AUTODESK UNIVERSITY

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Digital Twins with Info360 for Past, Present, and Future State of Networks and Plants

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Learning Objectives

- Discover the ROI of operational digital twins for the water industry.
- Learn about collaborating with operational analytics and AI for problem-solving.
- Learn about your journey to adoption of water digital twins.
- Learn about integrating your multiple data models for use across your organization.

Description

We can now use operational digital twins to apply the past, present, and future conditions at the level of the asset to solve key problems and meet objectives for water networks and plants. With Autodesk's Info360 platform, trust in these systems has reached a point where simulated predictive "what-if" scenarios actively support responses to planned and emerging incidents with real-time artificial intelligence (AI) recommendations informing the optimization of networks and plants. The technological focus of this industry talk will be on operational digital-twin use cases. With a goal to reduce water loss to 10% by 2030, Water Corporation of Western Australia uses data-driven models to understand pressure and flow management with live physics-based models for pressure optimization. North American utility's water treatment plant optimizes chemical costs while maintaining compliance with predictive AI, achieving a 13% savings (US$170,000) in ferric costs while meeting turbidity discharge compliance limits.

Speaker(s)

Patrick Bonk

Global Product Marketing Manager for Autodesk's Operational Analytics and AI solutions within AEC Design-Innovyze. Patrick has been a professional Environmental Engineer for over 10 years with experience in hydrologic/hydraulic water/wastewater modelling including experience in human centered design & user scenario development to transform user needs into product design concepts. To contribute to the adoption of smart water technology globally, Patrick serves on the SWAN APAC Alliance's leadership team as Co-Chair of the Alliance's Communications Group.

Eland Afuang

Eland is a Software Solutions Engineer with Innovyze with +15 years experience in the industry specializing in network simulation, systems planning and operational modelling of water distribution systems. Eland has led the implementation and technical support on a wide variety of projects using Digital Twin water and wastewater network modelling/analytics systems across Australia and Asia Pacific.

Javier Cantu

Javier Cantu, a Solutions Architect with Innovyze an Autodesk Company's Operational Analytics and AI solutions and has led the implementation and technical support on a wide variety of projects using Digital Twin water and wastewater network modelling/analytics systems across the Americas and EMEA. Javier has presented at major industry conferences in digital transformation, artificial Intelligence, and simulation tools for the water market.

Mike Pennell

Currently leading an innovative team and product that is improving the efficiency of water and wastewater treatment by providing prescriptive operational recommendations based on real-time and forecasted conditions. Successful entrepreneur with track record of developing enterprise solutions, raising capital, building teams and defining business models that grow from start-up to product launch, profitability, acquisition and transition. Senior software executive with 20+ years' experience leading data science, product management, sales & marketing, development, and service teams.

Industry Overview & Operational Opportunities for Digital Transformation

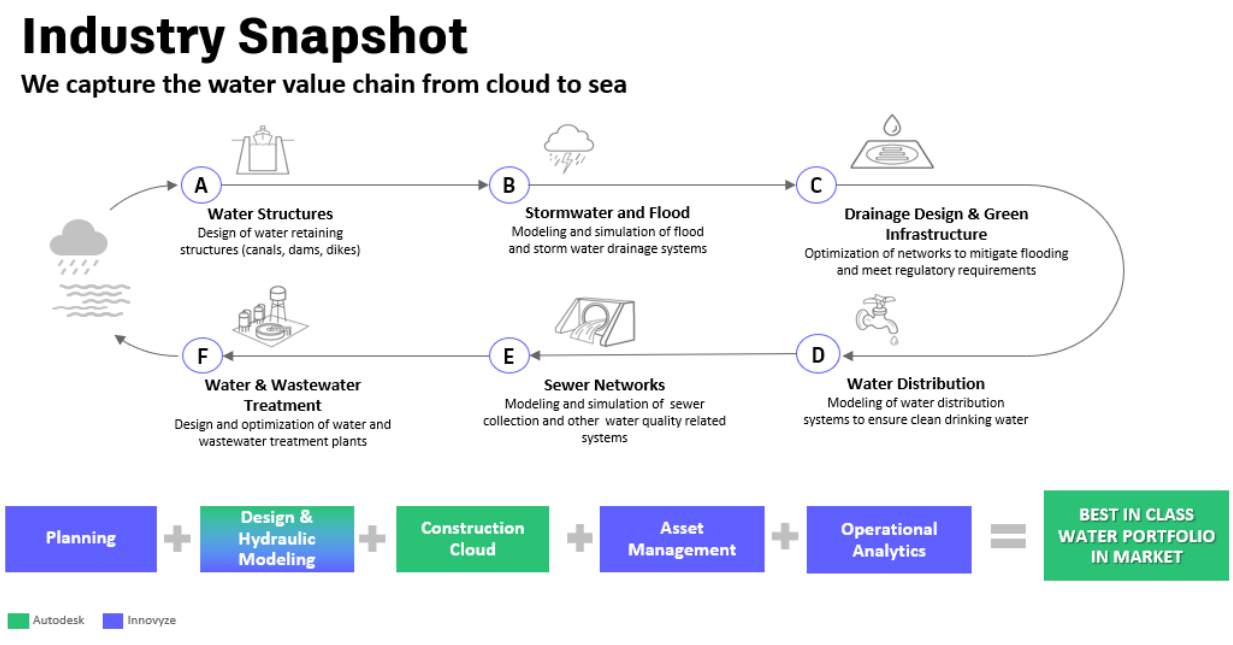
Innovyze Joins Autodesk to Cover Entire Water Value Chain

For more than 3 decades, Innovyze has been a global leader in software and analytics for the water industry, helping over 6,000 customers in 60 countries plan, design, analyze, simulate, operate, and maintain water infrastructure.

In March of 2021, Innovyze was acquired by Autodesk for $1 Billion, representing Autodesk's incredible commitment to building a more sustainable world through end-to-end water infrastructure solutions.

With Innovyze solutions, Autodesk now covers the entire water cycle from rainfall to ocean, ensuring delivery of clean drinking water, safe sewerage, protection from floods, asset maintenance and risk mitigation, and optimal water infrastructure performance.

All of these stages involve the general project phases as listed below from planning to real-time asset management and maintenance of your build infrastructure. Innovyze and Autodesk now touch all of these areas.



Autodesk + Innovyze solution portfolio covers the water value chain from cloud to sea.

Operational Opportunities for Digital Transformation

From the beginning 'to the end of time' utilities will always be addressing the degradation, capacity and operational effectiveness of their assets.

The issues are many, but a few key challenges are causing significant disruption:

- **Aging infrastructure** is failing at an accelerating rate. In America, where pipes laid more than 100 years ago are still in use, a water main breaks every 2 minutes, and leaky pipes lose more than 2 trillion gallons of water each year.
- **Widespread workforce retirement** by the baby boomer generation is taking a mass of tribal knowledge out the door and creating an information gap and **skill shortage** for the next generation of water utility workers.
- **Population & development growth in urban areas** continues to outpace the capacity of water systems, despite best efforts to anticipate and build for future residential and commercial needs.
- R**egulatory requirements** associated with water safety, availability, and reliability are increasing, as are the consequences of non-compliance, driving utilities to focus on service delivery at any cost

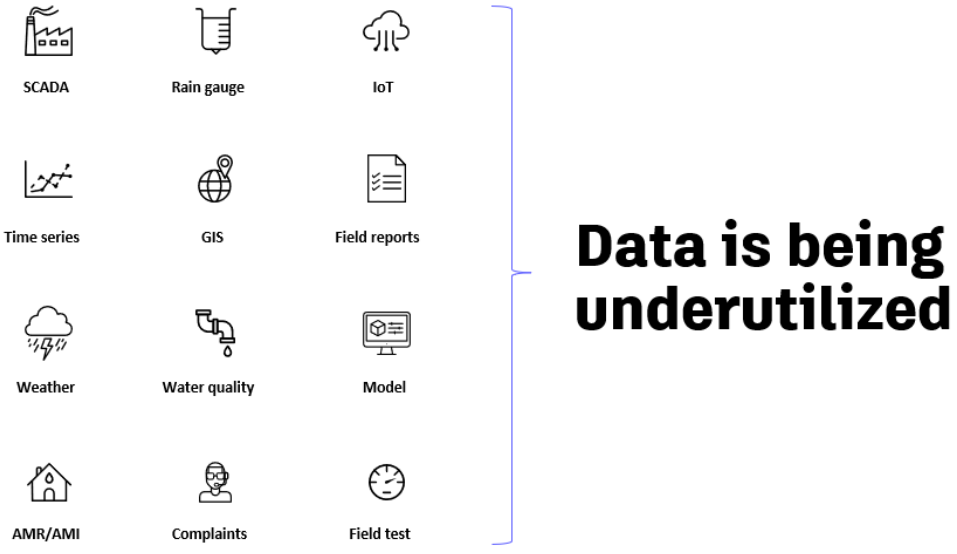
Modern and Emerging Challenges within the Water Industry

Data collection in the water industry is increasing exponentially. Not only does the industry have to address its legacy challenges - they also have the emerging and evolving challenges with the immense amount of data being collected – only increasing exponentially.

Utilities rely on a wide range of data sources to make important business decisions.

Depending on the stats you read from various industry sources, only around 5-20% of data being collected is being utilised for decision making purposes.

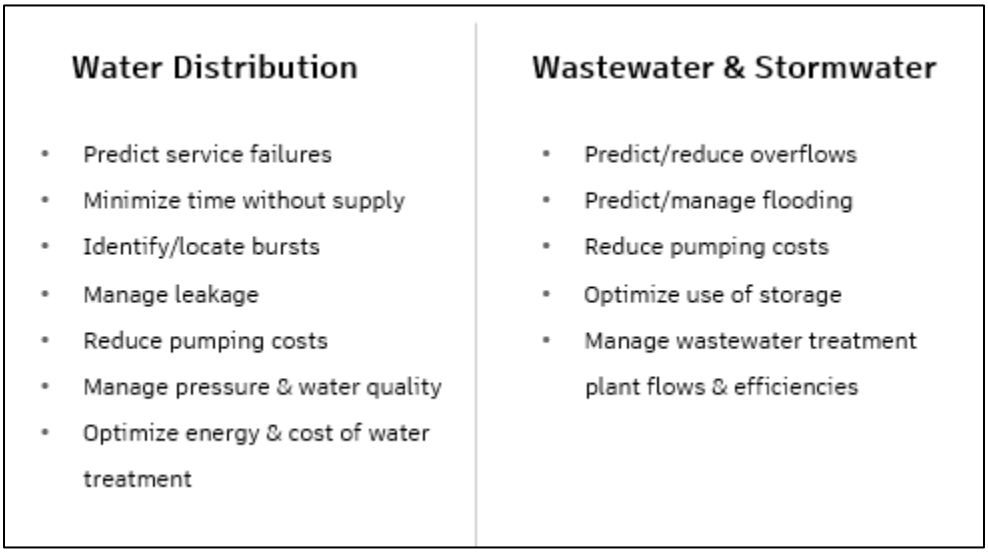
Industry research shows that about 20% of an engineer's time can be wasted looking for data or duplicating efforts.



