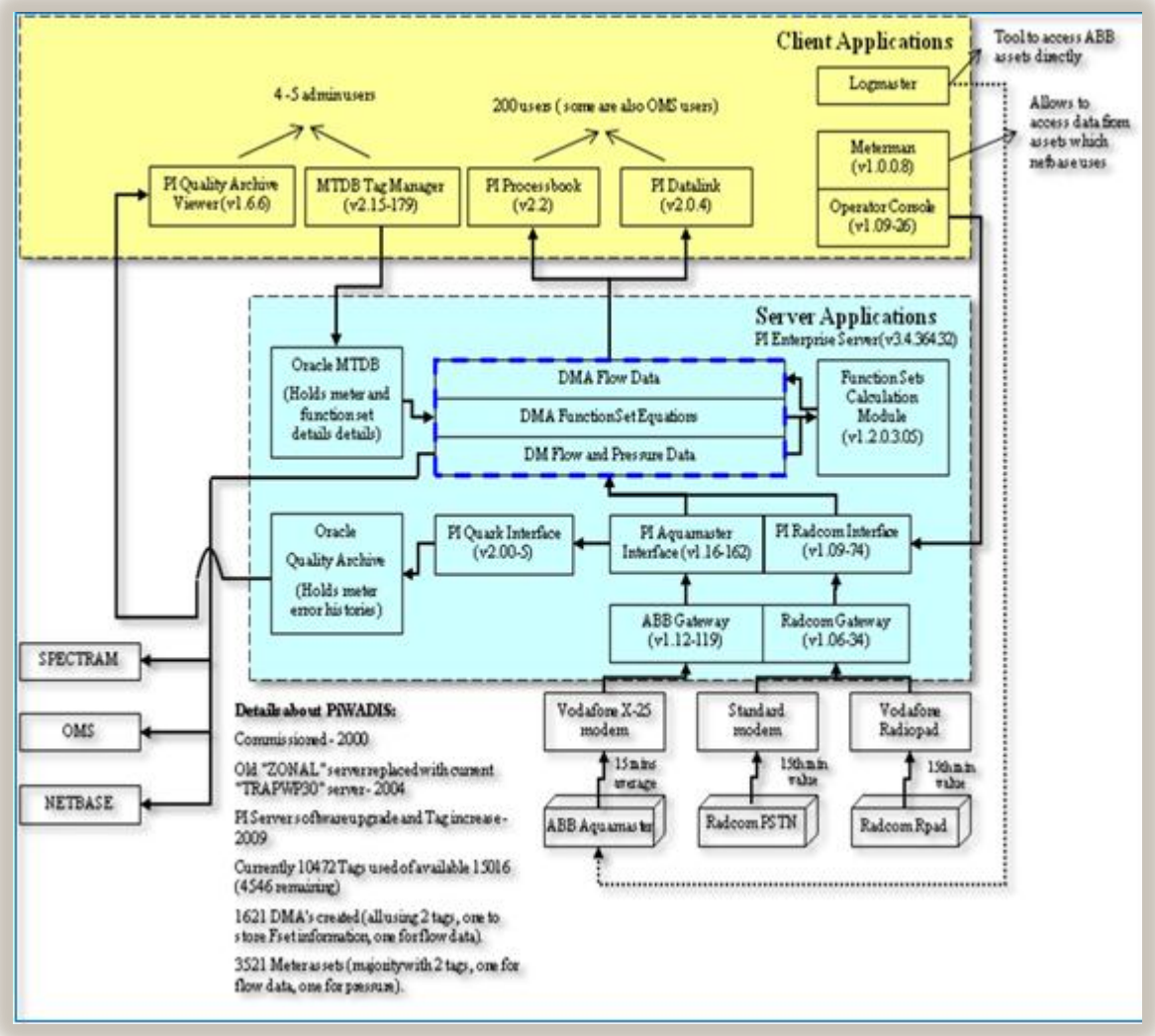
OMS ⟵

Spectram ⟶



Legacy system landscape contd..

