AWS re:Invent

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IOT219

Introducing AWS IoT TwinMaker

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Agenda

What are digital twins and how are they used

How AWS IoT TwinMaker can help you accelerate your digital twin journeys

How AWS is enabling an ecosystem to make digital twins more accessible to all customers

Customer use case: Hear from INVISTA (Koch Industries) on how they built a *Connected Worker* app using AWS IoT TwinMaker

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What are digital twins



Virtual representations of physical systems that are regularly updated with real-world data to mimic the structure, state, and behavior of the systems they represent and are used to drive business outcomes

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Business outcomes



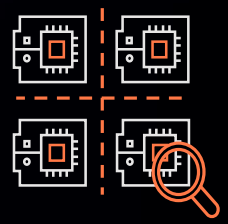
Engineering & Design

- ✓ Accelerate time to market
- ✓ Lower infrastructure costs
- ✓ Improve collaboration



Production & Asset Optimization

- ✓ Lower costs (energy, machines, labor)
- ✓ Improve machine or asset productivity
- ✓ Reduce production downtime



Quality Management

- ✓ Automate quality inspection
- ✓ Improve inspection accuracy
- ✓ Reduce product defects



Worker Safety & Productivity

- ✓ Improve employee productivity
- ✓ Monitor safety
- ✓ Reduce worker injuries



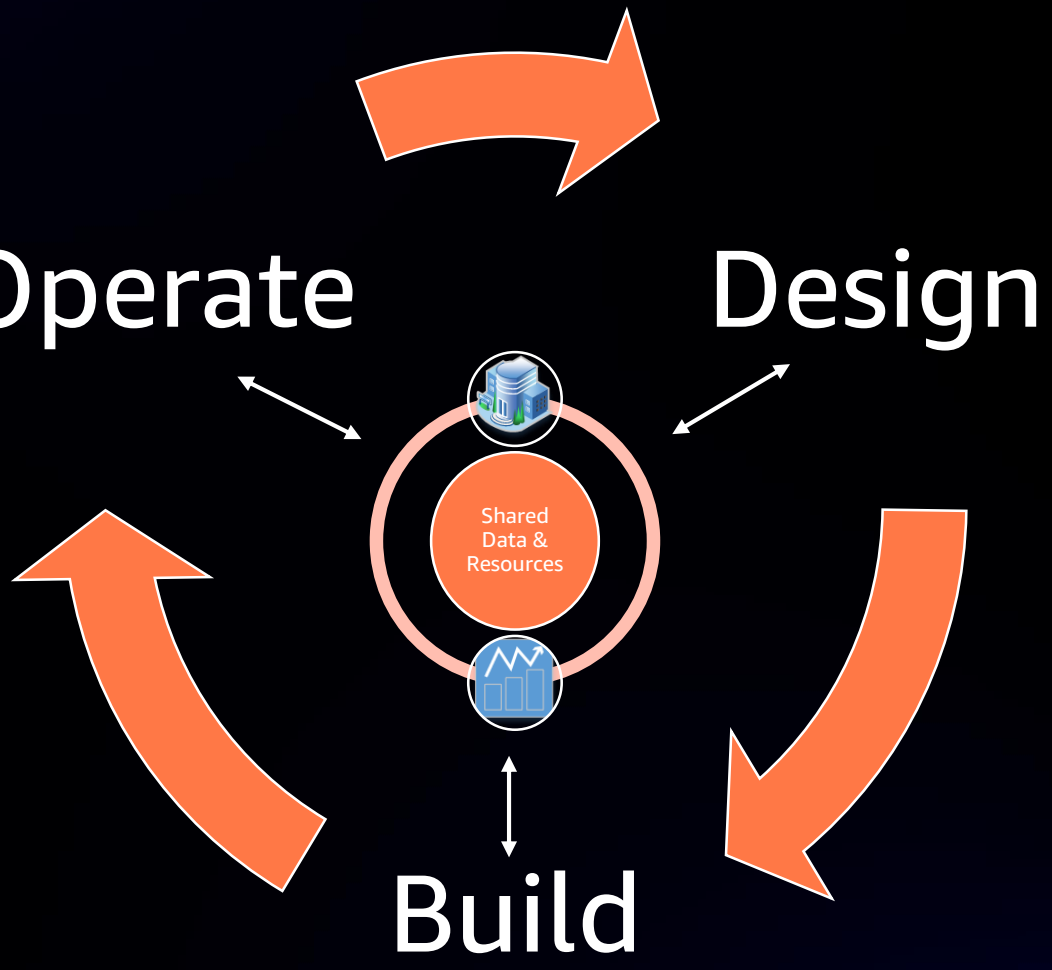
Supply Chain Management

- ✓ Improve forecast accuracy
- ✓ Reduce inventory costs
- ✓ Improve capacity utilization