Data collection is increasing exponentially, and utilities rely on a wide range of data sources to make business decisions.

The data being collected is where digital twins can now be enabled in operational use cases.

Digital Twin models are reaching the point where they can be deployed even in operational use cases – where accuracy, timing and speed matters.



Operational use cases where operational digital twins can improve outcomes.

From a digital twin perspective, AI/ML models love data.

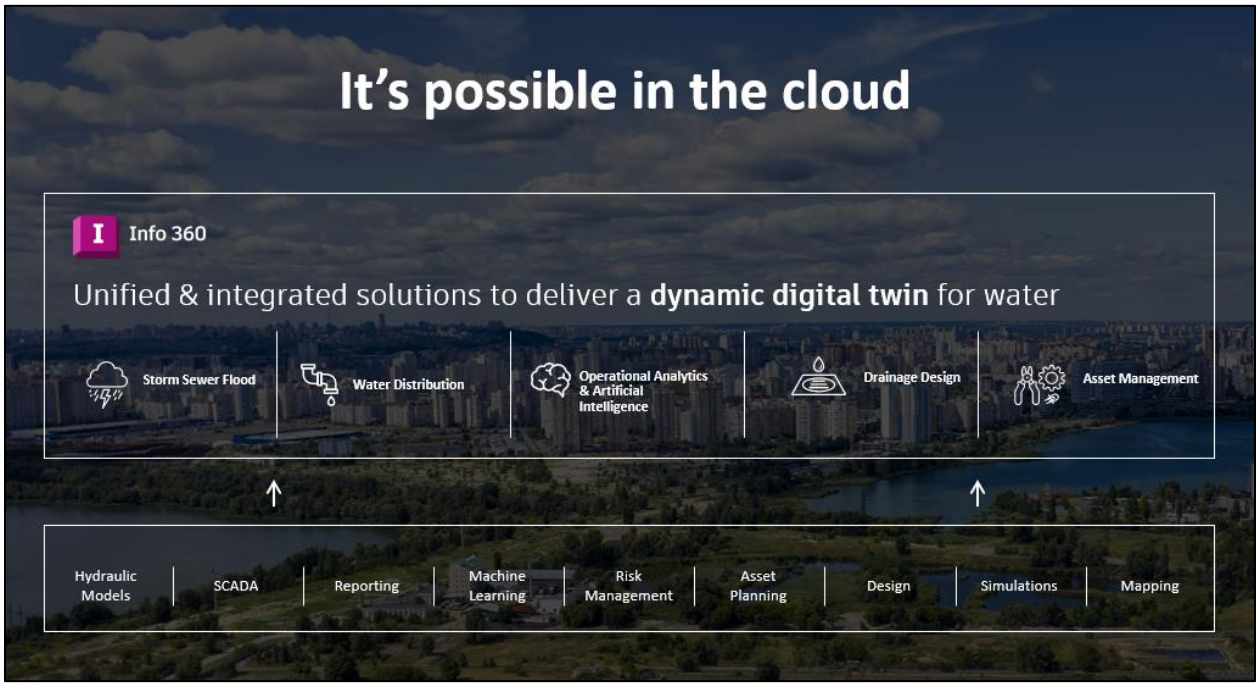
- Raw data, software systems and workflows must be combined to maximize the effectiveness of your onsite, operations and management teams
- Autodesk with Innovyze has built a platform with workflows that give you your attention and focus back.
- There's only so many trained mathematicians and data scientists in the industry, now any role and skillset can benefit from plotting a data stream, cross reference with a location of interest, in the context of their role within a workspace individually or collectively relevant to them.

Info360 – A Cloud Platform to Deliver a Dynamic Digital Twin to Water Industry

Autodesk with Innovyze has built out a cloud platform to address these legacy and evolving modern water industry challenges.

Info360 cloud solutions offer a pathway for utilities on their digital twin and transformation initiatives, giving teams workflows they need to operate, maintain, and optimize your assets across the water lifecycle.

Customers can gain the benefit of collaborating across their whole organisation with bi-directional workflows to support capabilities around compliance reporting, performance management and monitoring, workforce onboarding and training, and data standardization.



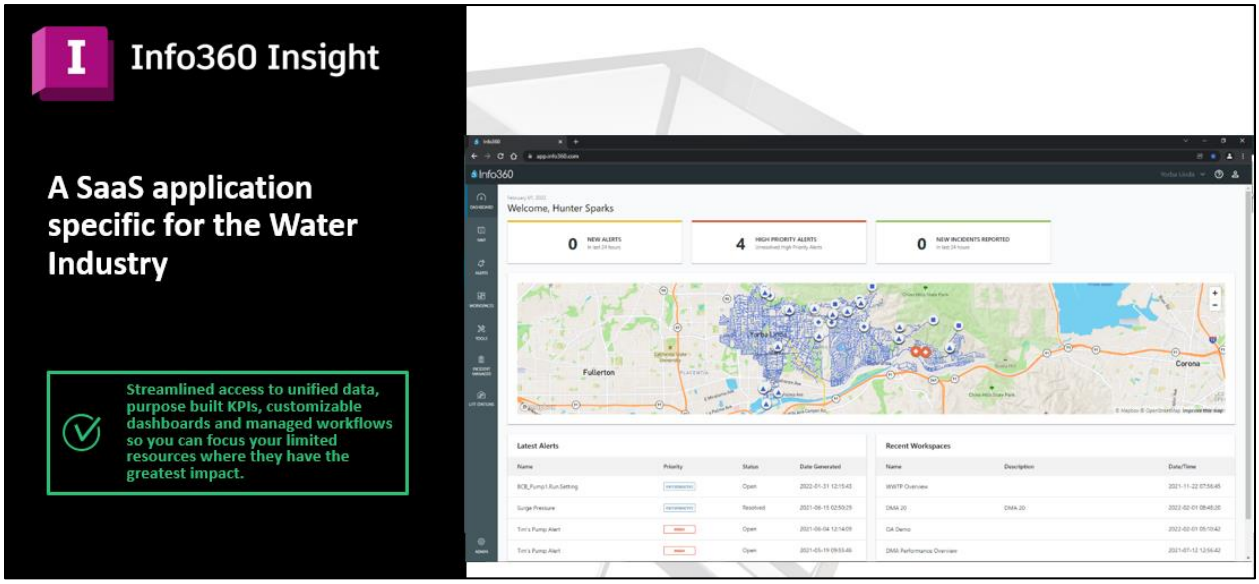
Data collection is increasing exponentially, and utilities rely on a wide range of data sources to make business decision – Info360 was built to offer a pathway for utilities to digitally transform.

Autodesk's Info360 cloud platform solutions offer a pathway for utilities to power digital twin and transformation initiatives giving your teams the tools with end-to-end workflows they need to operate, maintain, and optimize your assets across the complete water lifecycle without the burden of complex IT support and investment allowing you to make an impact on the communities you serve.

Info360 Insight: Operational Intelligence for Water and Wastewater Utilities

Info360 insight is a cloud-based operational analytics solution that allows water and wastewater utilities to understand operational performance with business intelligence, quickly respond to network incidences, check multiple resolution scenarios, and apply recommended actions to rapidly resolve system failures.

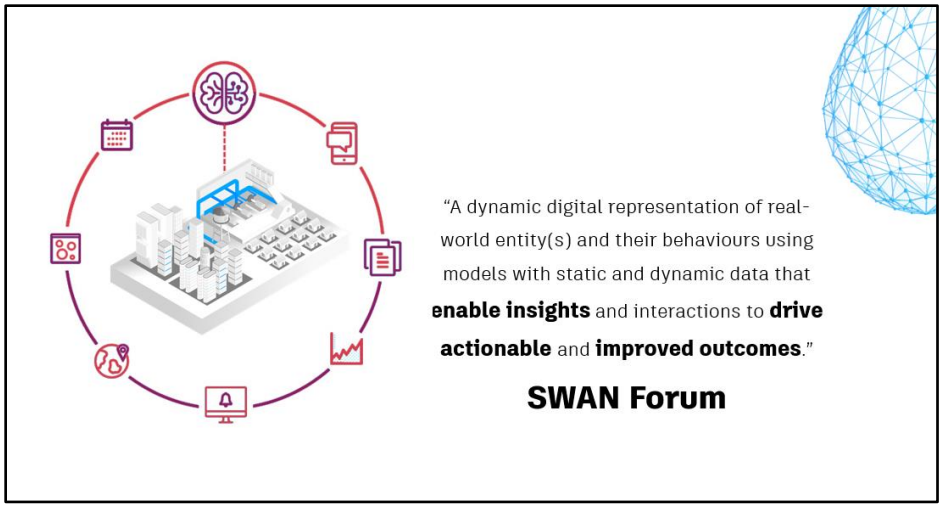
- Purpose built KPIs & custom analytics to minimize energy costs, water loss & leakage.
- Unified incident dashboards for easy handoff between operators and at-a-glance view for all stakeholders
- Identify customer impact and severity of an incident.
- Effectively communicate with customers and field crews during an incident event.
- 24/7 event monitoring and alerts of system anomalies
- Use simulation tools to scenario plan
- Manage customer complaints, site investigations, sensor alarms, operator notes, and other data points associated to an incident in a single view.
- Deploy crews with precision and confidence.



