



American Water Works Association  
**Pacific Northwest** Section

# Intelligent Water & Organizational Culture

## A Tale of Two Cities

May 1, 2015

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**Regional Manager**  
**GE Software**  
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# Intelligent Water & Organizational Cultural - Definition

- **“Implementation and operation of software solutions that seamlessly interface with each in order to achieve greater productivity, responsiveness and analytics through out Water operations”**
- Nationally, water utilities are spending > \$1B per year to incorporate Intelligent Water technology solutions and work processes through individual business, automation and modeling platforms
- Utilizing the systemic approach outlined in this presentation, these individual platforms can deliver their full potential because of proper assessment, planning, integration and the necessary cultural evolution to leverage them organizationally

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# Intelligent Water & Organizational Cultural – Key Points

- Adopt an Entrepreneur approach, “it’s business” - **Innovate**
- Perform needs assessment, use the results as a roadmap - **Plan**
- Account for flexibility culture & technology - **Plan**
- Utilize cost effective, open architecture based technologies that link business, modeling and automation platforms - **Strategy**
- Phase in technology & business process changes - **Strategy**
- Ultimate goal of an Integrated Enterprise Wide ecosystem with workforce trained & empowered to consume & evolve the applications, processes and culture to continue driving greater efficiency, consistency and accountability- **Success**



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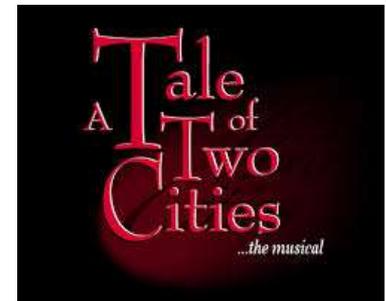
# Technical & Cultural Context – “A Tale of Two Cities”

## Large City ~ 2.2MM Metro

- 2 WTP's
- 15 Booster Stations
- 7 WWTP's
- 3 Package TP's
- 3 RTC Stations
- 120 Lift Stations
- 3K mi. Water Mains
- 3K mi, Sanitary Sewer
- 133 MGD avg. Fresh
- 186 MGD avg. Waste

## Small City ~ 70K Metro

- 13 WTP's
- 3 Storage Tanks
- 19 Wells
- 11 Iron Filter Plants
- 1 HS Pump Station
- 64 Lift Stations
- 360 mi. Water Mains
- 355 mi, Sanitary Sewer
- 8 MGD avg. 20 MGD max.



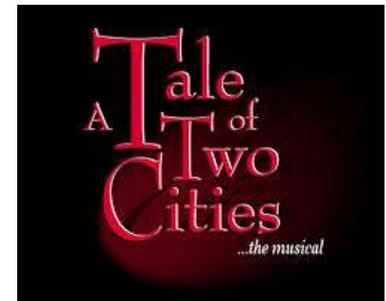
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- **Decision support tool for managing mandated/regulatory requirements regarding Combined Sewer Overflows (CSO) & Sanitary Sewer Overflows (SSO)**
- **Project includes upgrades to existing SCADA System and Historical Data Collection and Reporting Systems**
- **Incorporates e-SOP’s and Process Analytics**
- **Accelerate assessment & validation of project requests for CIP funding**

### Cultural

- **Integrated processes, want to become the lowest cost utility to act as a model for the industry**
- **Expand utility services through innovation**
- **Utilize technology for new revenue sources, expanded territory, business services/consultancy, etc.**



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- Needed to link SCADA, CMMS and DMS together to generate e-SOPs and Work Orders automatically from real-time data
- Middleware provided an asset oriented structure and execution engine based on standard configuration (API) and programming, eliminating custom/proprietary coding and the associated complications
- Operational & process improvements enabled cost savings
- Accelerate assessment & validation of project requests for CIP

### Cultural funding

- Significant staff losses/retirements created a need to capture domain knowledge and best practices for managing “more with Less” and as a resource for new Field Tech’s (all Union workforce)
- Operations & Field Workforce rallied around the unification of the business brought on by this technology & have continued to expand



