
AWS
re:Invent
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Ready, set, innovate: Building for the future

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Agenda

- Introductions
- About Innovyze, an Autodesk company
- The global water crisis is real
- Digital transformation is now urgent
- Innovyze’s roadmap for innovation & development approach
- Leveraging AI to drive cost efficiencies for Anglian Water
- Questions

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Introductions



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About Innovyze

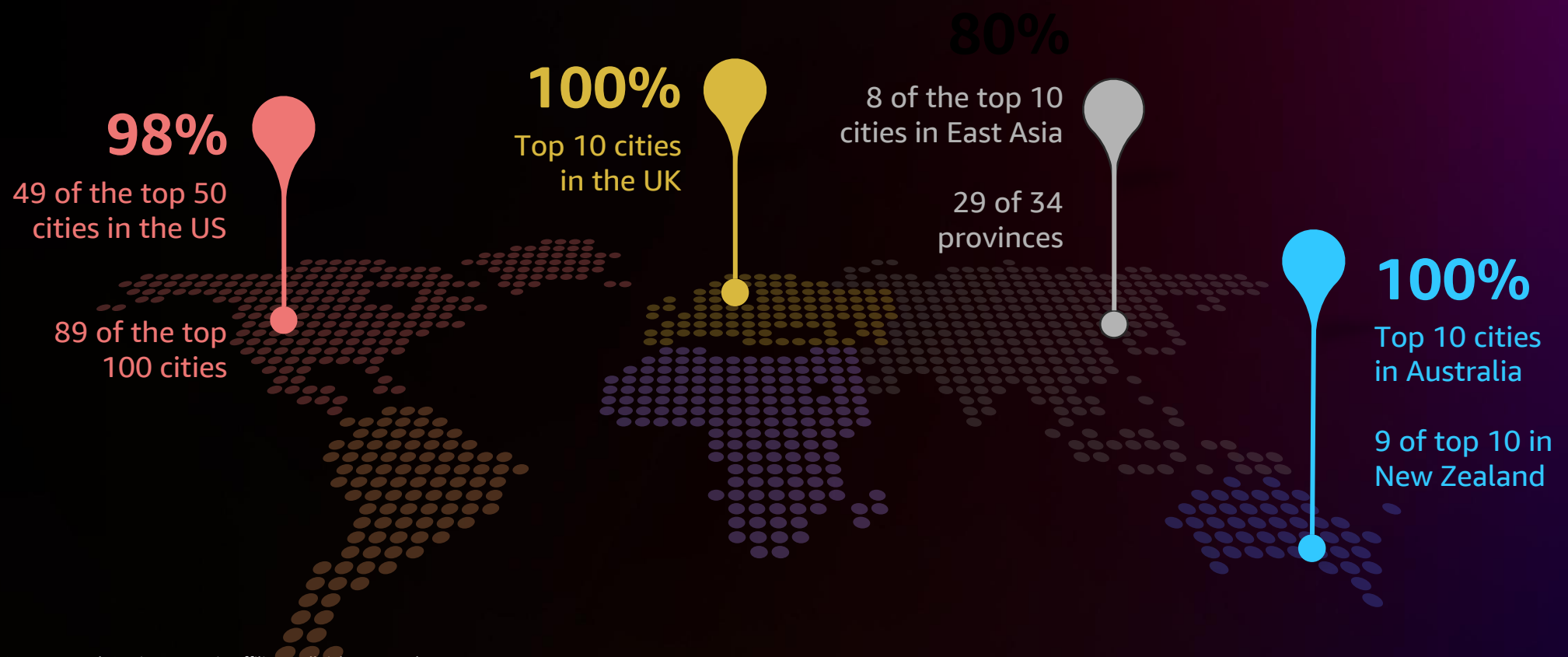
WATER INFRASTRUCTURE SOFTWARE EXPERTS

35+ years

6,500+ clients

60+ countries

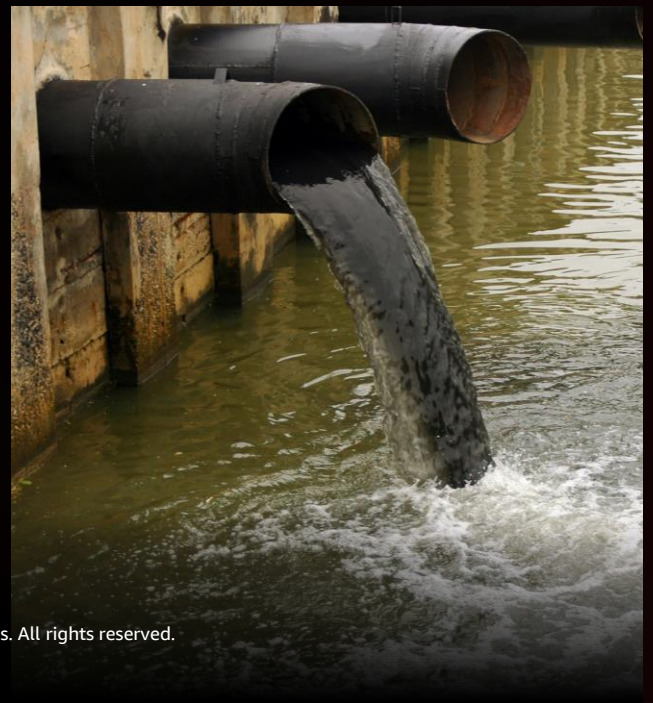
Asset management | Drainage | Stormwater, sewer & flood | Water distribution | Analytics



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The global water crisis

- **Scarcity** of clean water affects 1 in 10 people on earth
- **Poor water management** creates waste, pollution, sanitary sewer overflows, etc.
- **Climate change** contributes to drought, severe weather, and flooding
- **Health and safety** are compromised by contaminated water and flooding
