

X-ACT

FOR WATER UTILITIES

X-ACT provides problem-solving value across diverse water utility use cases including optimization, risk management and planning exercises

OVERVIEW

Water utilities are facing extraordinary challenges and unknown risks caused by aging infrastructure, changing weather patterns and regulatory pressures. Due to computational challenges, simulation tools cannot always provide the answers utilities need to efficiently operate, maintain and refurbish water networks.

- Utilities use X-ACT® to prevent problems, optimize operations and plan for the future
- X-ACT creates a digital twin that replicates the dynamic behaviors of physical network assets, systems and processes
- Users can analyze current or future scenarios that would be too complex, expensive or even impossible to test using traditional simulation tools

With an end-to-end understanding of the complex factors that drive costs, efficiency and performance, grid operators can gain confidence in decisions, maintain better control of risk and find opportunities for improvement.

DIGITAL TWIN

Every business is unique, but most water networks and underlying processes are built using common building blocks.

- X-ACT libraries include over 10,000 pre-certified modeling components that speed model construction and accelerate to time value
- Modelers use common utility and IT configurations from X-ACT libraries to build a digital twin
- Then, using limited data sets, modelers can easily customize and verify that the digital twin produces the same results as its physical counterpart

KEY FEATURES & BENEFITS



END-TO-END MODEL

Industry's only digital twin that covers all cross domain dynamic interdependencies—including business processes, network segments and technology—in a single model.



ACCURATE PREDICTION/PREVENTION

No iterations required to obtain highly accurate what-if predictions. Clear metrics identify risks and opportunities for improvement across all areas of the business, water network and IT.



COMPUTATIONALLY EFFICIENT

Size of models are not restricted by compute power or storage space. A twin covering tens of thousands of components can compute within minutes.



KPI METRIC TRACKING

Sophisticated, yet easy to decipher metrics show whether current or future network states will achieve the right balance between key metrics like cost, pressure, capacity and water quality.



FAST ROI

Delivers value within months by offering a library of 10,000+ modeling components that capture common utility configurations and can be easily customized using limited data sets.

Unlike static or iterative modeling approaches, X-ACT uses advanced algorithms to concurrently analyze time dependent relationships between tens of thousands of infrastructure components, technologies and related processes in a single model.



This avoids segmentation requirements, drastically reduces time spent on model construction and helps users find answers to more complex questions. For example, “What will happen if water temperatures in pipes exceeds 25°C?” “Which control measures will effectively manage the risk of water contamination?” And, “How can we meet government climate protection targets without passing significant costs on to customers?”

SCENARIO ANALYSIS

Through what-if scenario analysis, X-ACT clearly identifies issues that may be impacting the cost-effectiveness, capacity or reliability of water services.

To expose risks or plan for the future, X-ACT automatically calculates future model states. This makes it easy for users to change parameters—such as water load and pressure, equipment functioning, sensor placement, temperature or age of components—to find scenarios that cause problems or improvements.

Using the remedial recommendations provided by X-ACT, users can create optimization, maintenance or modernization plans with clear knowledge of the expected outcomes and return on investment.

RISK RATING

One of the biggest advantages of X-ACT is its ability to discover known *and unknown risks* that other tools miss.

- X-ACT is able to reproduce dynamics and reveal process, technology or infrastructure risks that may be caused by any change in circumstances
- X-ACT uses a mechanistic model to avoid drawbacks of big data or heuristic approaches that are data dependent, time consuming and less robust

Having the capacity to predict events that have not yet happened is useful when making decisions related to modernization projects, climate change, load increases, infrastructure aging or equipment failures.

COMMON USE CASES

OPTIMIZATION

Utilities use X-ACT to clearly identify when and which actions should be taken to support the continuous efficiency and cost effectiveness of operations. X-ACT helps users pinpoint the cause of problems across all network segment and identify the best way to improve the cost, maintenance or capacity of various assets or processes.

Examples:

- Strategically optimize maintenance programs to extend the life of assets
- Identify where to place pumps to maximize water pressure
- Reduce costs by streamlining infrastructure or billing systems

PLANNING

X-ACT scenario analysis capabilities help water utilities define the best short, medium and long-term plans to keep key metrics such as costs, water pressure and water quality in line with regulatory requirements and business goals. As change programs evolve, X-ACT exposes potential risks and ensures that the project conforms to the promises made during the early stages of definition.

Examples:

- Create a stepwise program to meet government climate protection targets
- Know when and which assets to refurbish or replace
- Find out where to place sensors to get the most accurate readings
- Evaluate how changing consumption patterns will impact water pressure
- Validate whether the adoption of new technologies will meet project objectives

RISK MANAGEMENT

X-ACT helps users uncover and manage risks that traditional models miss. By creating a digital twin of all assets and processes, users of X-ACT can understand which scenarios will lead to unwanted outcomes and accurately quantify the risk of any project or activity.

Examples:

- Evaluate the risks and controls necessary to manage the increasing frequency and severity of weather events
- Understand how environmental impacts, such as rising air temperatures, will impact the quality of water
- Assess the financial, regulatory, operational, environmental or safety risk/reward of any change program