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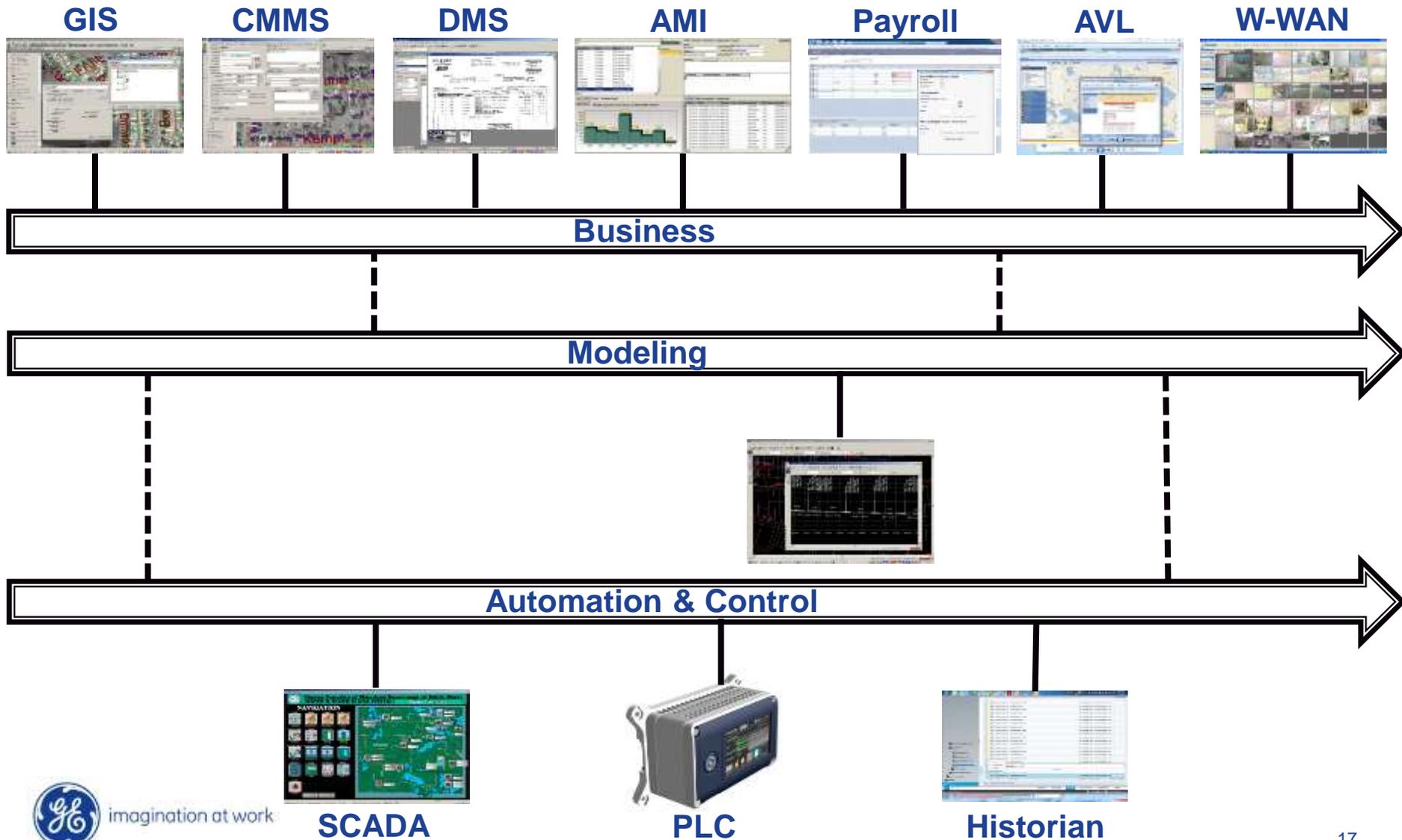
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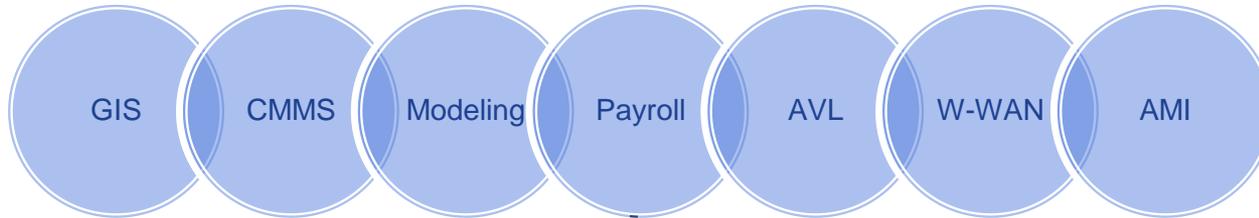
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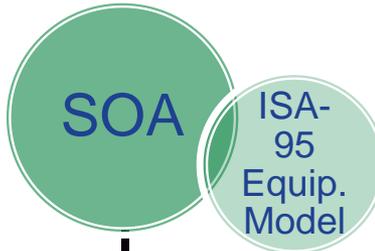
# Overview - Stand Alone and Disconnected Platforms