- **Economic losses** are estimated at $1.2 Trillion by 2030

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Aging infrastructure

ACCESS, SAFETY, AND ECONOMIC RISKS

250K
breaks per year

In the US, a water main breaks every 2 minutes

$7.6B
wasted water value

4.6 billion gallons of drinking water are lost every day through leaky pipes

¥59T
asset rehab cost

In Japan, rehabilitation of aging assets will cost ¥59 trillion (US $533 billion)

1.5M
hours of discharge

England had 204,134 instances of untreated sewage release in 2019



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Digital transformation in water is now urgent

UTILITY CHALLENGES

- Consumption outpacing serviceability
- Energy and chemical use rising
- Regulatory pressure/fines
- Siloed teams and systems
- Broken workflows, data loss, and operational errors
- Digitization costs and expertise out of reach



UTILITY NEEDS

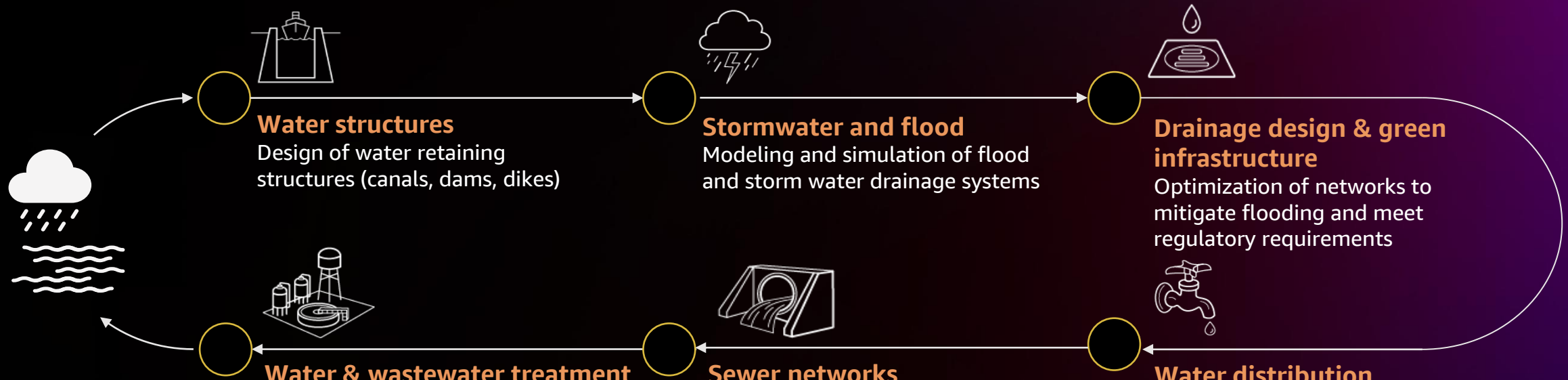
- More resilient systems and assets
- Better operational performance and efficiency
- Predictability
- Sustainability
- Better data/insights
- Improved planning, design, and construction of future networks and structures