PiWadis →



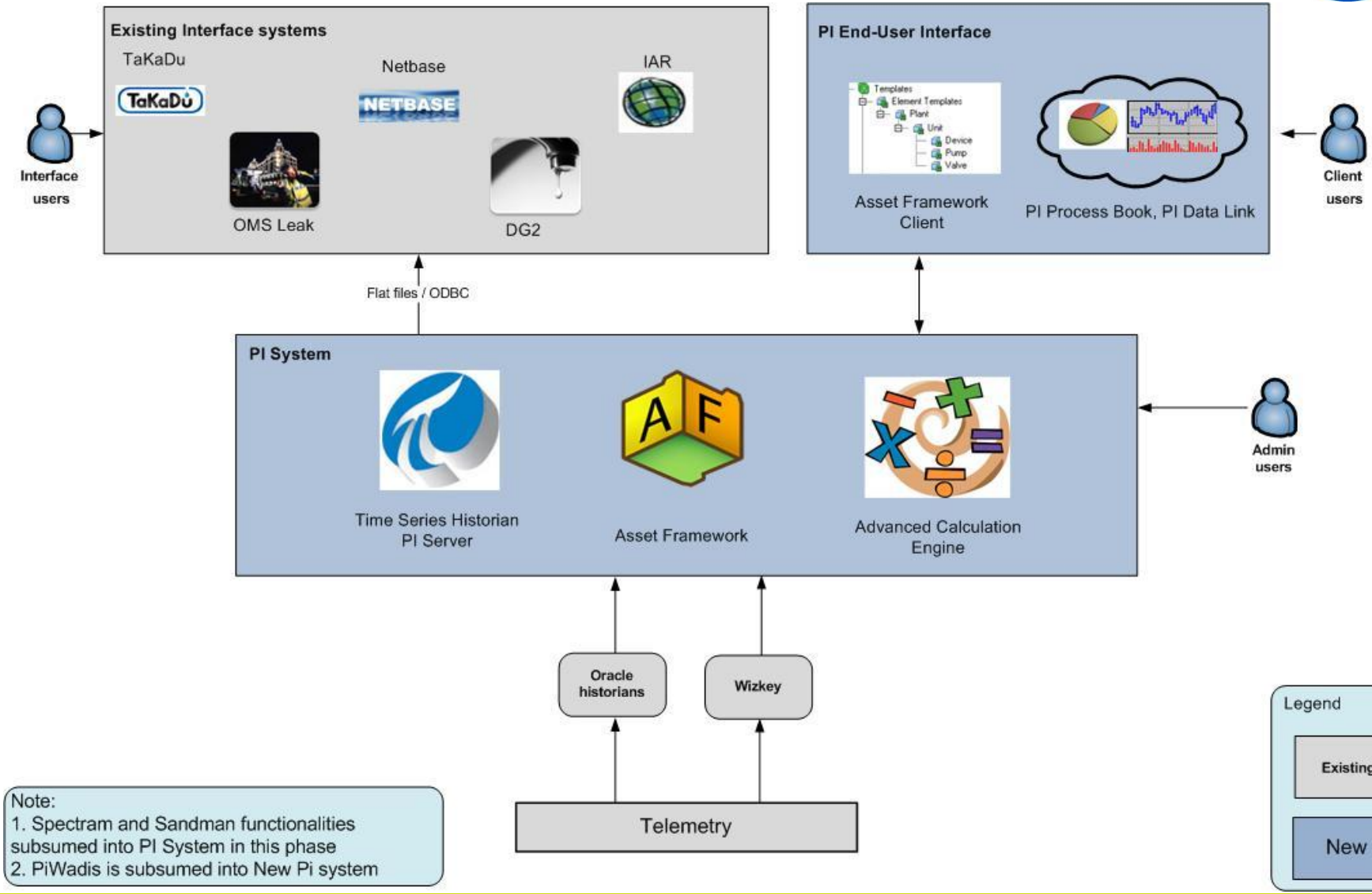
AORTA solution

- Wipro, the IS partner for Thames water carried out detailed analysis of the systems and the market study to replace OMS and its surrounding interface systems
- OSI PI was selected as a replacement product for OMS and its legacy interface functionality
- Thames Water district meter data was stored in an old PI System called PiWadis. The project provided an opportunity to migrate the PI functionality to PI2010
- The 20 years data from OMS was migrated to PI 2010 with thorough validations and data checks
- The regional SCADA data is currently stored in Oracle database. The project has migrated 7 years time series data and enabled the live data collection from the Oracle SCADA historians

AORTA Solution – contd..

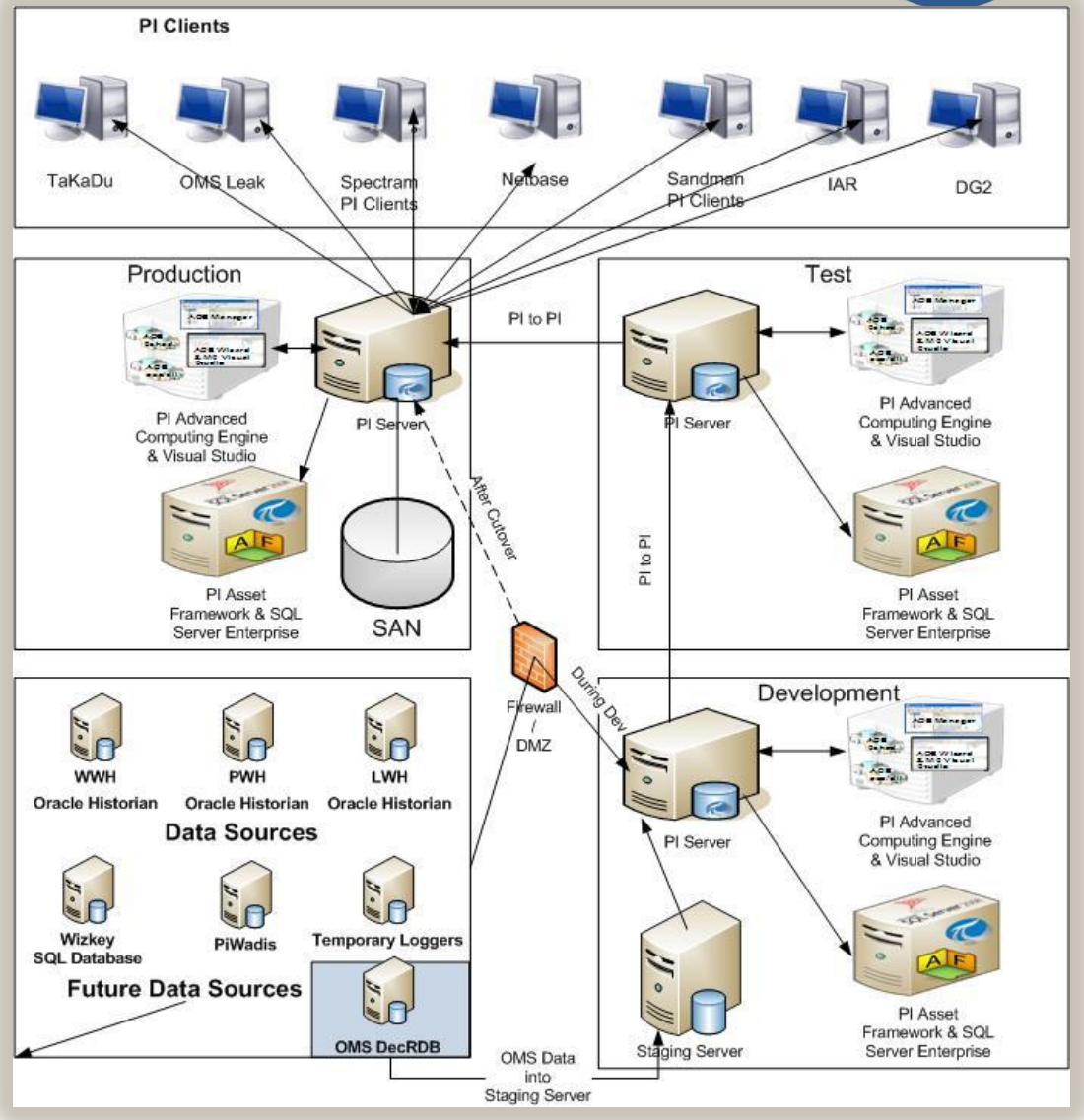
- About 120 K tags have been validated and incorporated into PI archive for regular monitoring
- Close to 500 schematics representing the areas have been re-validated, merged and implemented in PI 2010
- 3500+ daily calculations for leakage, regulatory, demands, flows have been incorporated in PI
- The slow Sandbed filtration process was implemented with PI tools
- Tools have been built for network analysis and optimisation
- Required training provided to teams using new PI application

AORTA - Solution contd..