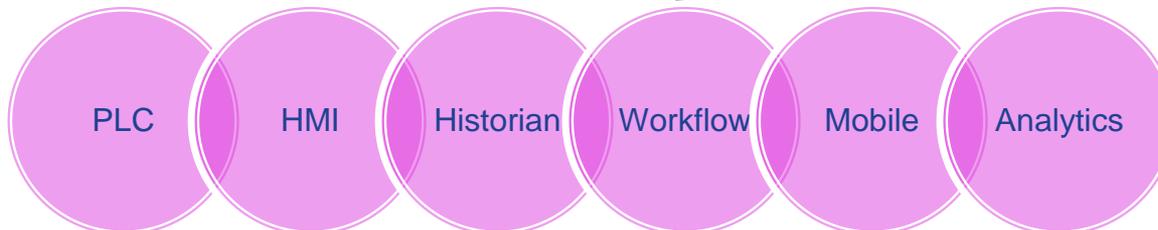
# Overview - Integrated Business, Modeling, Automation Platform



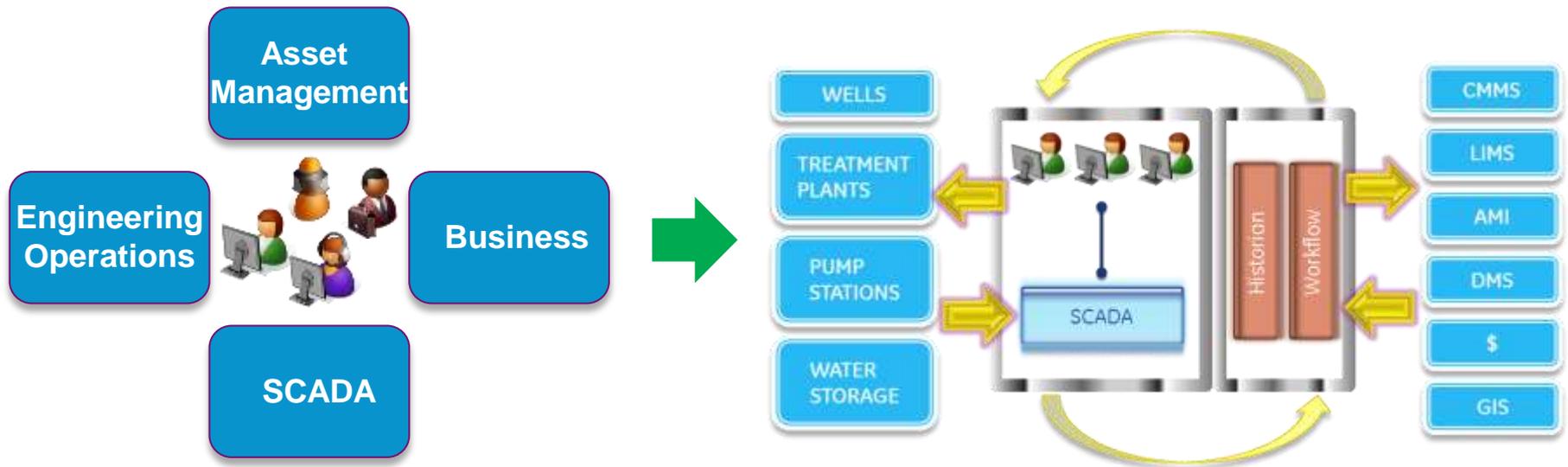
**Business-Modeling**



**Automation & Control**



# Intelligent Water – Platform Connectivity & e-SOPs

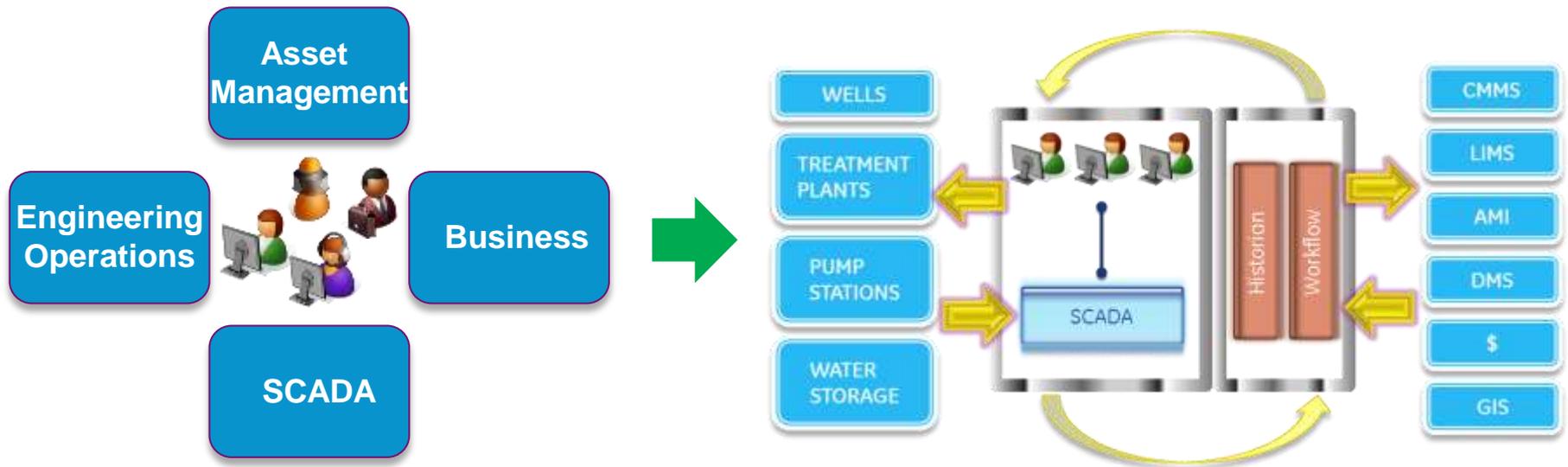


## Leverage technology investment by integrating them through SOA:

- Reduce manual collaboration, duplicate effort, information silos, analysis gaps, operational inefficiency and reactive operations
- Real-time calculation of water efficiencies and energy usage
- Automatically trigger eSOP's on defined alarm events to ensure timely and best practice resolution
- Automatically trigger work orders from alarm events to capture labor and material costs