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Data is a key enabler



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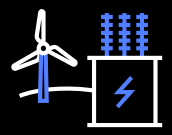
How are digital twins used in operations



Discrete and process manufacturing



Energy
(oil and gas)



Power and utilities, renewables



Smart buildings

Optimize routine maintenance

Use a virtual walkthrough of a facility to complete equipment maintenance routines quickly and remotely

Improve plant operations

Easily identify equipment and operational alerts in the context of the physical, on-premises environment

Increase process efficiencies

Connect process data to advanced analytics such as machine learning to predict and adjust equipment parameters to minimize waste

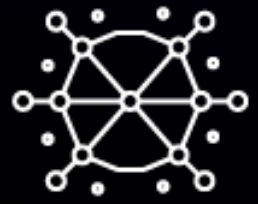
View entire environment

Combine disparate data, information, and insights from building operations into a single, comprehensive, real-time 3D view

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What makes digital twins hard to build



Using data from disparate sources



Modeling assets over their lifetime



Creating effective visualizations

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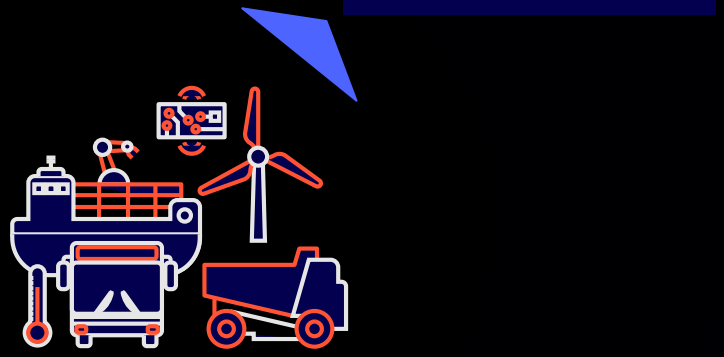
Introducing AWS IoT TwinMaker



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What is AWS IoT TwinMaker

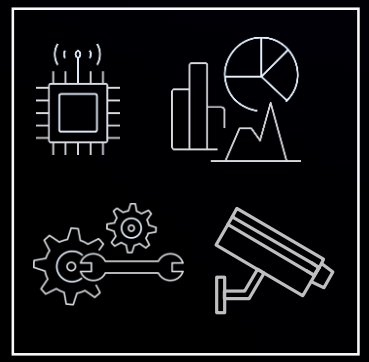
AWS IOT TWINMAKER MAKES IT FASTER AND EASIER TO CREATE DIGITAL TWINS



- ✓ Easily access data no matter where it lives
- ✓ Accurately model your built environment
- ✓ Create immersive 3D views

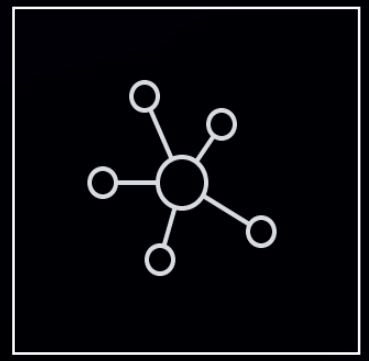
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How it works