Info360 Insight – An operational analytics SaaS solution designed for the water industry

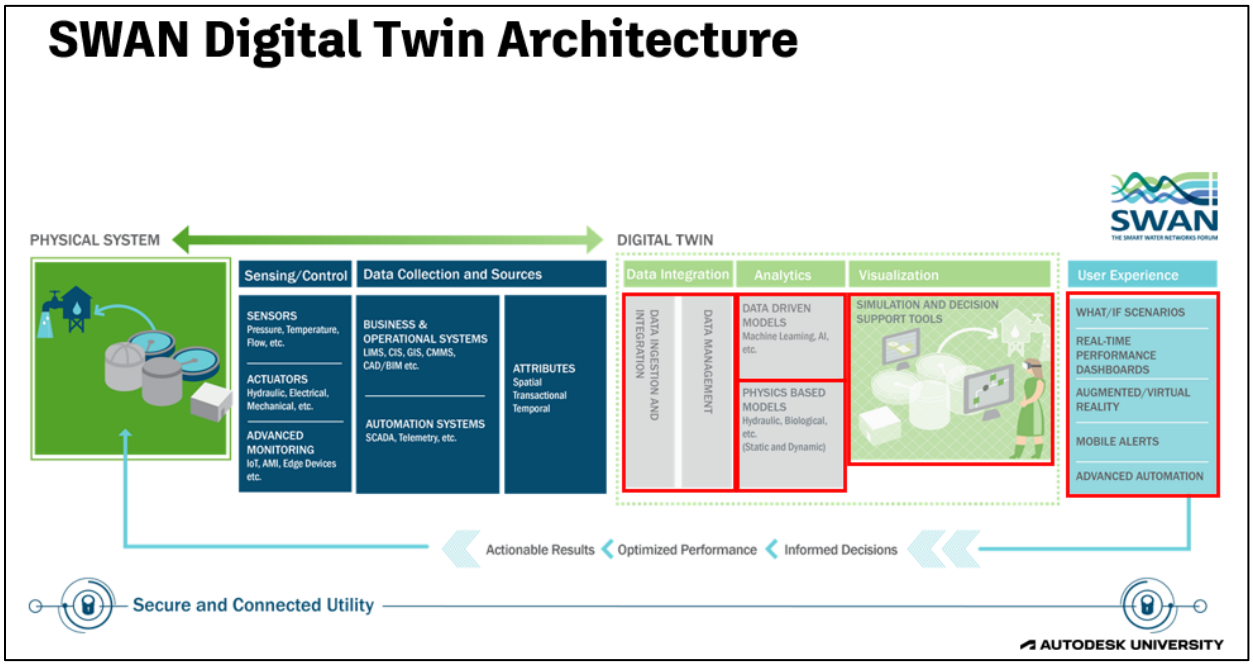
The Past, Present & Future State of Networks & Plants with Digital Twins

The past, the present and future conditions at the level of the asset can now be applied with digital twins to solve key problems and meet objectives for a given water network. Referring to SWAN Forum's (Smart Water Network Forum – swan-forum.com) industry definition, a digital twin of a water network or plant, in short is a virtual replica of a physical asset, updated in real-time via two-way data connection to represent the live characteristics of a network or plant.



SWAN Forum's (swan-forum.com) definition of digital twins is a common framework for use within the Water Industry.

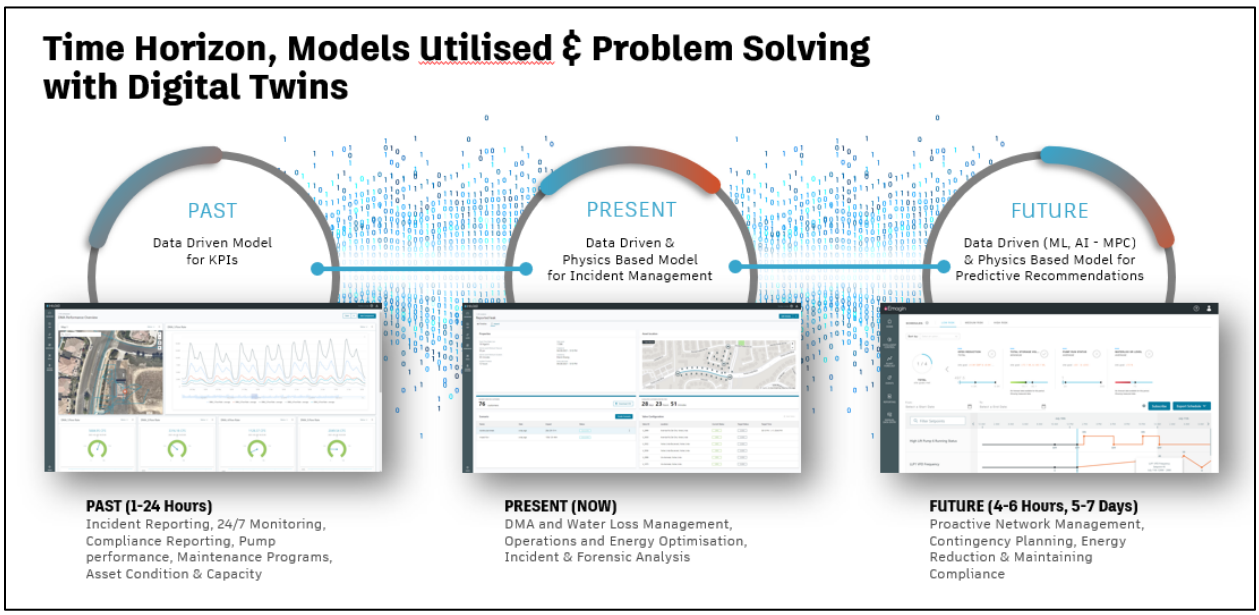
Trust in these systems has reached a point where predictive alerts actively support predictive responses to planned and emerging incidents with "What-if" scenarios, and even inform the operation of networks with real-time AI recommendations. From data integration, analytics, visualisation through to the user's interaction with the digital twin, data driven, and physics-based models compose the analytics layer as outlined by SWAN's Digital Twin Architecture, shown in the following figure.



SWAN Digital Twin Architecture incorporating aspects of Data Integration, Analytics, Visualisation and User Experience.

Time Horizons for Problem Solving

To articulate how best to align the core concepts of Digital Twins is to contemplate the time horizon in which you're solving your problem and relate to the actual problem/objective you're looking out to solve.



Models utilized within digital twins to solve problems associated with respective time horizon (past, present, and future state of asset)

Data Driven Models can be anything from applying a simple variance function to determine a threshold exceedance on a single sensor and progress through to predictive AI where AI provides recommendations in how operators should run a given asset.

Now, the question here is IF AI is so advanced or has so much potential, then why would you use a hydraulic model that simulates based on the physics of the system?

Essentially, sensors are not available in all parts of a network and a live physics-based model allows you to test operational changes before you implement them in your network.

Info360 now enables these model types to share workflows where they are used to supplement each other and to mitigate those tradeoffs.

Combinations of data driven and physics based models are being used within cohesive workflows that have been enabled through platform advancements via cloud computing for increased scalability, deploying against previously unavailable computing resources.

Mitigating trade-offs between model types; physics-based models and data driven models are ever more an 'AND' proposition instead of solely an 'OR'.

The Past – Historical Data & Analysis

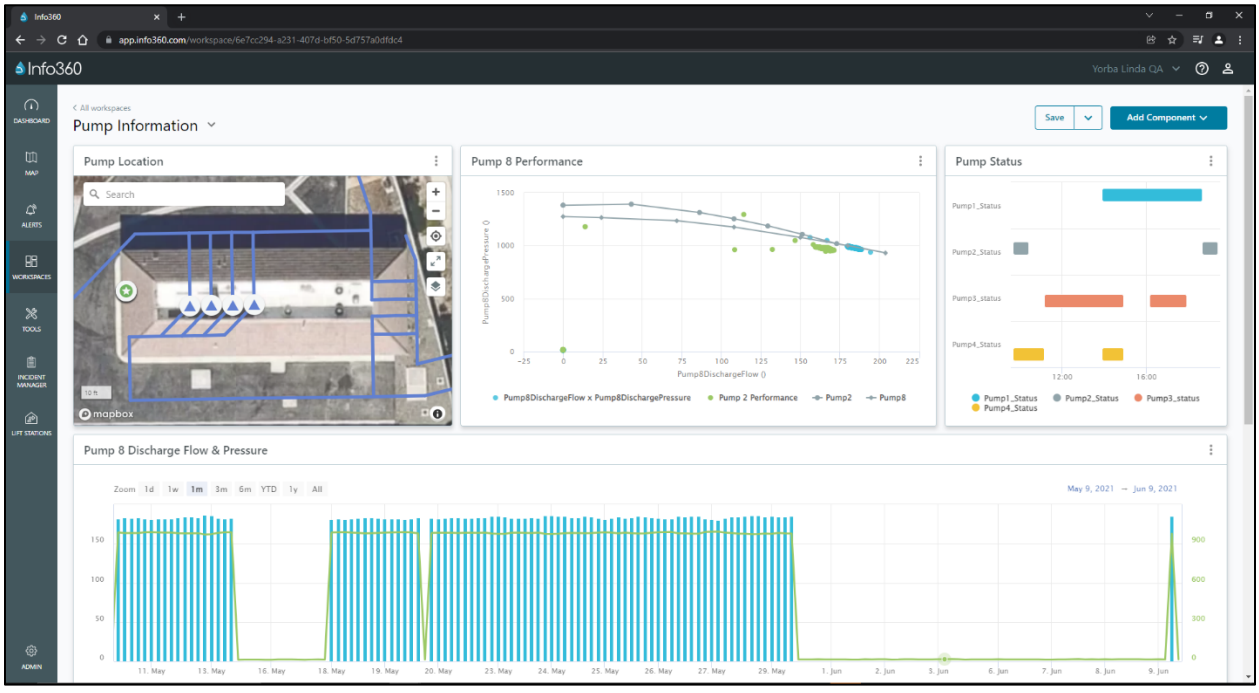
Wellington Water with Stantec Digitizes Preventative Asset Maintenance

As part of its digital pump monitoring study for preventative asset maintenance, Stantec utilised Info360 Insight, an operational analytics application for their work on continuous monitoring and analytics on pump performance over time. Info360 Insight being a data modelling application with workspaces open to the end user's expertise and unique data needs to inform operational and network performance decision making.

Stantec chose Info360 Insight to help Wellington Water develop a preventative asset maintenance program. Using Info360 Insight, the utility could maximize its large storehouse of raw SCADA data to better understand its operational performance.

Stantec saw value in using Info360 Insight to reduce performance failures and improve efficiency. Instead of sharing raw SCADA data, Wellington Water could feed the data into a solution that included analytics and modeling, capital planning, asset management, and operational performance. The utility could share the water performance data across teams such operations, planning, modelling, and asset management.