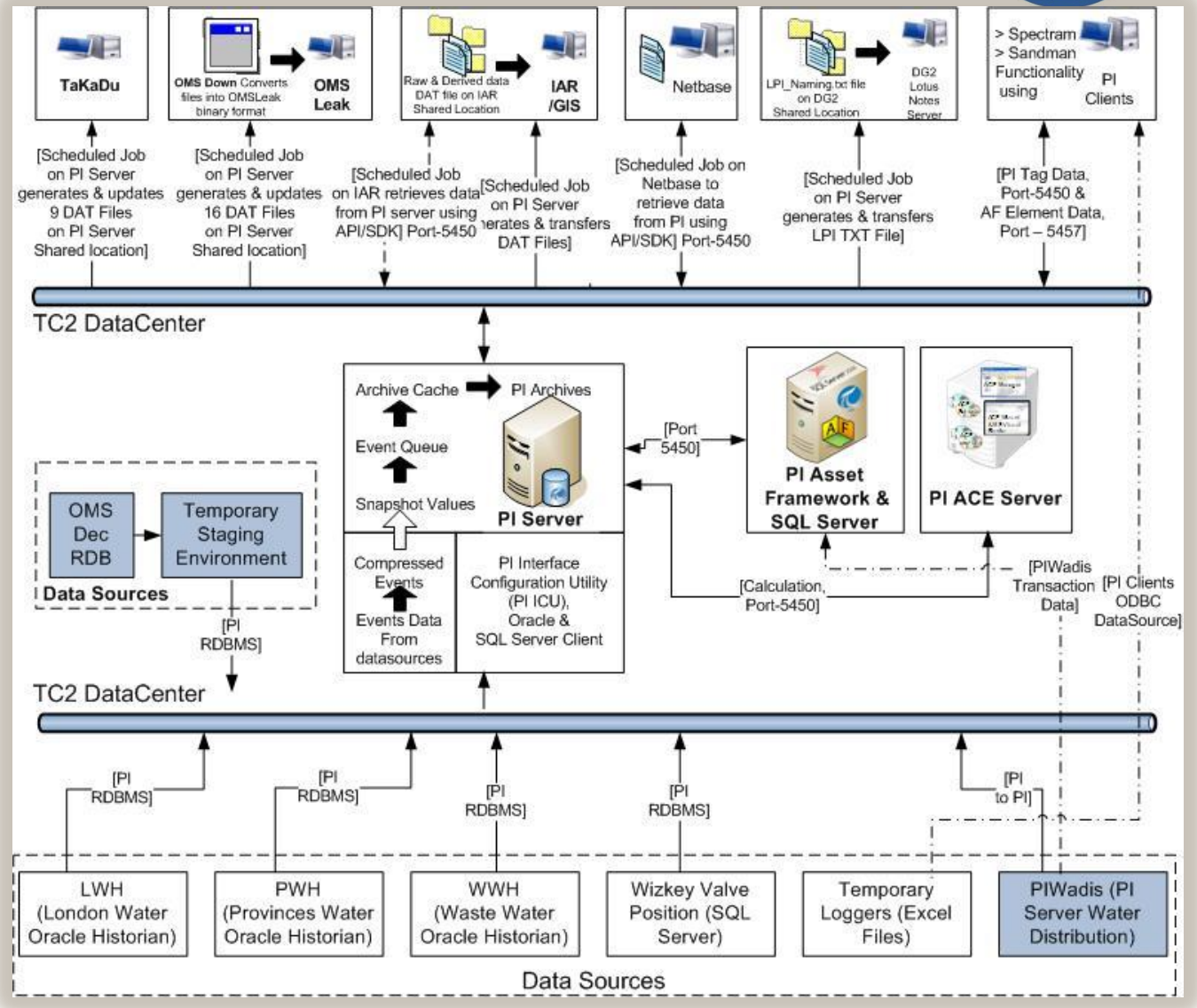
AORTA technical architecture

- Logical separation of business rules data presentation
- Data collection from discrete data sources
- Data storage and compression
- Common user interface
- Enterprise Connectivity and single version of truth



AORTA Data Flows

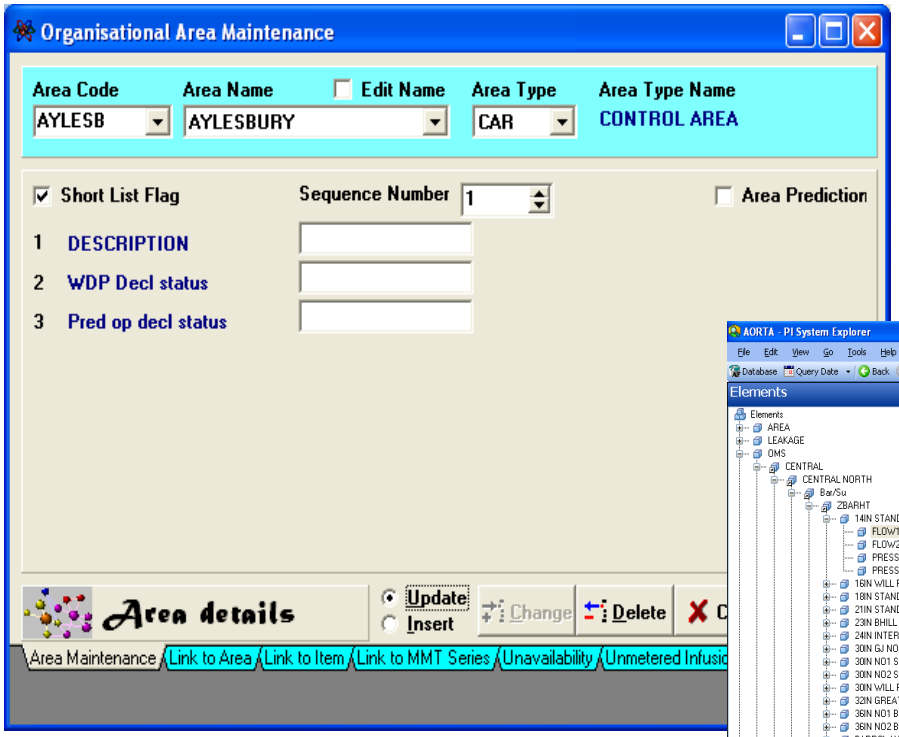
- Near real-time data for online users
- DG2 low pressure updates
- Daily demands
- Flow and pressures
- Derived reservoir flows