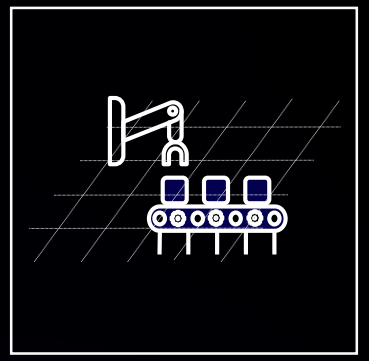
Data Connectors

Connect to disparate data sources where they live



Model Builder

Describe entity relationships and data properties



Scene Composer

Create 3D scenes with spatial anchors for data

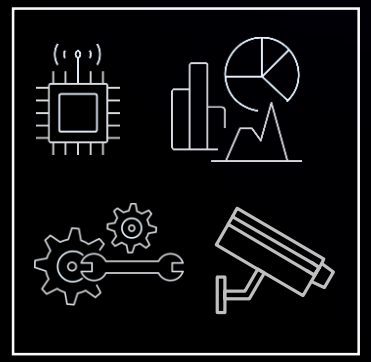


Applications

Build user-centric web apps on your digital twin

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Data Connectors



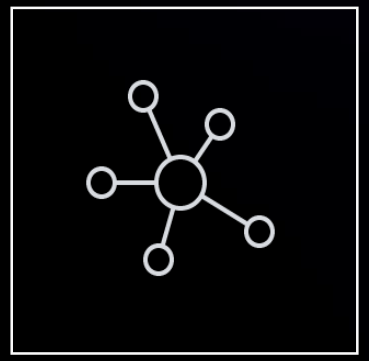
Data Connectors

Connect to disparate data sources where they live

- Fuse data across disparate sources; connect IoT sensor data, videos, documents, application data
- Connect to brownfield sources without moving data to a central location
- Support for AWS IoT SiteWise, Amazon S3, Amazon Kinesis Video Streams out-of-box. OR write your own connector (e.g., Amazon Timestream, Snowflake)

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Model Builder



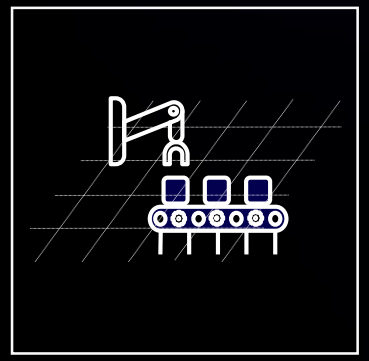
Model Builder

Describe entity relationships and data properties

- Flexible modelling to create knowledge graph
- Model entities, relationships, data connections, location
- Simple APIs to query data from stores

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Scene Composer



Scene Composer

Create 3D scenes with spatial anchors for data

- Build real-time 3D single pane of glass for physical systems
- Accepts open source and optimized *gLTF* format; supports converted CAD and point cloud files
- Overlay data and alerts on 3D views with interaction
- Easy to update as things change in the physical world

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Applications



Applications

Build user-centric web apps on your digital twin

- Low-code plugins for Grafana to create apps
- Get started with Amazon Managed Grafana

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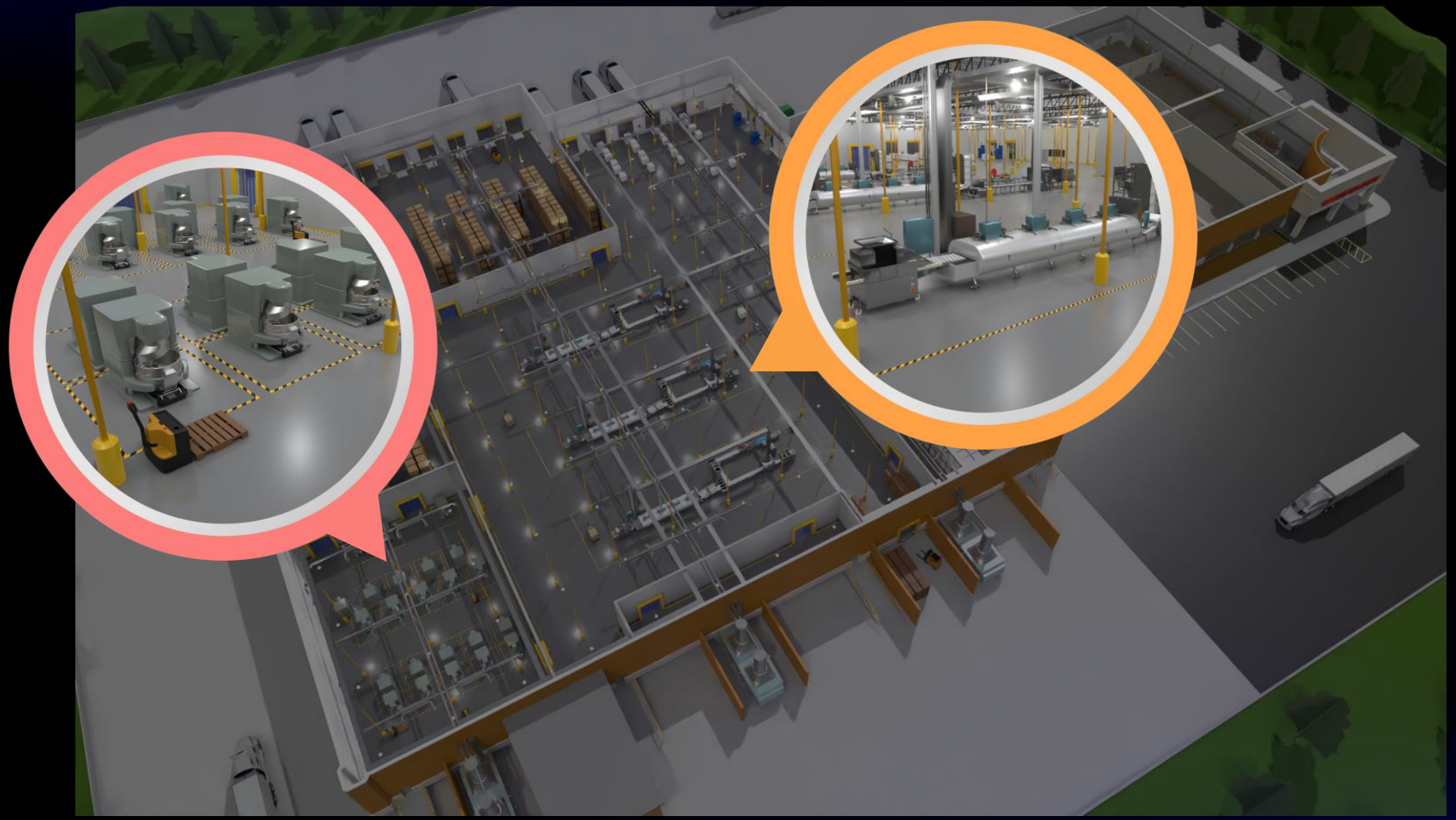
Amazon Managed Grafana