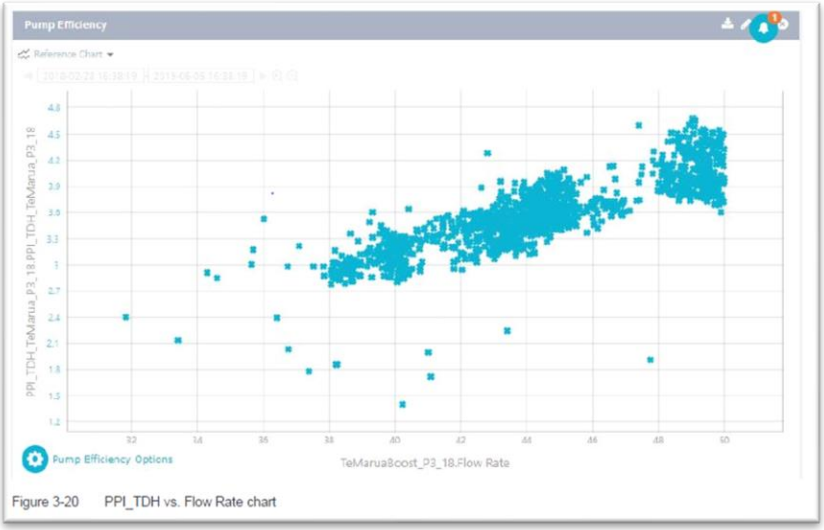
"By using their own data, they could have more control over the results, and the utility could be more transparent," James Curtis of Stantec. And instead of dozens of easily losable spreadsheets or paper reports, Wellington Water engineers and operations managers could view the same data in the same dashboards.



Purpose built pump performance workspace within Info360 Insight with analytics and visualisations.

Stantec planned out Wellington Water's preventive asset maintenance program to:

- Establish real-time direct connections to incoming data instead of manual downloads.
- Standardize internal pump performance calculations.
- Expand pump performance analysis to include seasonality considerations.
- Provide scalability to extend templated project calculations to remaining sections of the water infrastructure network for future analysis and project work.



Scatterplot of pump efficiency vs flow rate as calculated within Info360 by Stantec.

The Stantec solution with Info360 incorporated four phases:

Sourcing and configuring data capture. Gap analysis on the instrumentation and telemetry available for each pump. Pumps are then prioritized for monitoring based on energy use and criticality. Info360 Insight automates data collection and integrates data from multiple data sources.

Establishing pump performance metrics. Typical metrics would include preferred operating, outage, high variation in pump hours, and catchment growth.

Analyzing for operational insights. Info360 Insight dashboards display the performance metrics derived from telemetry and field test data.

Using insights for action. Typical actions might be pump overhaul timing based on actual condition and would preferentially operate the most-efficient pump combinations and speeds.

Outcomes:

Using the Stantec solution built on Info360 Insight, Wellington Water has seen an **estimated 20% savings in electricity costs.** In addition, the utility is saving costs associated with doing maintenance only when it's needed, and the reduction of field tests needed to assess pump condition.

As the utility adopted proactive maintenance for pumps, it also improved operational resilience. Detection of failing pumps or other performance issues occurs before the problem impacts service to customers. Measuring the potential for functional failure from performance deterioration allows the water utility to proactively intervene with pump refurbishment or renewal.

As James Curtis of Stantec explains, the benefits of proactive asset maintenance go beyond lower electric bills. “Energy savings translate to reduced carbon emissions,” he says. “Plus, engineers gain knowledge around pump system performance. And they have a high potential for detecting red-flag pump problems before there’s loss of performance.”

The Present – Event Detection & Rapid Response

Transitioning to Operational models with the next use case, where we can perform present ‘what-if’ scenarios hydraulic analysis at the level of the asset.

Water Corporation Deployment & Implementation of Smart Water Network (SWN)

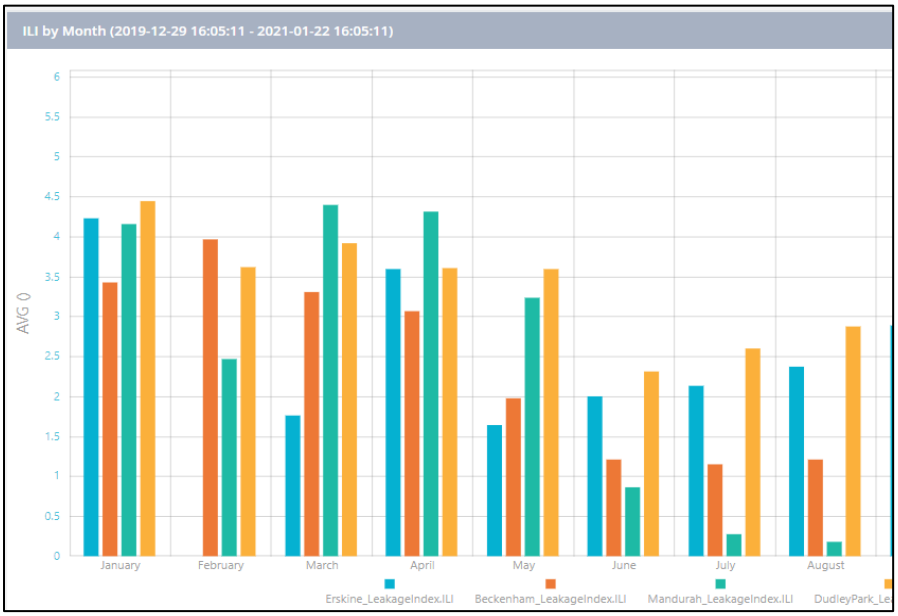
About Water Corporation:
- Second largest water utility in Australia
- Manage 52,122 kms of water & sewer pipes
- 82 + 113 water and wastewater treatment plants
- 1.3M homes and business served (2.3M Customers)

Corporate objectives (Project Background):
“The Perth Integrated Water Supply Scheme (IWSS) network assets are relatively young by international standards; however, they are starting to deteriorate, and Water Corporation is interested in proactive approaches to managing pressure and flow across networks to reduce the frequency of leaks and bursts, reduce water loss, customer interruptions and the potential for extending asset life.”

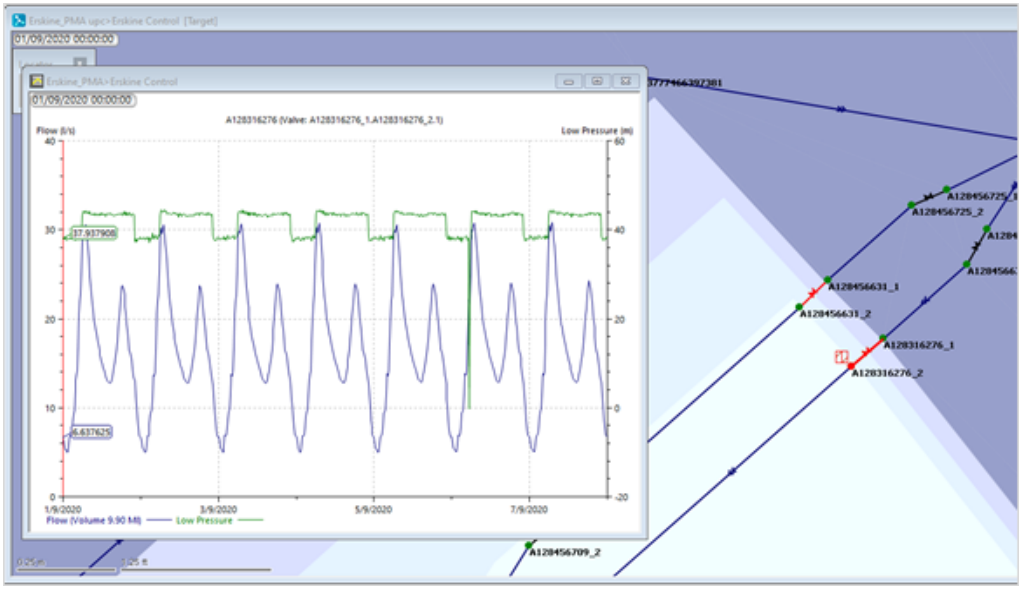
About the project:
- Use of Smart Water Technologies (SWN) via Water Research Foundation (WRF)
- Digital twin combining **data-driven** model (Info360) & **physics-based** model (IWLive)
- We deployed a platform that includes a performance dashboard and a live hydraulic model covering 4 large DMAs/PMAs.

The deployment and implementation of a digital twin solution coupling data driven (Info360 Insight) and physics based operational models (IWLive) for optimised results and actionable decisions around key identified challenges as part of the project included: Aging infrastructure causing pipe breaks as age related issues have been identified as on the rise, proactive management for reduction of water loss with a NRW target of 10% for 2030, consistently and consciously manage pressure transients and extreme pressure events with age related degradation of the network occurs, reduce data overload of multiple data acquisition tools and system via improved data organisation and consistency and address the dynamic between human knowledge of the network and what can be stored and accentuated within the digital twin.