PI Tools used

- PI Asset Framework : configured about 10,000+ assets
- PI Server : Data historian
- PI ProcessBook : For schematic displays and trending, legacy functionality from OMS, Sandman, PIWADIS and Spectram
- PI DataLink : For the data retrieval and updates by administrators
- PI ACE (Advanced Computing Engine) : For reservoir calculations
- PI SDK, API and OLE DB : For the migration of legacy and interface functionality into PI
- PI RDBMS & PI to PI: To collect SCADA data from legacy historians
- PI SMT tools : For the administration

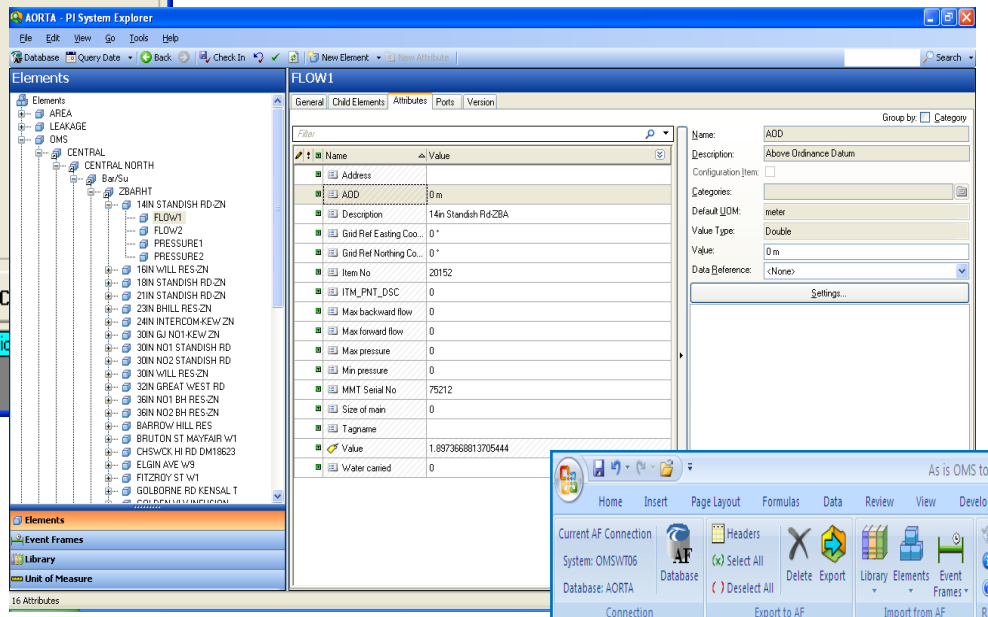
Screen shots - Administration

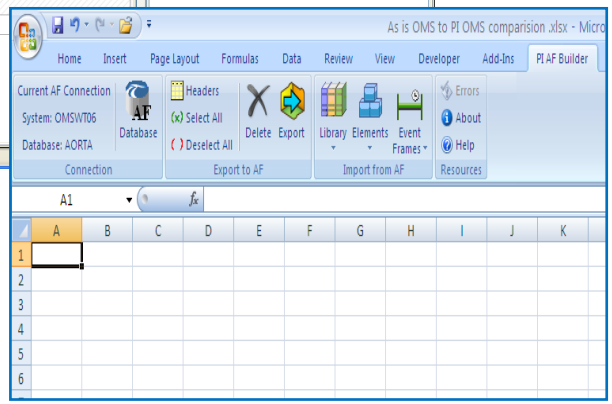


Before

AORTA

After

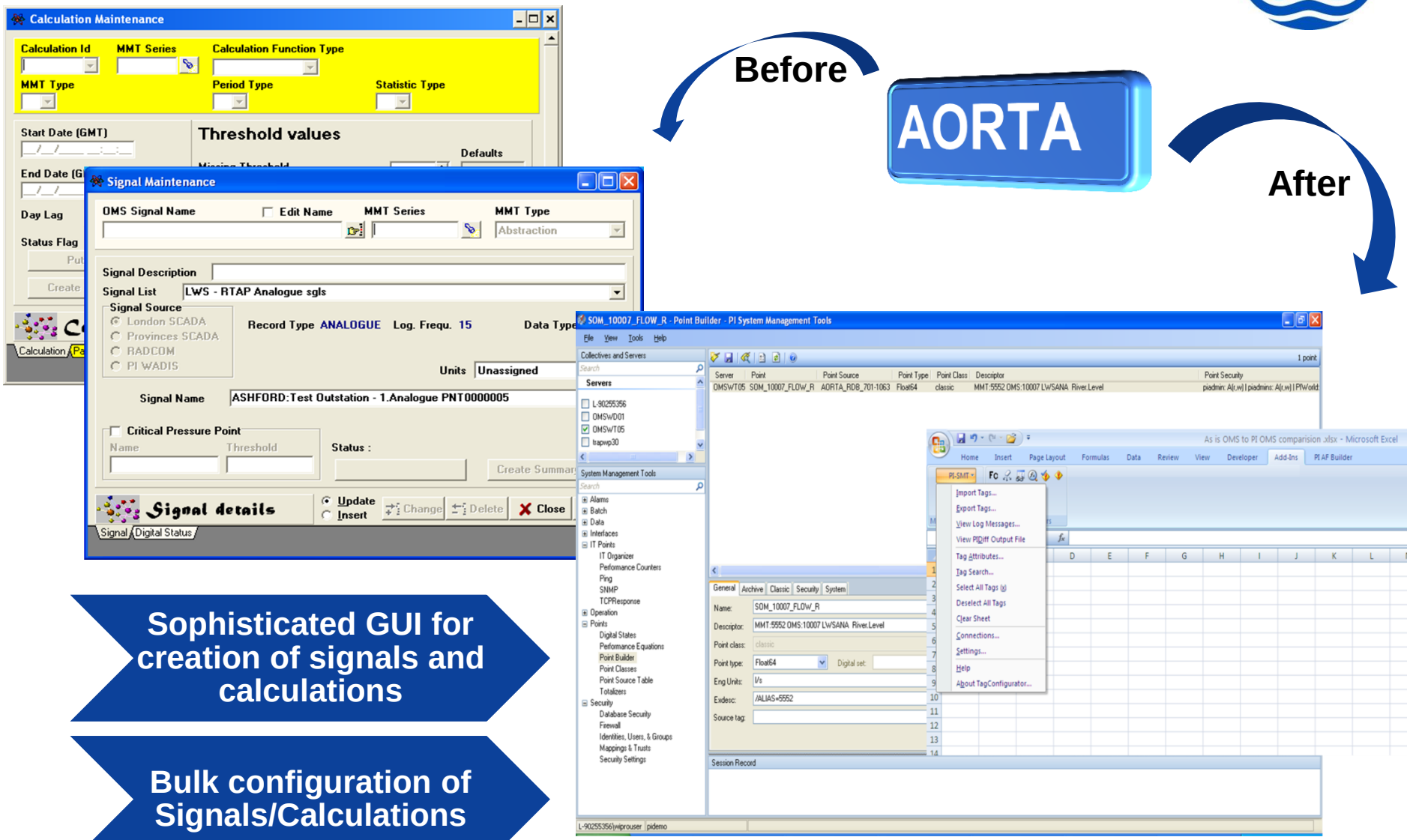




Simpler and visual creation of Asset hierarchy

Bulk configuration of Assets

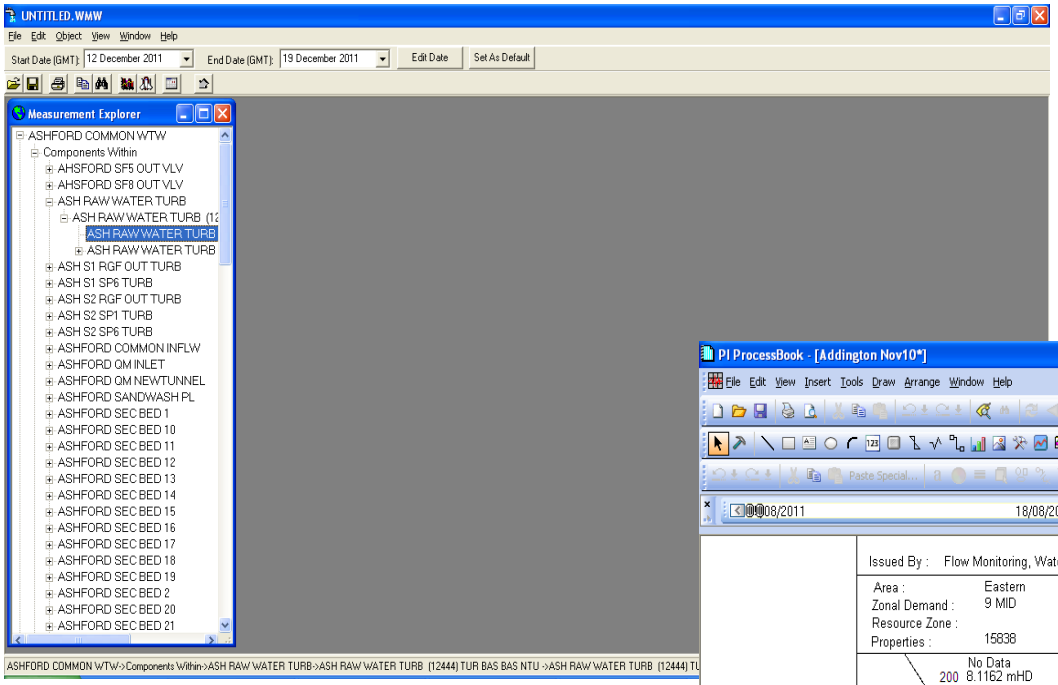
Screen shots - Administration



Sophisticated GUI for creation of signals and calculations