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Innovyze captures the full water value chain

FROM CLOUD TO SEA



Water structures
Design of water retaining structures (canals, dams, dikes)

Stormwater and flood
Modeling and simulation of flood and storm water drainage systems

Drainage design & green infrastructure
Optimization of networks to mitigate flooding and meet regulatory requirements

Water distribution
Modeling of water distribution systems to ensure clean drinking water

Sewer networks
Modeling and simulation of sewer collection and other water quality–related systems

Water & wastewater treatment
Design and optimization of water and wastewater treatment plants

Design & hydraulic modeling
Integrated design and modeling of water systems to improve overall project productivity and increase engineering capabilities

Asset management
Analytical risk-based infrastructure management for water and sewer networks to reduce cost and risk of owning and operating water assets

Operational monitoring/predictive analytics
Real-time and actionable insights to reduce operational costs and enhance service reliability to help prepare for emergencies and optimize maintenance schedules

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Building Europe’s first smart canal



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AUTODESK

Info360 Cloud Platform

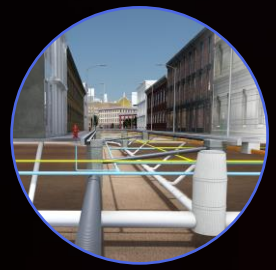
Operational analytics



Drainage



Sewer



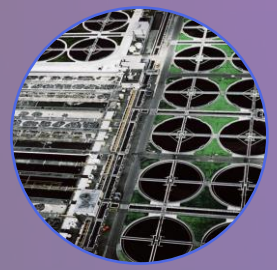
Water distribution



Asset management



Distribution analytics



Plant analytics

	Drainage	Sewer	Water distribution	Asset management	Distribution analytics	Plant analytics
OFFERINGS	InfoDrainage	InfoWorks ICM	InfoWorks WS Pro InfoWater Pro	Info360 Asset	Info360 Insight	Info360 Plant
TIERS	Standard Ultimate	Standard Ultimate	Single Tier	Ultimate	Info360 Insight – 500 channels Info360 Insight – 2,500 channels Info360 Insight – 7,500 channels	Info360 Plant – 50 MLD Info360 Plant – 100 MLD Info360 Plant – 250 MLD Info360 Plant – 1000 MLD
PURCHASING OPTIONS	1. Single-user subscription 2. Flex access 3. Enterprise token flex	1. Single-user subscription 2. Flex access 3. Enterprise token flex	1. Single-user subscription 2. Flex access 3. Enterprise token flex	1. Single-user subscription 2. Enterprise token monthly payment	1. Single-user subscription 2. Enterprise token monthly payment	1. Single-user subscription 2. Enterprise token monthly payment

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Dynamic digital twins let you . . .

Discover and visualize new insights, in the context of where and how people work

3



Dashboards & charts

Alerts & incident management

Inspection management

Connect any live or historical performance data to modeling, simulation and analytics applications

Domain KPIs

Asset planning & risk analysis

Simulation & impact analysis

Additional jobs to be done, TBD

4

Predict future performance using synchronized computational models that get smarter with every use

Deliver best-case actions to maintain the highest levels of service, capacity, and efficiency

5



2

Telemetry edge

Analytics & BI

Information repository
- Single-source data
- Networks, assets and metadata
- Saved user data

Mesh gen

Model transform

Sim runs

AI, ML, and optimization
- ML toolset (Emagin)
- GA-based optimization
- Time-series forecasting