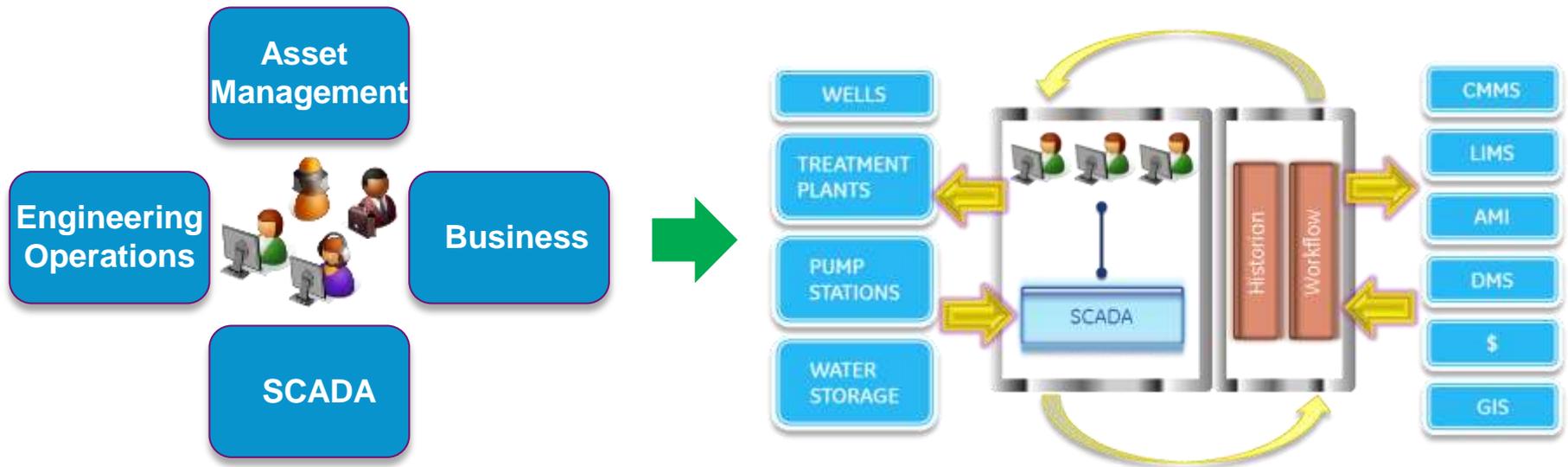
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# Intelligent Water – Advanced Analytics



## Leverage real-time historian and other relevant platform

data to perform powerful process and operational analysis to predict process abnormalities and rank most probable causes to correct them

- Ensure greater regulatory compliance at lower cost
- Analyze and reduce energy and chemical usage through process optimization
- Automatically correct process inefficiencies and/or trigger eSOP's to appropriate staff for corrective guidance

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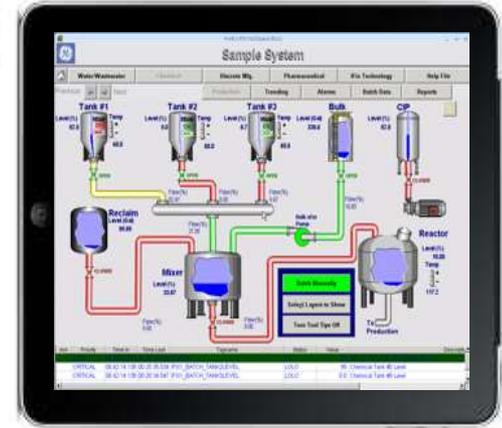


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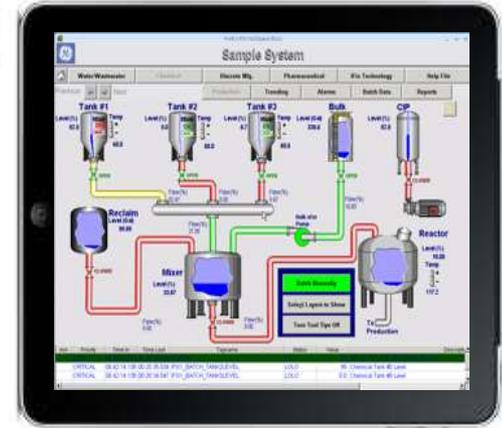
# Intelligent Water - Mobility, e-SOP, Geo-Intelligence, Decision Support, Anytime, Anywhere



## Real-time Operational Intelligence to predict events and drive action by providing the right information to the right people anywhere and anytime:

- Optimize staff resources making them proactive vs. reactive while reducing costs
- Ensure greater regulatory compliance due to fast intelligent information dissemination anytime anywhere
- Decrease response times through mobile interface displayed on desk top and/or smart device of your choice
- Instant view of KPI and health index indicators, chart trends and key asset relationships