Bulk configuration of Signals/Calculations

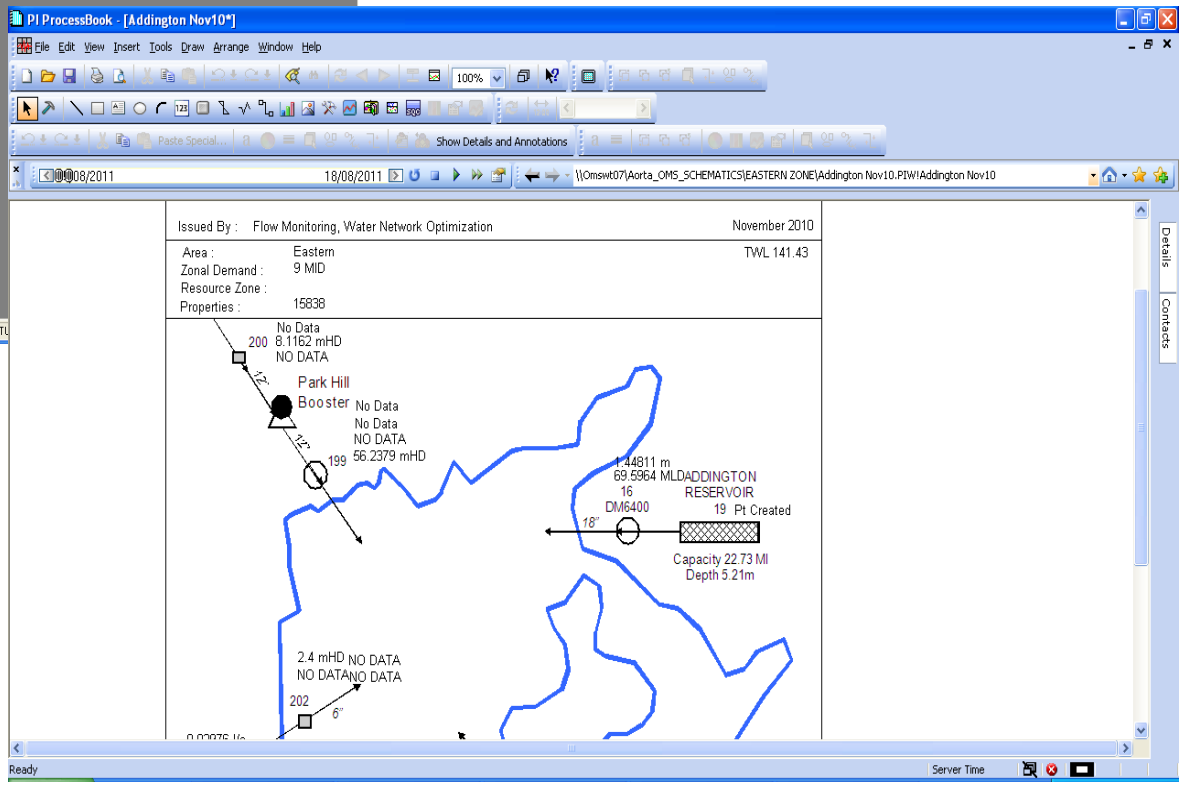
Screen shots - GUI



Before

AORTA

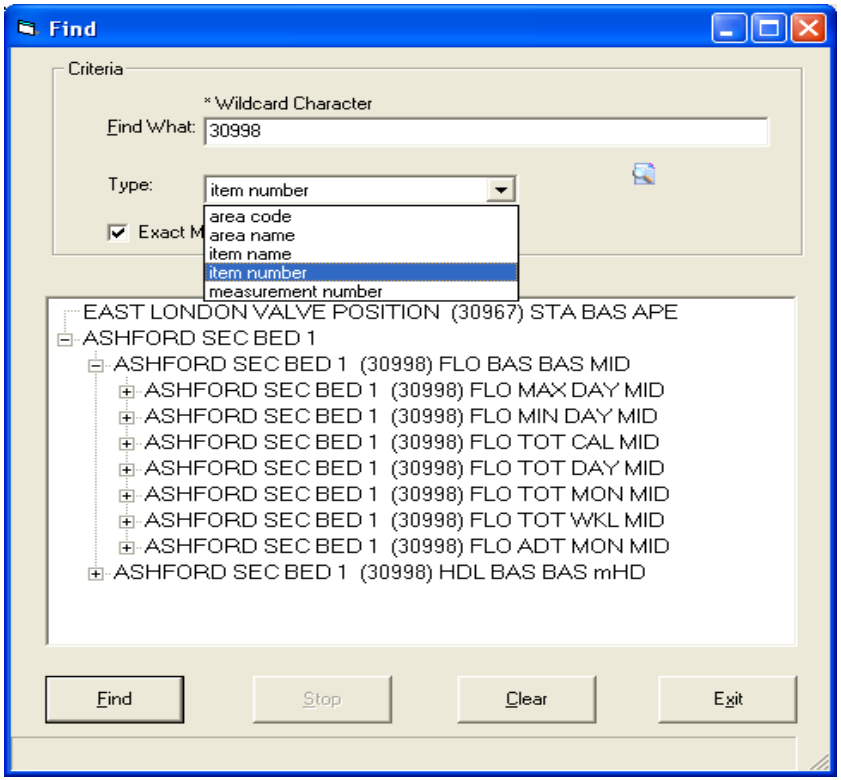
After



Ability to display the data in schematics views representing real life entities

Easy to use User interface

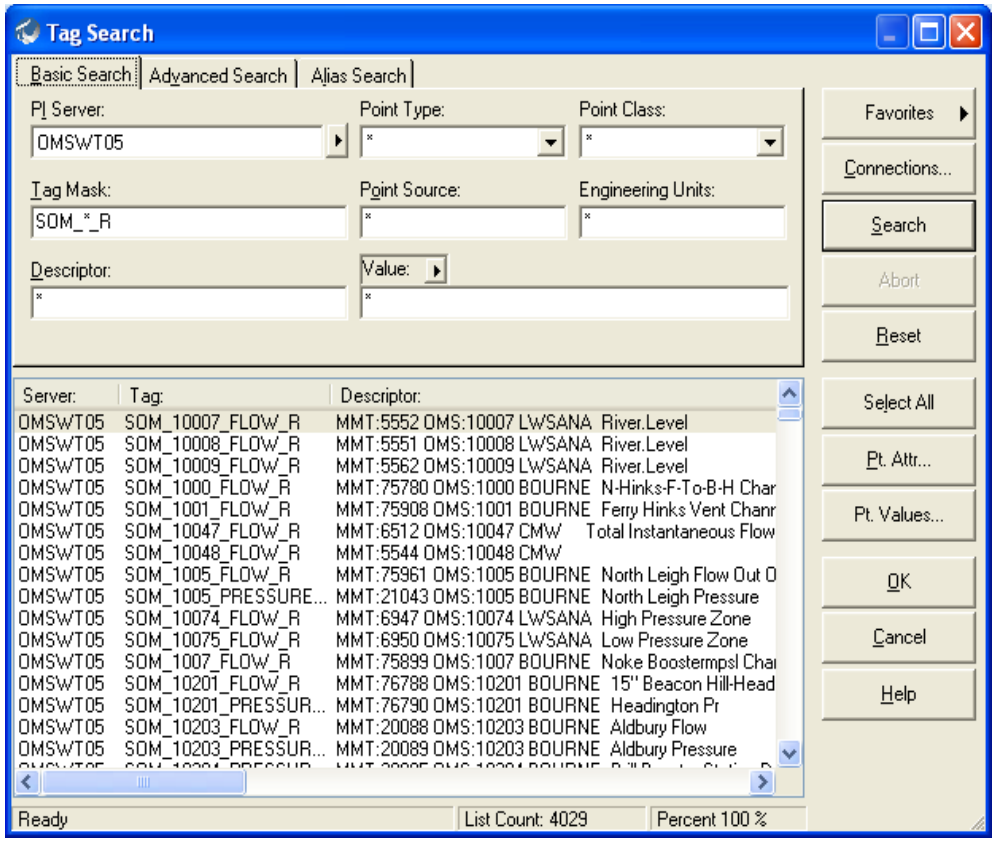
Screen shots - GUI



Before

AORTA

After



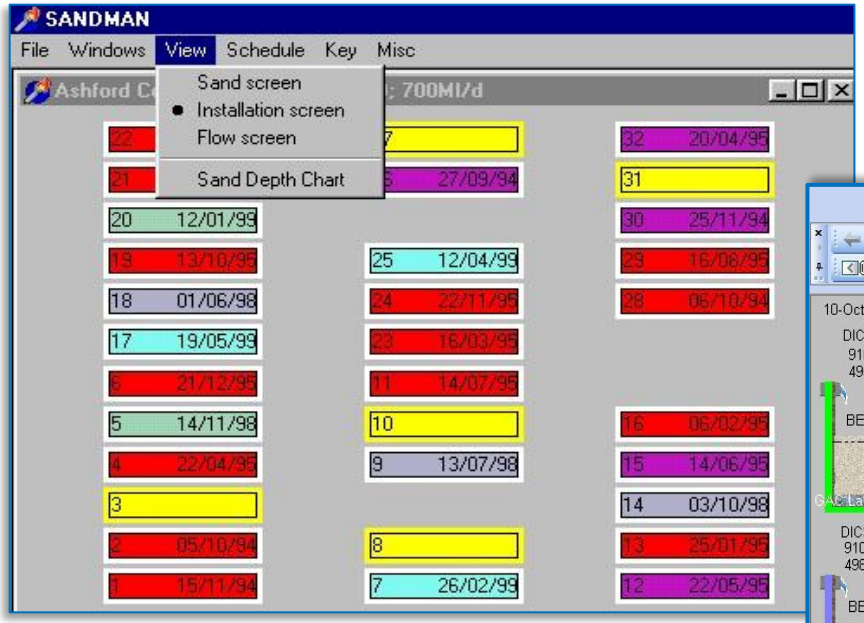
More search options including the wild card search