Data integration API

I360 Mobile API

Innovyze desktop app API

Workflow integration API

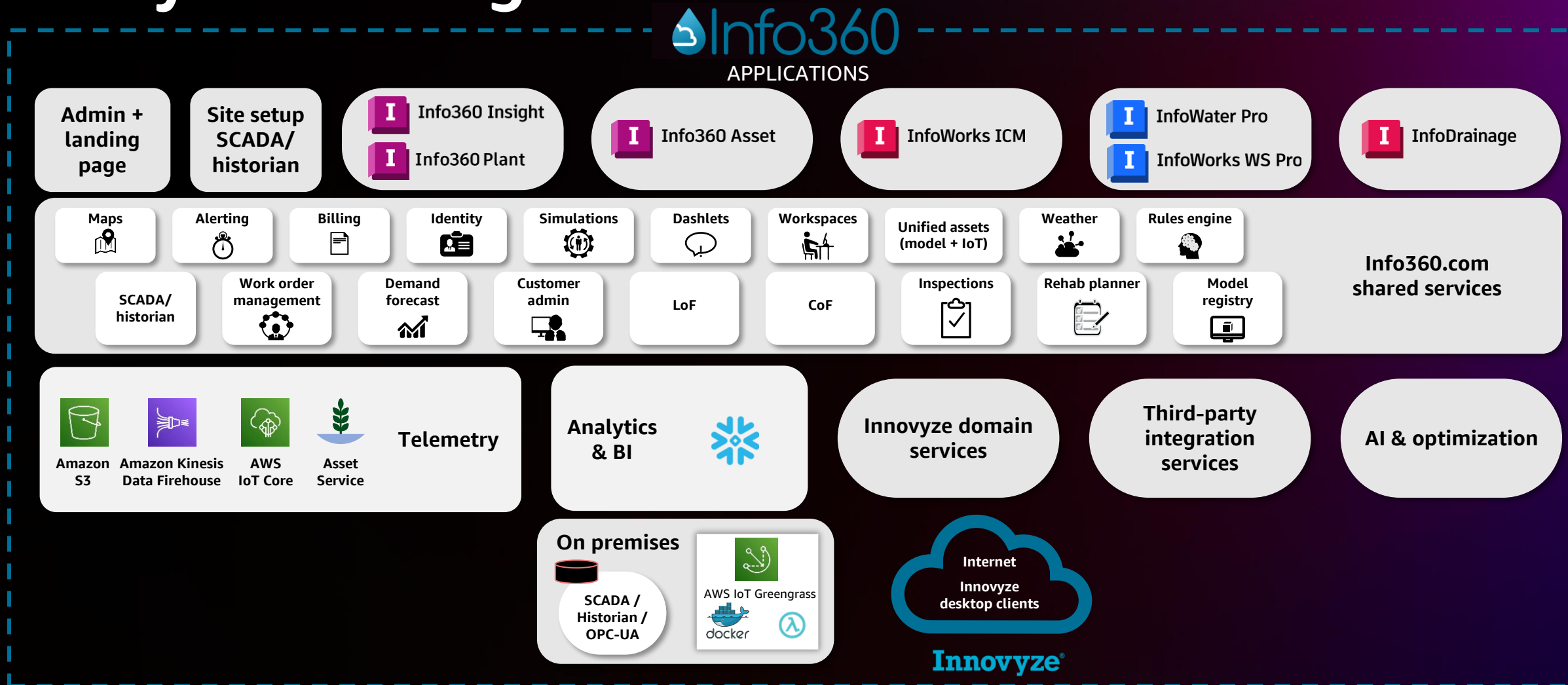
Gather and unify asset information

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Info360: Our vision of real-world water lifecycle management in the cloud



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Innovyze's development approach on AWS