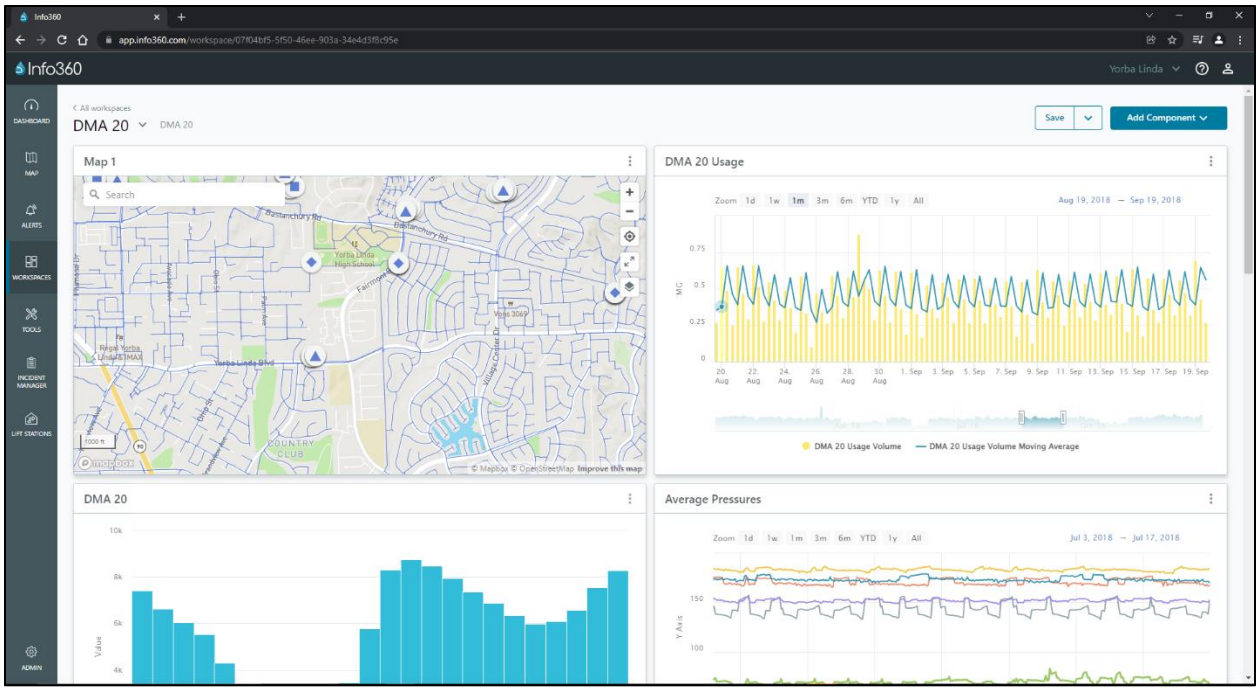
The implementation has seen successful user interactions with the software's outputs utilising a real-time and predictive continuous map view of water network (flows, pressures, tanks levels, pumps, PRVs, PMAs/DMAs, etc), simulating "what-if" interventions and user-built workspaces with alerts based on demand predictions from machine learning model and KPIs (i.e., infrastructure leakage index ILI).



The dashboard within Info360 effectively queries telemetry data to determine and rank leakage performance based on DMA for NRW target of 10%.



Demand forecasts within IWLive for the next 24-48 hours are fully integrated with the live hydraulics and SCADA data for predictive modelling of incident management interventions.



Workspaces within Info360 Insight allow for NRW and leakage metrics to be accessible and analyzed.

Info360 Insight – A Workflow for Rapid & Optimal Resolution of Incidents

Water utilities and councils don't have visibility where they don't have sensors, furthermore they can't derive optimal action plans and outcomes from measured sensor data alone.

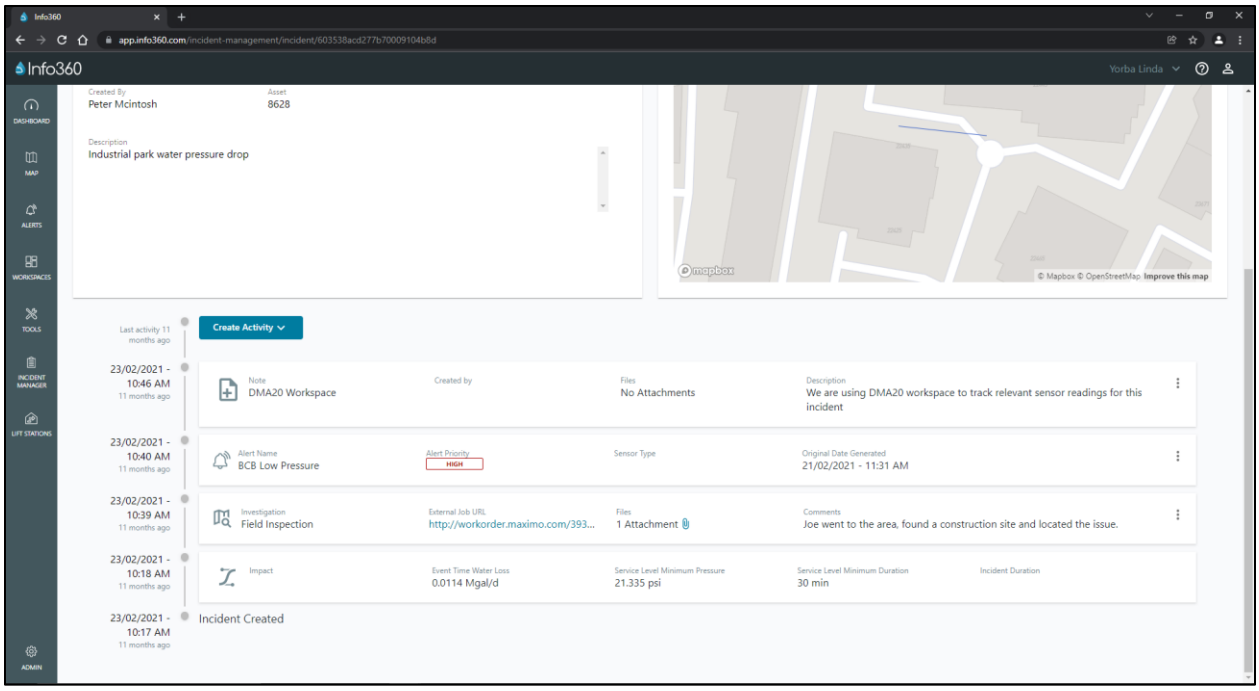
An Operational Digital Twin deploys both advanced data analytics and physics-based models tie together analytics and modeling -- connecting planning, operations, field crews, management, and executive teams across your organization.

The incident management tool within Info360 Insight provides:

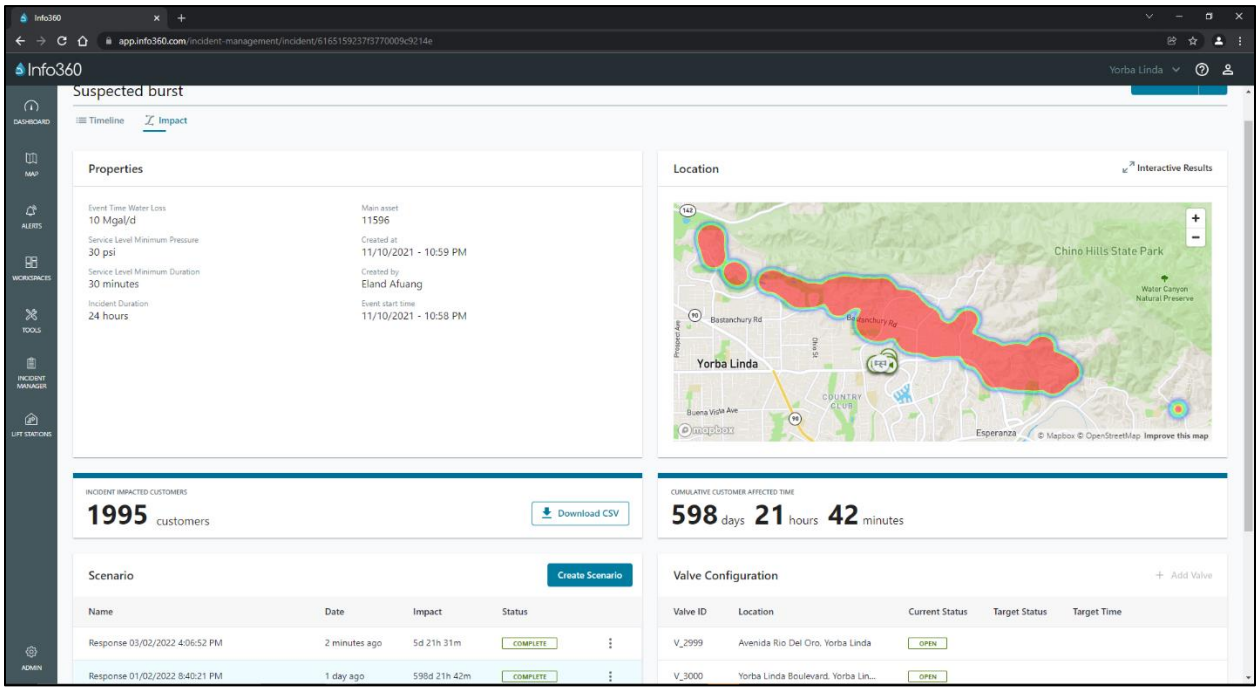
- Timeline view shows all activities associated with resolving an incident
- Incident impact heat maps show time-dependent impacts of isolation scenarios

With a common operating picture, an incident timeline view to:

- Identify in context
- Create and update
- Monitor and simulate
- Deploy crews with precision
- Resolve with least impact



Timeline view of activities associated with identifying and resolving incidents within a network.

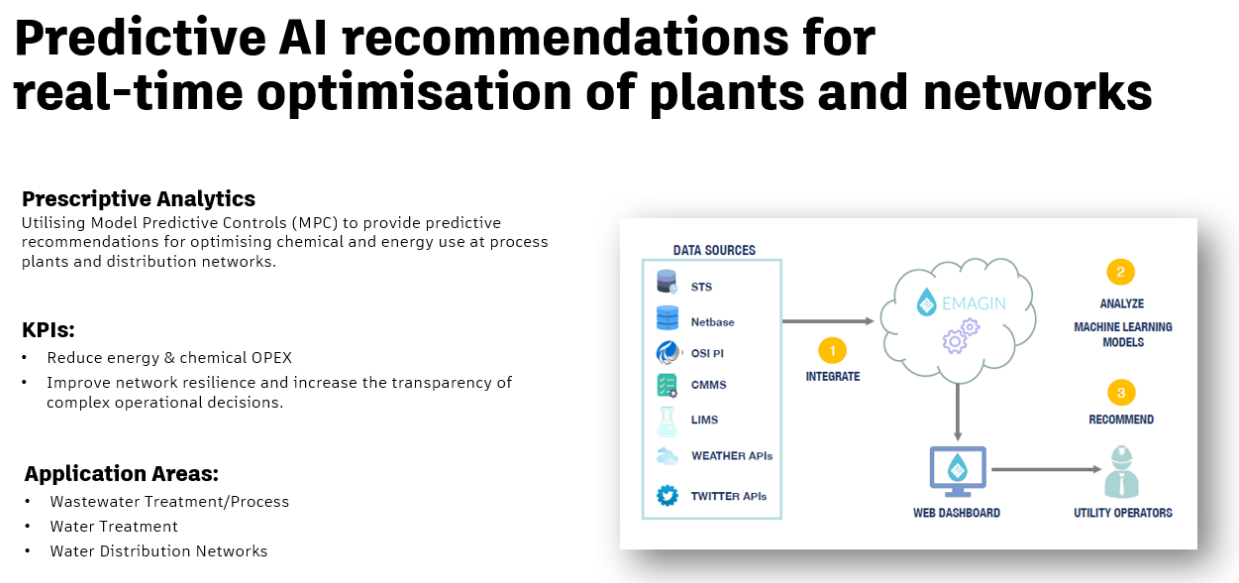


Timeline view of activities associated with identifying and resolving incidents within a network.