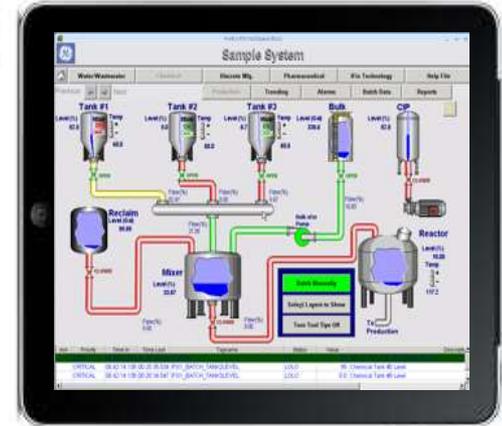
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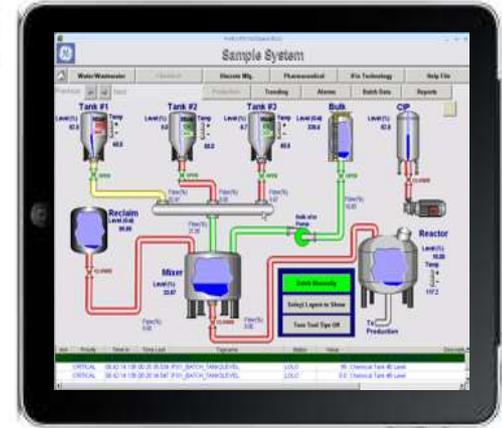
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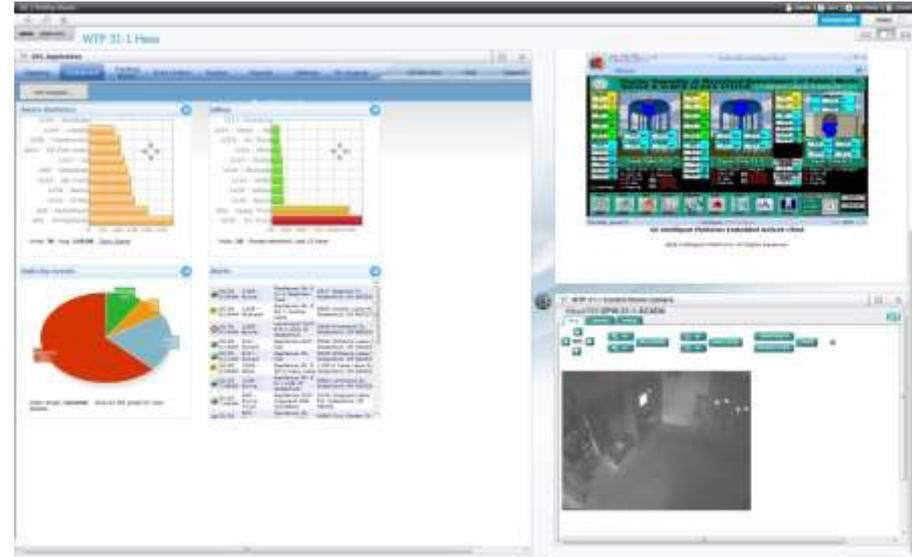
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## Secure single container for browser, user roles, tasks and dashboards:

- React quicker to changes
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# Intelligent Water – Organizational/Cultural

## Initiatives

- Define organizational needs and goals aligning positions and classifications with mission needs and objectives
- Establish Enterprise IT oversight committee
- Standardize core computer hardware and software platforms
- Justify need for needed full-time technical staff to implement and support technology initiatives
- Create culture of personal and professional growth
- Work to build organizational trust through fair and consistent staff accountability doctrine
- Create culture that recognizes the importance of safety
- Disseminate programs and organizational info governing bodies and public regularly
- Do not computerize bad business processes



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# Intelligent Water - Summary and Real World Illustration

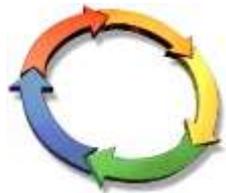
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## Treatment, Distribution and Collection Operations