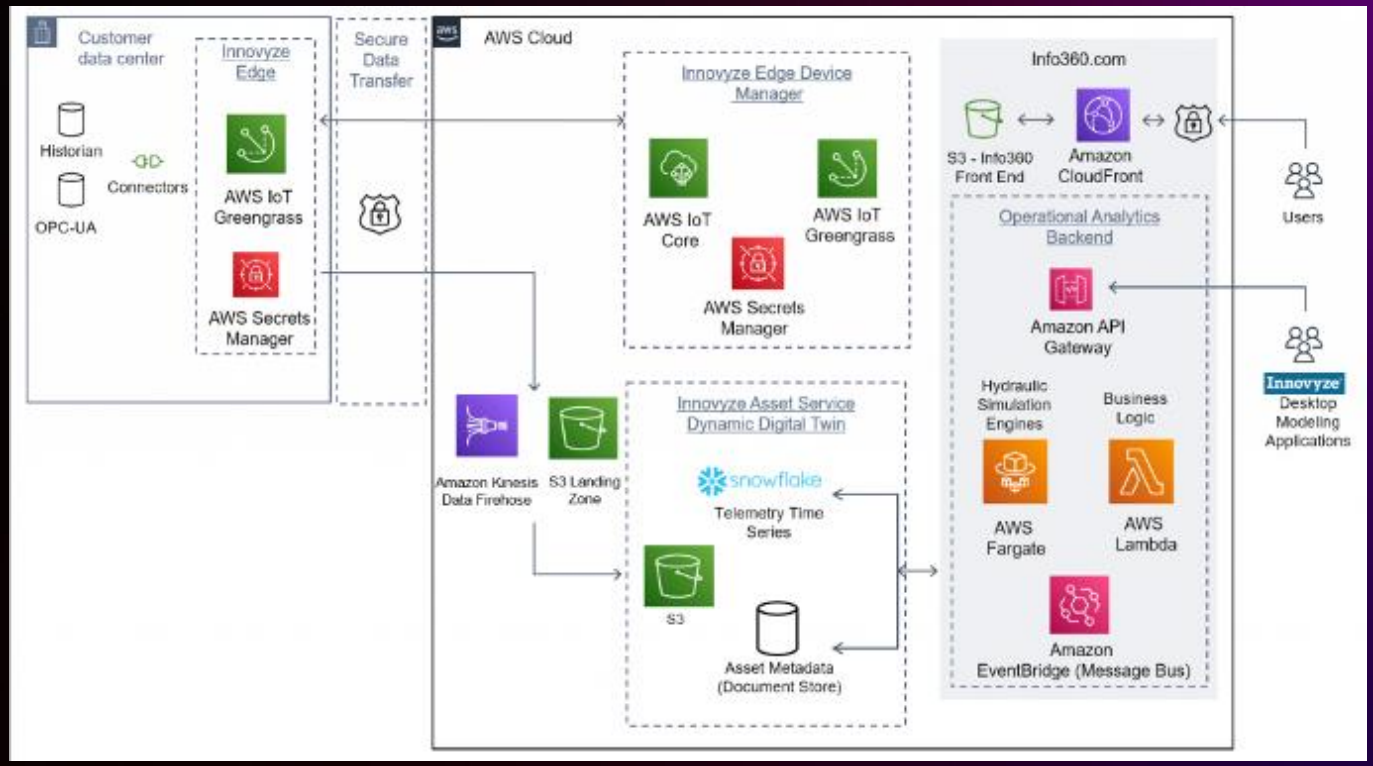
Minimize undifferentiated heavy lifting and use managed services as much as possible

Prioritize serverless to seamlessly scale and minimize DevOps overhead

Event-driven architecture with AWS EventBridge to decouple services and reduce dev team friction

Securely ingest telemetry data from on-premises SCADA with AWS IoT Core and IoT Greengrass

All of the above allowed us to be in market within 6 months of kick off



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Optimizing energy & chemical usage with AI