The Future – Predictive Recommendations with AI to Optimize

Reducing Energy Requirements by Improving Sludge Quality with AI

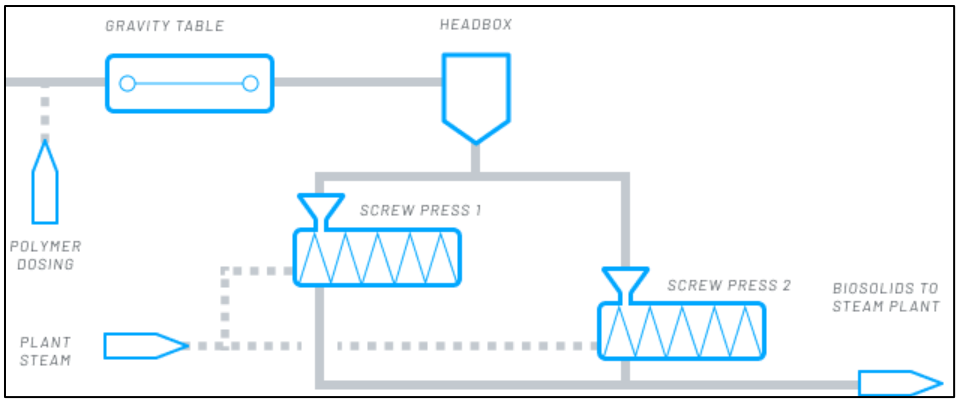
In general, Info360's AI can abstract out any process schematic (water, wastewater networks and treatment plants) into a real-time predictive model that accounts for changes to various operating conditions.



Overview of applications and KPIs associated with AI predictive recommendations.

Use case example: Digital twin implementation of solids dewatering process at a wastewater treatment facility. The sludge treatment facility cleans 11 MGD of wastewater and discharges into a receiving waterway. Sludge treatment consists of thickening, digestion, and dewatering. The project's goal was to reduce the cost of treatment of solids per dry ton.

The facilities are subject to variable tariff structures (day, night, weekday, weekends) and onsite energy production. The facility operates to maintain sufficient product to be utilised as fuel in power generation at the facility, while maintaining adequate digestion period. Machine learning models were developed based upon historical data from various data sources like total solids sensors, flow monitors, water quality sensors, and chemical control feed pumps; real-time operational decisions were made and improved upon using machine learning.



Overview of applications and KPIs associated with AI predictive recommendations.

Initially, polymer dosing optimization was achieved with machine learning (ML) to prescribe the best dosing points and sludge feed rate to reduce overall polymer use. An optimal approach was developed to increase chemical use to develop fuel to offset energy costs. Soft sensing technologies were implemented; effluent total solids, energy consumption and production, and total wet solids weight were monitored in real time.

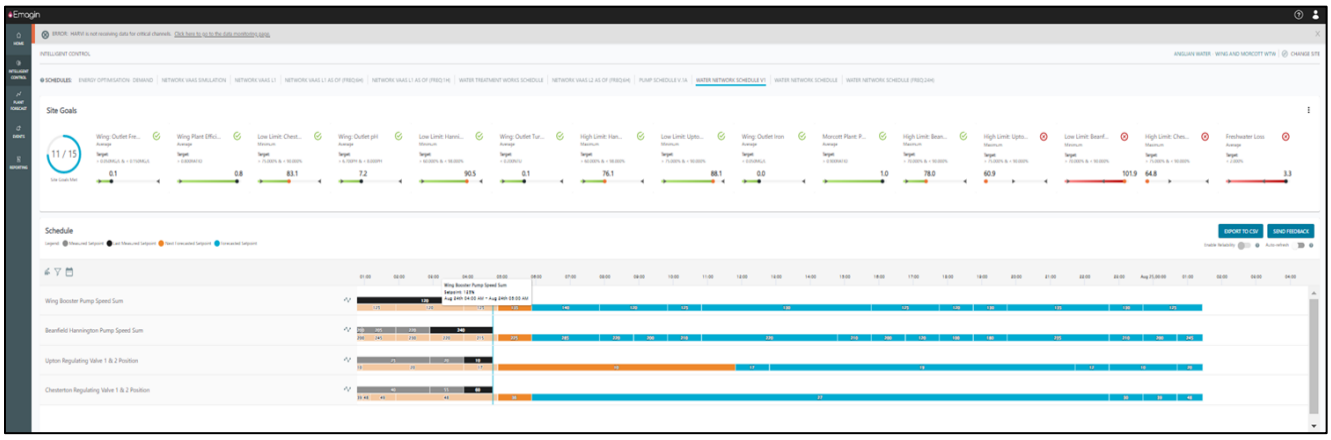
Key Performance Indicator	Historical Operations (Annual)	AI Optimized Operations (Annual)	AI Savings Annual
Polymer Ratio Avg	0.019	0.018	0.001
Sludge Dryness Avg (%TS)	33.42%	36.64%	3.22%
Polymer OPEX ($)	$230,592	$218,456/yr	$12,136
Oil OPEX ($)	20674.64Bbl $1,137,105.20	18857.71 Bbl $1,037,174.05	1816.93 Bbl $99,931.15
TOTAL OPEX SAVINGS FROM DRYNESS OPTIMIZATION ($)			**$112,067.15**

Empowering their team, the facility operators were able to reduce their overall operating costs by 8-15% compared to the year prior. Benefits still to be measured include knowledge transfer, operational efficiencies such as staff scheduling and collaboration.

How the user interacts with predictive recommendations

Predictive recommendations in real-time for optimal control setpoint changes are visible on the dashboard. So the operators, receive recommended control schedules to run a given setpoint for a particular asset.

Referring to the image here, the **black lines** are the current operating setpoints and the **orange** and **blue lines** are the advised setpoints for the future state of the system.



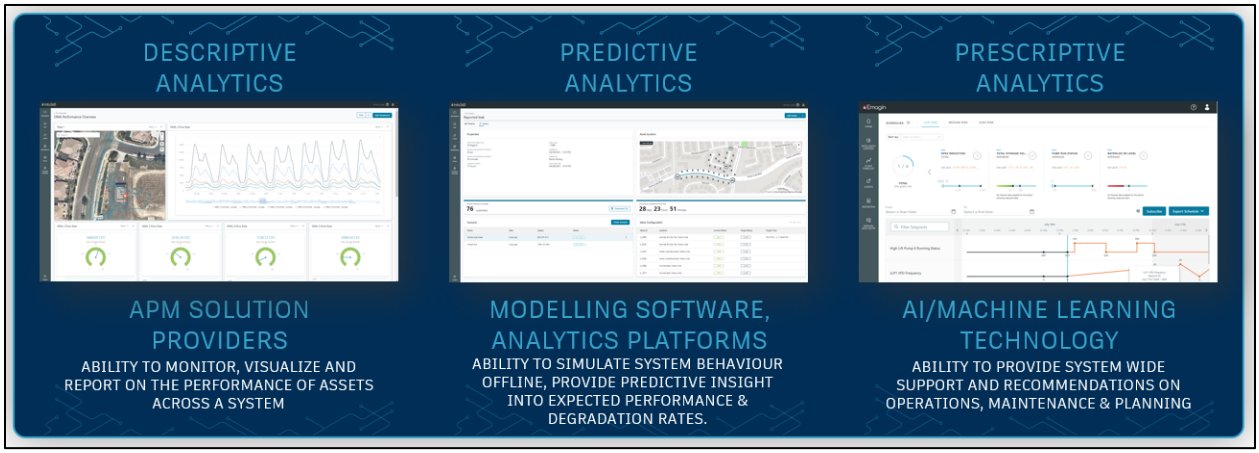
Site goals, current operational setpoints and advised setpoints based on future state of system.

Digital Twin Maturity – A Journey Within a Platform

A Path to Optimization

Descriptive, predictive, and prescriptive digital twin solutions have been emerging in the water industry as crucial components to describe digital twin maturity and sophistication levels as progression and realization of technological advancements within the space continue to occur globally. Prescriptive solutions that answer "what should happen" with an optimal recommendation to control a given network and treatment plant asset may feel and be perceived as out of reach for many councils and utilities on their digital twin adoption journey.

There is a more critical need for optimal, proactive decision-making to combat the burdens of climate change, fast-evolving regulatory frameworks, market resistance to rate increases, and uncertainties posed by the anticipated retirement of highly experienced and skilled workforce talent.



Progressing across analytic types within the Info360 platform.

Descriptive and Diagnostic Analytics: Ability to monitor, visualize, and report on the performance of assets across a system. Transparency and data are the first steps towards implementing an eco-efficient system. Key ingredients to a robust descriptive analytics toolset:

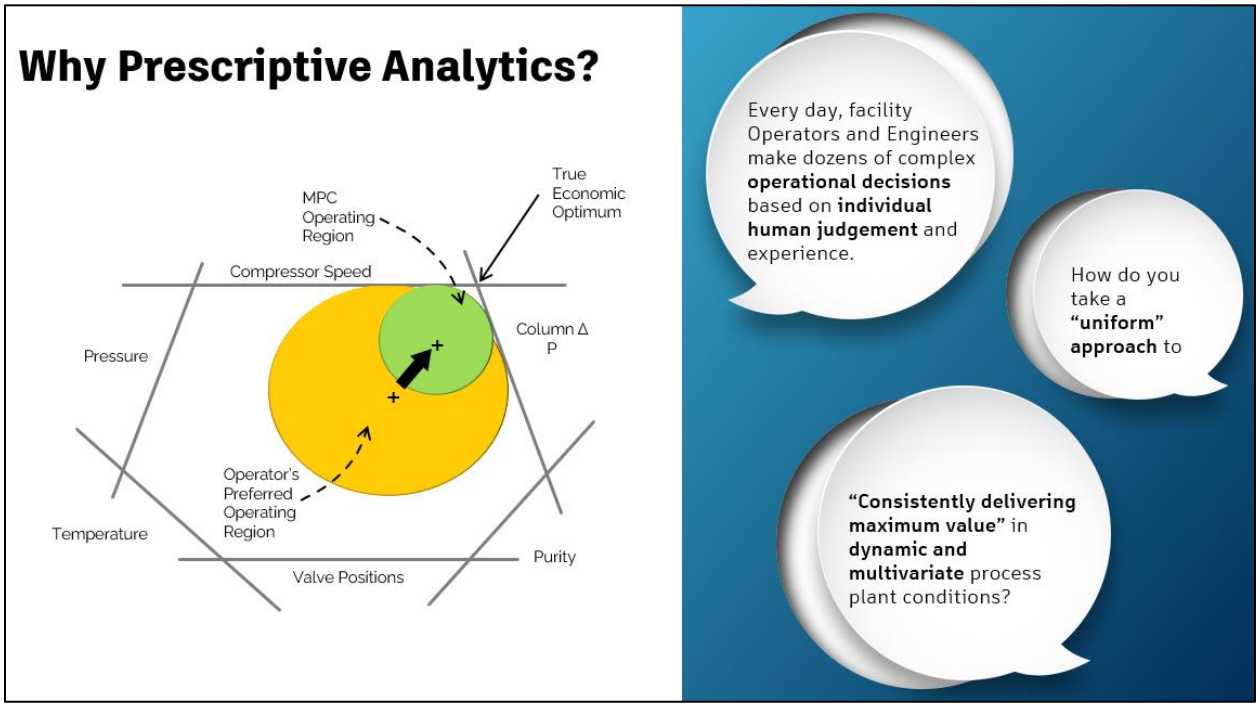
- Gather and unify asset information via data aggregator and storage (IoT, Historians, SCADA, LIMS,)
- Data visualization and analytics interface

Predictive Analytics: Ability to simulate system behavior offline, provide predictive insight into expected performance and degradation rates. Simulating energy, water, and waste mass balances allows users to determine rules to re-allocate, repair, and/or re-use system byproducts for more robust operations. Key ingredients to a robust predictive analytics toolset:

- Connect modeling, simulation, numerical analysis data within the data platform
- Control logic for selecting best toolsets to forecast future data
- Asset-based metadata

Prescriptive Analytics: Ability to provide system-wide support and recommendations on operations, maintenance, and planning to maintain operations within control limits. Key ingredients to a robust prescriptive analytics toolset:

- Decision workflow matrix (logic and process expertise)
- System boundary conditions (market price, available resources, asset remaining useful life)



The importance of prescriptive analytics in helping operators navigate complexity to optimal decisions.

AI helps plant operators take a uniform approach for optimum plant operations in always changing process plant conditions.

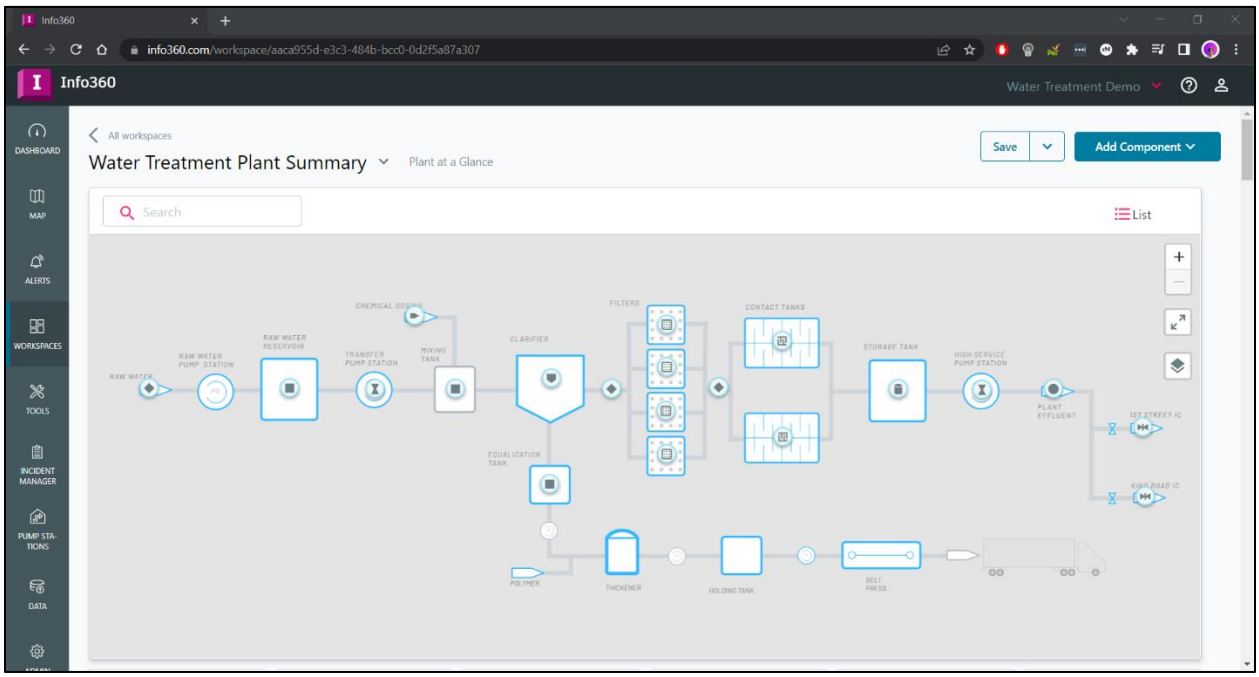
- Outside lines represent process constraints.
- Orange circle, the operator's comfortable region of operation.
- Green circle is where AI the advised operating range.
- Top right is the most economic operating point.
- Each operator has a different skill, experience, and way of operating the plant which may not be the optimum outcome for operating the plant.

Introducing: Info360 Plant

Autodesk is excited to announce, here at Autodesk University – the launch of Info360 Plant. The latest product within its Info360 Platform.

Info360 Plant is a cloud-based operational analytics solution for water and wastewater treatment plants to improve performance, compliance, and operational workflows.

Customers can gain the benefit of collaborating across their whole organisation with bi-directional workflows to support capabilities around compliance reporting, performance management and monitoring, workforce onboarding and training, and data standardization.



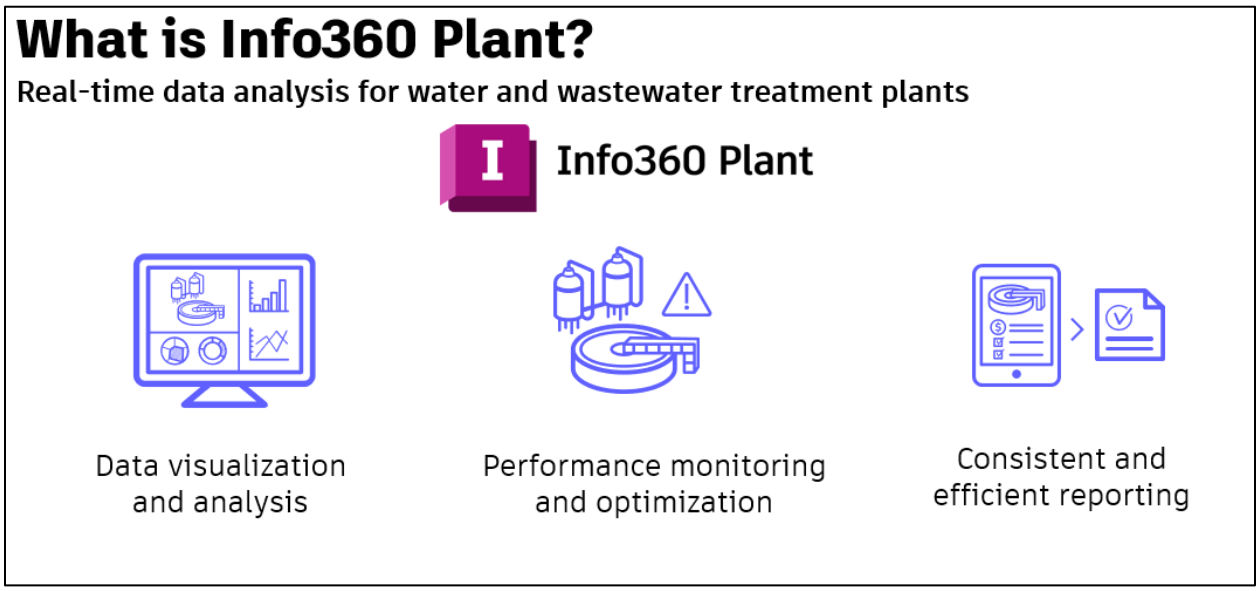
Process flow diagram, 'taggable' with live data feeds within Info360 Plant.

This tool enables workflows in three key areas: performance, compliance, and improvement planning.

- Generate one source of truth for all varying data sets and simplify user workflows for reduced complexity.
- Improve operational efficiency with data-backed insights to your plant performance.
- Save time and effort by automating reporting for regulatory agencies, key stakeholders, and sustainability initiatives.

Info360 Plant – A Solution within Info360

- Interoperability with Info360 Insight | Info360 Asset
- Pathway to optimizing with Artificial Intelligence. Info360 Plant allows for value from day implementation, allows initial data collection so that data and use cases can be assessed in time for optimization scenarios and overall readiness.



Key benefits of Info360 Plant

What can I do with Info360 Plant?

Product capabilities and supported workflows

Capabilities	Custom water analytics	Cost management	Performance tracking	Compliance reporting	Training & knowledge retention	Incident Management
Workflows	• Connect various data sources • Generate ongoing custom calculations • Create personalized visualizations	• Energy cost tracking • Chemical cost monitoring and optimization • Downtime cost calculations	• Pump analysis tools • Bioreactor analytics • Coagulation / flocculation efficiency • Daily reports	• Configurable monthly reports • Simplified data export features • Custom alert criteria • Issue Management	• View past events and outcomes • Record on-going best practices in workspaces • Generate facility summary	• Custom alerts • Process engineer creates workspace • Workspace gets used to track and gain insights from stakeholders
Unified data	Historian | Laboratory | Weather | Cost Items | Process & Instrumentation Diagrams | Photos | Field Data					
Insight	Dashboards · Reports · Data Connector · Performance Benchmarks					
Admin	Facilities Management· User Management Editor Viewer· Account Admin · Data Federation					

Key capabilities of Info360 Plant

Why do I need Info360 Plant?