SCALABLE, SECURE, AND HIGHLY AVAILABLE DATA VISUALIZATION FOR EVERY DATABASE



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Getting started



Visit our GitHub page!

Start from a fully built cookie factory digital twin sample

Explore the service or adapt with your own data sets

Tons more samples available and more to come!

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Our Partners























Technology

Ready-made solutions that can help you quickly get started and achieve results with digital twins

Consulting

Address your unique use cases with customized digital twin solutions, domain expertise, and accelerated deployments

Tools

Support and simplify your digital twin building experience with innovative tools and services in 3D modeling, simulation, visualization, and more

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INVISTA Connected Worker

Dane Laughlin
Innovation Engineer
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Business outcomes



Knowing the location of machines in alert condition

Improve worker productivity in field operations



Replacing routine travel and walkthrough with remote monitoring

Building excellence in environment, health, and safety



Leveraging human expertise to create new value for our employees

Increasing employee satisfaction

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What we needed

snowflake®

Time series data

Matterport™



3D scans

OSIsoft. partner

Asset hierarchy

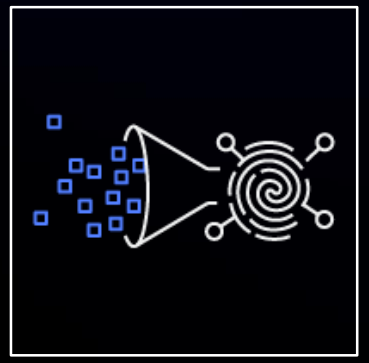


right information to the
right person at the
right time in the
right context

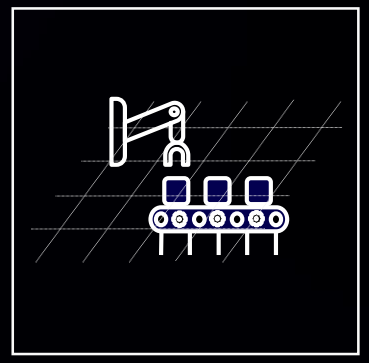
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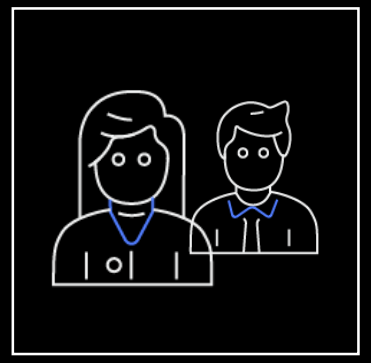
Challenges



Connecting dots between data sets



Building data contextualization platform



Enabling citizen developers

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"Using a digital twin of our manufacturing operations, our connected field personnel can proactively enable consistently high performance of our plant assets."

Jerry Grunewald

Vice President of Operations Innovations, INVISTA



Future plans



- Grow and scale capability across the company
- Foster and grow a citizen developer capability
- Continued strategic partnership with AWS
- Provide feedback to improve platform

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Thank you!

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