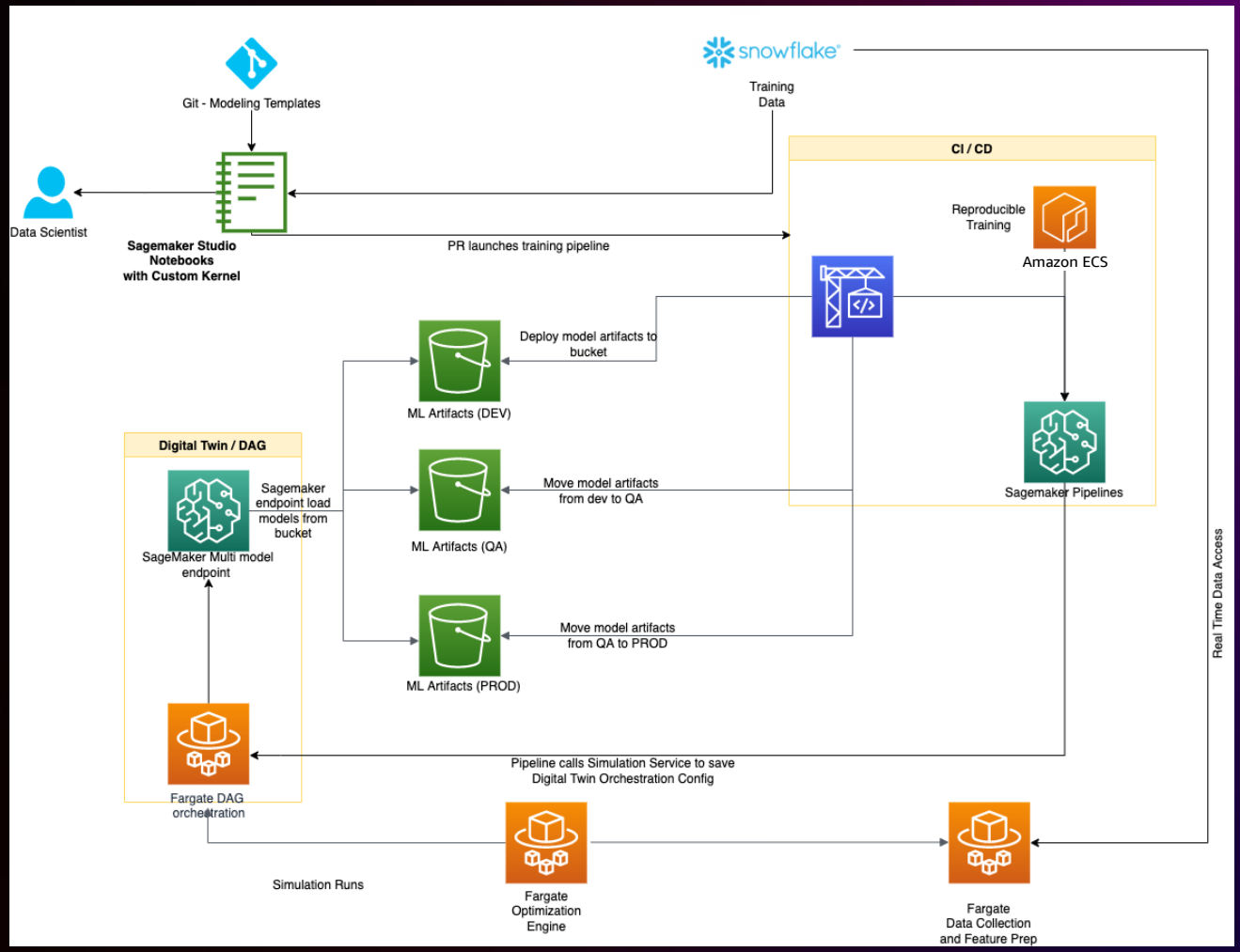
Data scientist pull template notebooks from Git to Amazon SageMaker Studio

Train multiple models per site using Amazon SageMaker training jobs pulling data from Snowflake

Share and collaborate experiments via SageMaker Experiments

CI/CD based on SageMaker Pipelines to effectively push models between environments

Deploy to SageMaker multi-model endpoint for inference cost savings



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Implementing AI to drive cost efficiencies

Challenge

Anglian was on a journey to provide the most efficient and resilient service to their customers but needed to transition their ageing infrastructure into the 21st century

Solution

Developed smart water strategy leveraging AI and working in collaboration with Innovyze. Anglian leveraged Emagin platform and machine learning capability to ingest and analyze millions of rows of historic data, which has built more than 30 models that continue to learn with connected links to live asset data feeds.

Solution predicts and dynamically responds to system disturbances, changing onsite operations. It allows operations staff to intelligently monitor and adjust setpoints in order to minimize system-wide energy and chemical costs, while ensuring system compliance.

Results

Project has already delivered savings of $167,000 that can be redirected to other customer priorities and has created a platform that has the potential to be rolled out across the rest of asset base and transform the way Anglian uses AI technology in their business.



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love every drop anglianwater

Questions



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