Reduce process and workflow complexity

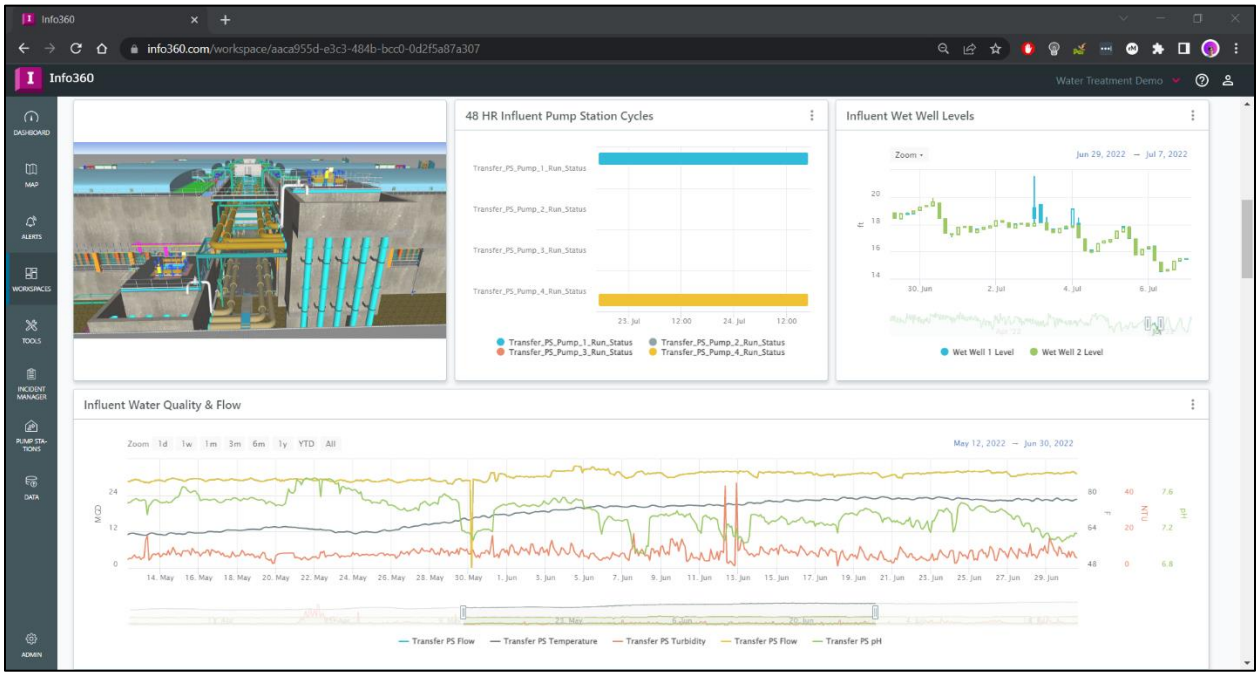
- Onboarding and training
- Simplifying asset/process relationship
- Streamlined workflows, directly connected to live/disparate data sources

Improve performance and level of service

- Chemical dosing
- Energy use
- Improve water quality

Automate reporting processes and easily generate status and compliance reports

- Reduce hours spent finding, organizing, and cleaning data
- Generate consistent status and compliance reports



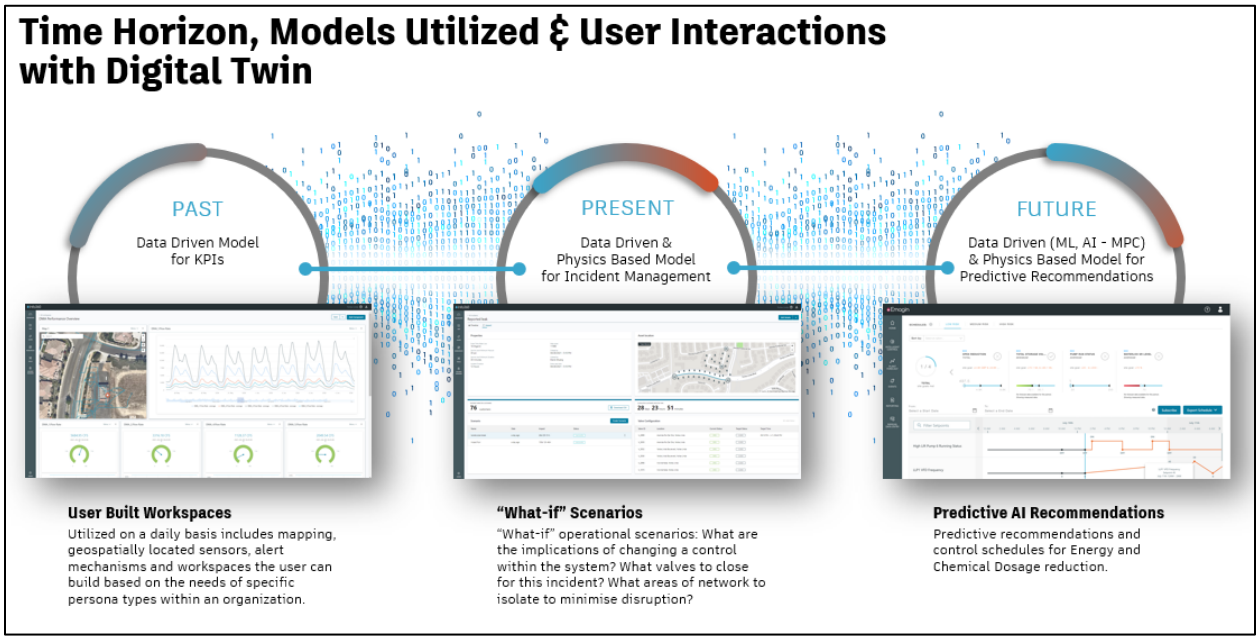
Personalized workspaces designed to be used on a daily basis for unique individual and team needs.

Digital Twin Adoption

Time Horizon, Models Utilized & User Interactions with Digital Twins

Autodesk with Innovyze and Info360 has established **a** digital platform that integrates all these model types. Again, to align the core concepts of Digital Twins with the time horizons….

Here we see how the user interacts with the software relative to the combinations of models utilized.



How the user interacts with the software relative to the time horizon and model types utilized.

The Past (Historical data & state of your network): Informs the performance of the network using user-built workspaces with performance KPIs metrics.

The Present (present happenings) time horizon: Is used to generate alerts based on incidents occurring in the network which can be used to generate "what-if" scenarios & contingency responses.

The Future (forecast, predictions): Future setpoints are generated from the AI, predictive recommendations to the end user.

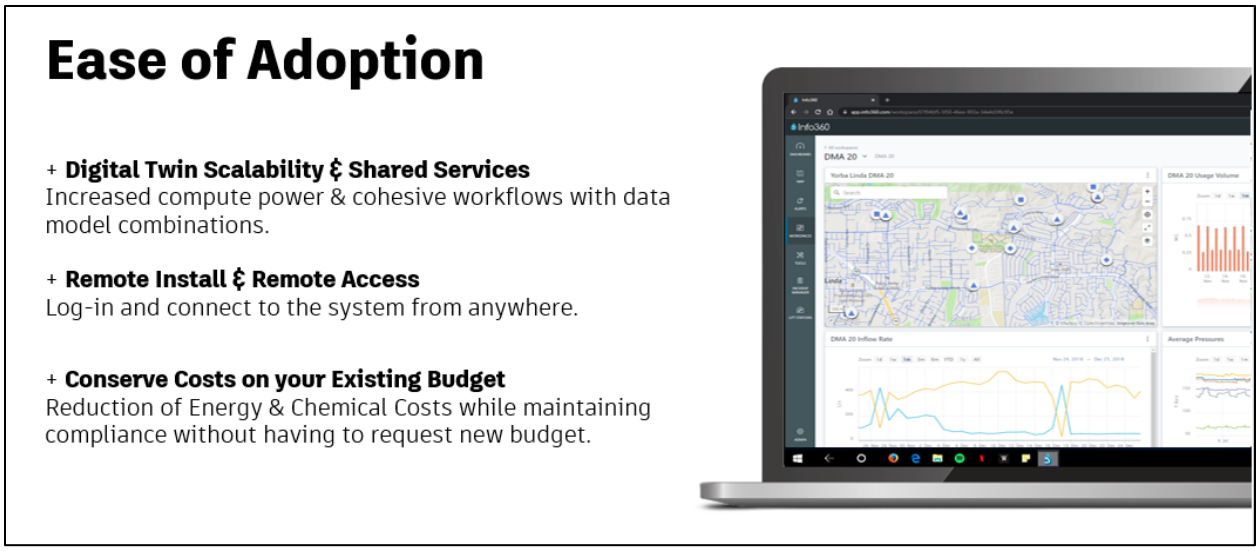
A Pathway to Digital Transformation

Autodesk's **Info360 cloud solutions** offer a pathway for utilities to power digital twin and transformation initiatives, giving your teams the tools with end-to-end workflows they need to **operate, maintain, and optimize your assets** across the complete water lifecycle.
Info360 cloud solutions are designed to work with Innovyze desktop solutions, as well as SCADA and IoT solutions, to drive better outcomes and gain value from your IT investments.

Info360 Insight, Info360 Plant and Info360 Asset are the first solutions available on the Info360 platform.

Convergence of enabling Digital Twin technology adoption:

- Cloud based solution with microservice architecture without the burden of complex IT support and investments
- Benefits:
  - Scalable and Elastic – you can simply add more data and processing capacity based on your use case needs
  - Technologies like AMI and IoT already pushing data across the cloud
  - Easier integration across business areas (billing, work management, planning)
  - Accessibility – mobile or remote operations teams
  - Cloud allows capabilities like:
    - Machine Learning
    - Scaling out simulations
    - Monte Carlo analysis



Factors influencing why Info360 is accelerating the adoption of digital twins within the water industry.

In getting started – build from what you're already doing….

- Individual models can be accessed from the platform for the problem you're working on.
- Focus on the problem you're solving. You can actually start with a simple use case.
- Understand how the users will interact with the Digital Twin on a daily basis.
- Workflows exist to serve Operations and their rapid decision-making needs through to high level decision making by Executive Management.
- Use cases beyond engineering teams with workflows accessible to a wider group, wider range of personas within a utility and council.

Innovation & adoption is accelerating from a pure capability standpoint but also, emerging remote working team formations and globally connected environments.

Really all one needs now is a **Login. So, get started!**

Product Center Links:

Info360 Insight: https://www.autodesk.com/products/info360-insight/overview

Info360 Plant: https://www.autodesk.com/products/info360-plant/overview

Info360 Asset: https://www.autodesk.com/products/info360-asset/overview