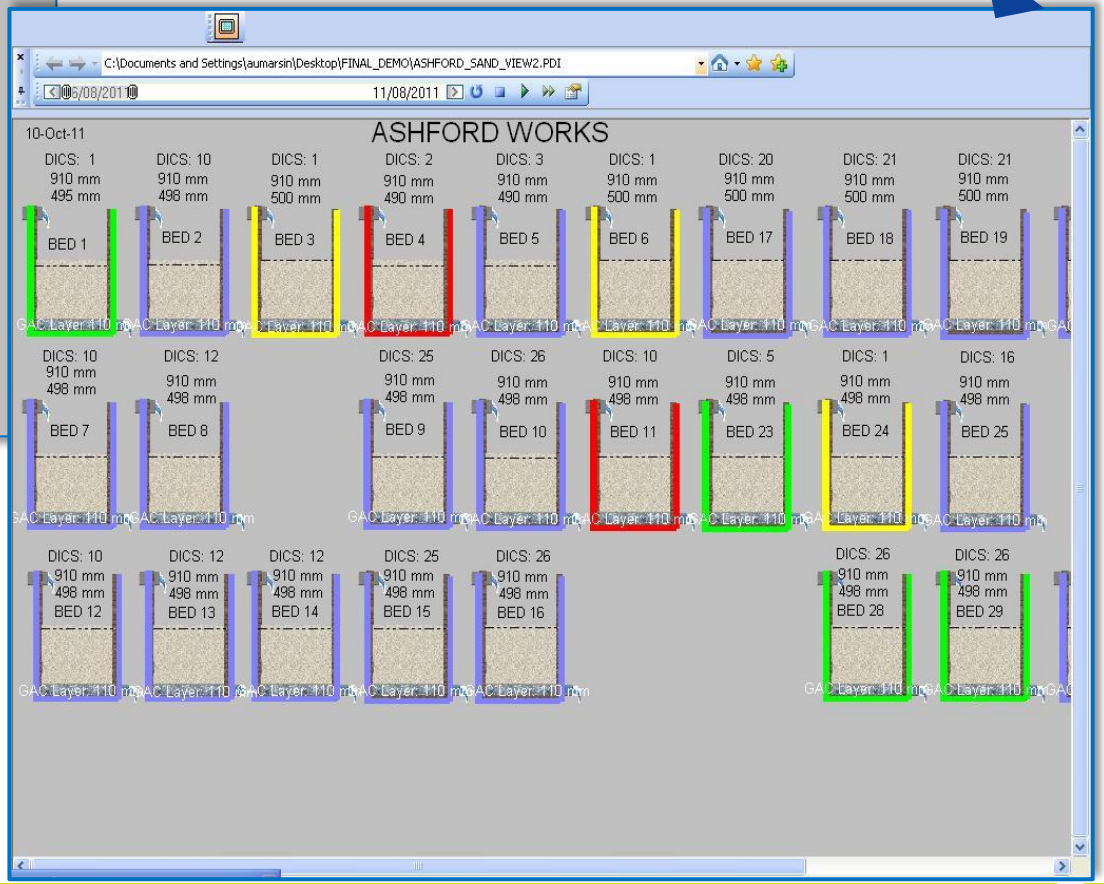
Screen shots - GUI

Before

AORTA

After

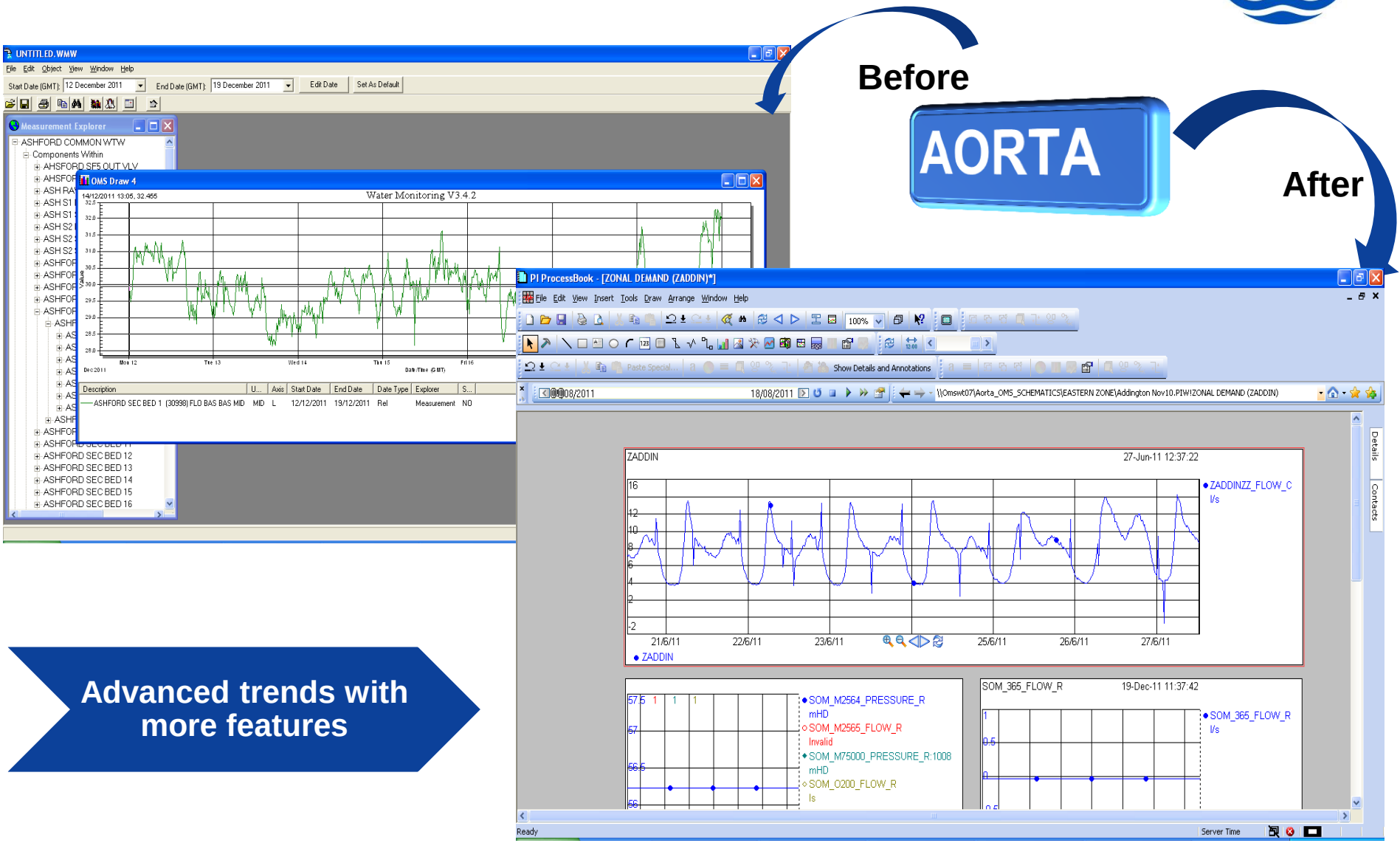




Clearer, easy to understand graphic representation

Various states of the works beds are visible in a Single View

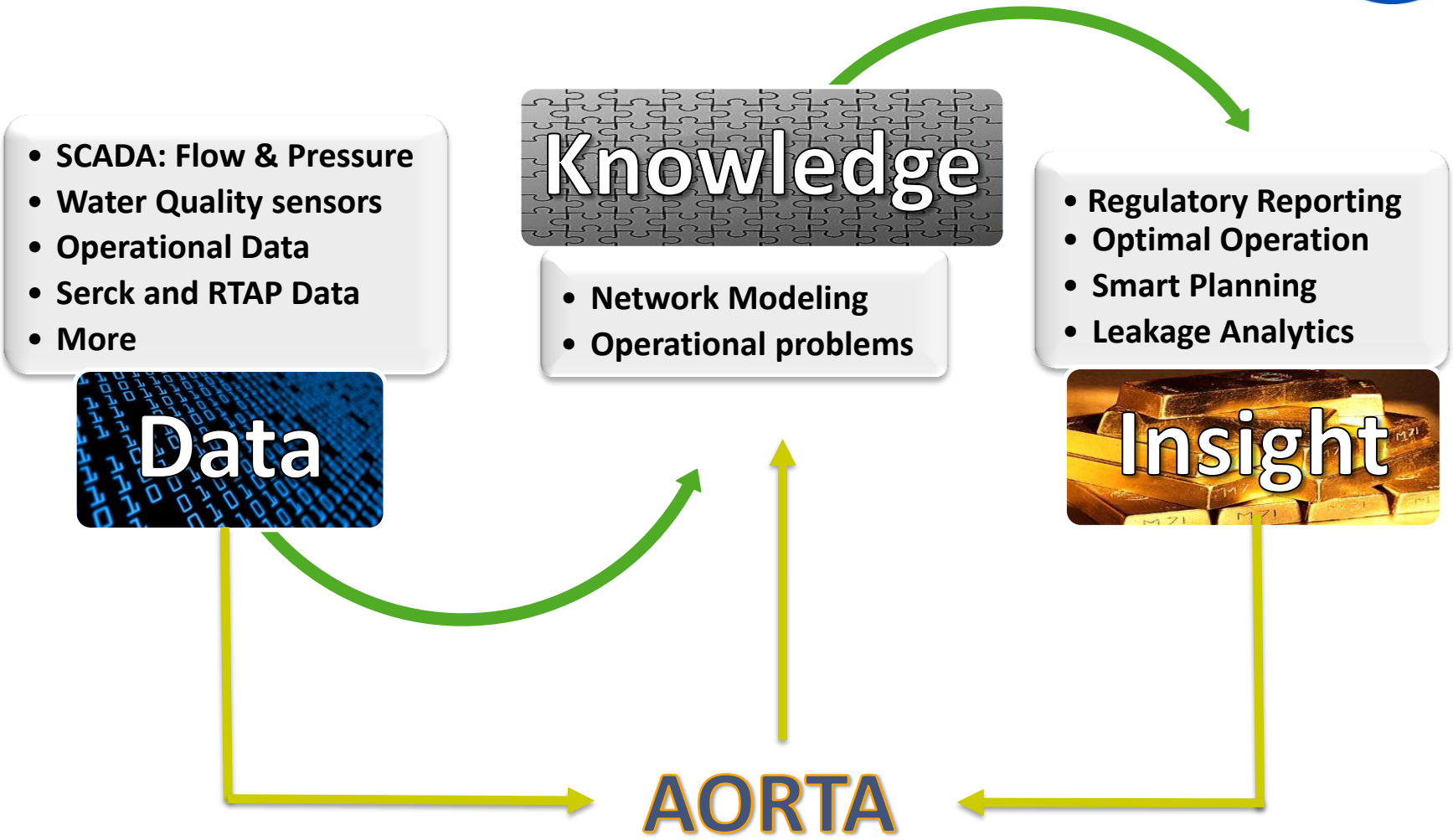
Screen shots - trends



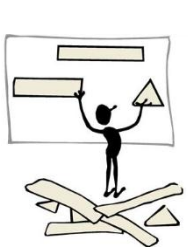
How PI helped

- Risk avoidance from aging systems
- Single version of truth
- Faster and more reliable applications
- Daily demand flows
- Ease of access to data for user specific analysis
- Reservoir calculations
- Simplified administration
- Same home for regional and district meter data
- Olympics Village schematics

Future plans for PI



Future plans for PI – contd…



Reporting

Interactive Data Landscape

PI Utilities

PI Tag Library

Daily Monitoring

- Production Planning
- Abstraction
- Pressure Monitoring
- Distribution Input
- Water In Supply
- Mass Balances
- Olympics zones

Oracle Historians

Control Systems

- Selective Metering Data
- RTU Data
- Energy
- SERCK
- Regional SCADA
- PLC Data
- RTAP

Future plans for PI – contd…

- PI Applications for maintenance of filter beds
- KPI Analysis and weekly reporting
- Integration with Energy Monitoring
- SCADA and business integration
- Event monitoring
- Leakage Reporting
- Production Planning

THANK YOU

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