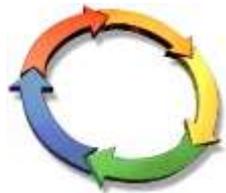
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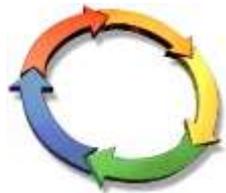
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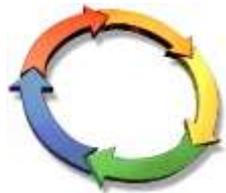
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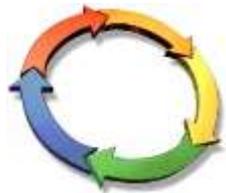
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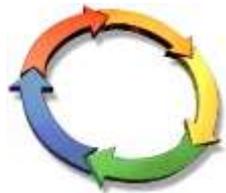
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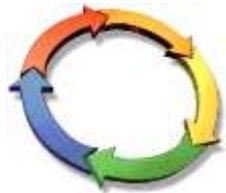
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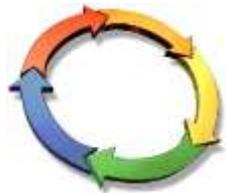
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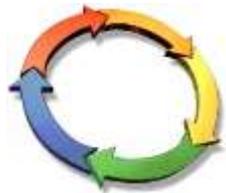
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- Enhanced terrorist and/or other system contaminant event detection and prevention
- Consistent best of practice control and response to problems
- Daily water efficiencies and real-time leak detection
- **Optimized water quality and water quality analysis**
- Exception based monitoring and alarming with data for forensic analysis



# Intelligent Water Advantages

## Treatment, Distribution and Collection Operations

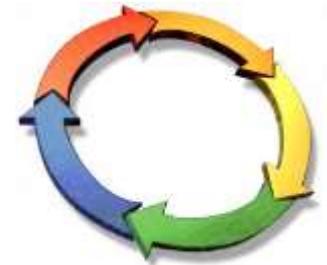
- Optimized operations reducing energy, chemical, equipment and labor costs
- Improved hydraulic transients and water main breaks
- Reduced pump station failure and SSO's
- Continual real-time system and process feedback & analysis
- Enhanced terrorist and/or other system contaminant event detection and prevention
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# Intelligent Water Advantages

## Labor

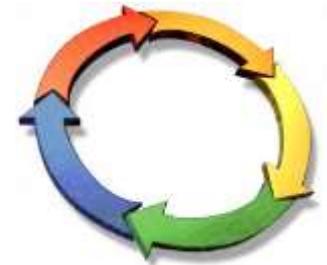
- **Reduced lost work days and Worker Comp claims**
- Proactive thriving flexible organizational culture
- Highly trained, licensed and cross trained staff
- Empowered and proactive staff
- Timely and accurate project review, information dissemination, and customer service
- Timely and accurate response to operational and process problems



# Intelligent Water Advantages

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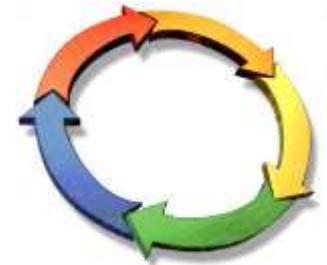
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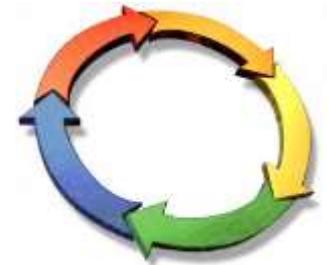
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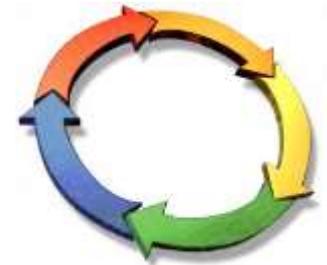
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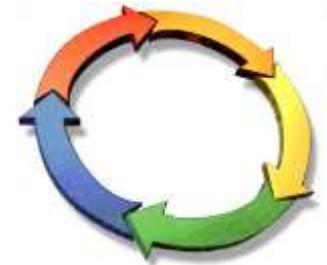
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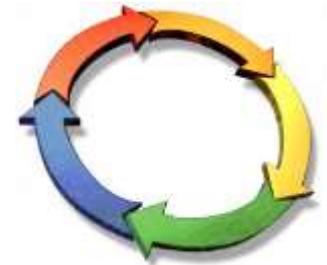
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# Intelligent Water Advantages

## Operational-Capital Planning

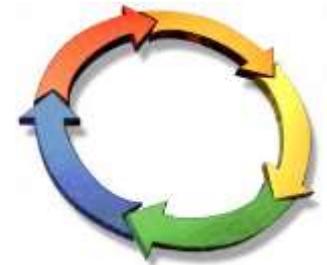
- **Increased project justification and ROI capability**
- Asset readiness and service life optimization
- Integrated data for better operational and capital infrastructure planning
- Maximized use of application expenditures through integration
- Integrated hydraulic water and sewer modeling
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# Intelligent Water Advantages

## Operational-Capital Planning

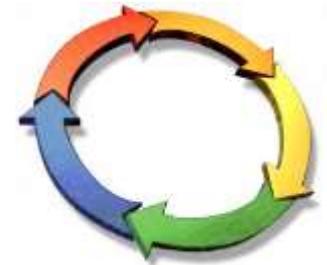
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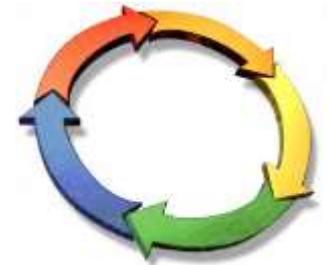
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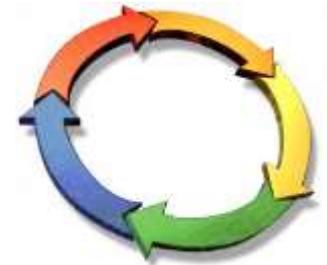
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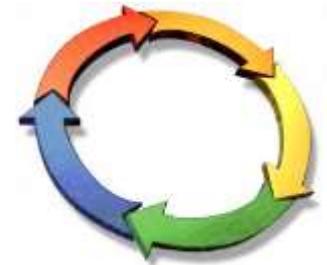
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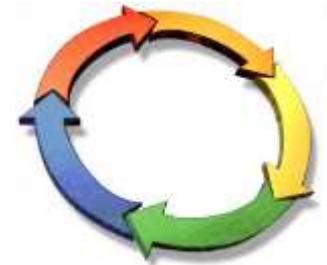
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# Integrated Intelligent Water Advantages

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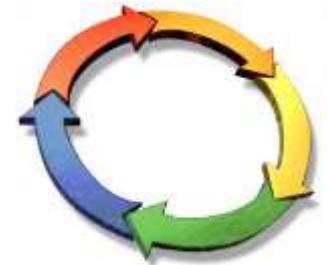
- **Proactive customer service, response and accountability**
- Public empowerment and awareness through Online Customer Service Portal, Billing and other operational and informational programs
- Improved water system ISO rating lowering customer insurance
- Enhanced public-utility relationship



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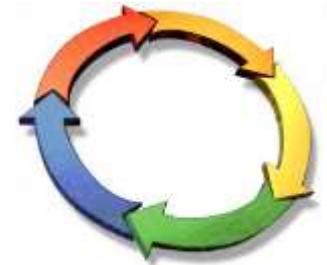
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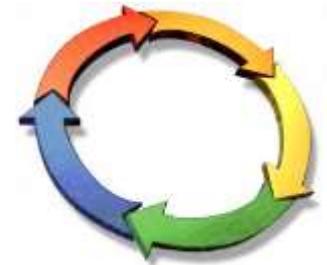
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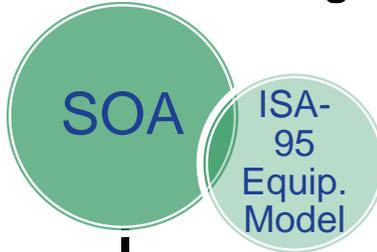
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# Intelligent Water = Measureable Results!



Business-  
Modeling



Automation & Control

