SIEMENS / Bentley®

A match made for **future-proofing infrastructure**

START

ALLIANCE

Thoroughly customer-centric and intended to last

Mission >

Advancing infrastructure digital twins to unleash new customer value

Offering >

Merging complementary strengths and expertise throughout the lifecycle

Customer value >

Creating cost-efficient, resilient, and sustainable infrastructure

INDUSTRIES

Increasing focus and infrastructure performance

Process industries >

Increased performance across the lifecycle

Rail and Transit >

Eco-friendly, competitive rail solutions

Urban infrastructure >

Reliable and resilient infrastructure assets

The unique strengths and expertise of Bentley and Siemens **empower our customers with innovative digital infrastructure solutions** to benefit from the combination of the real and the digital world.

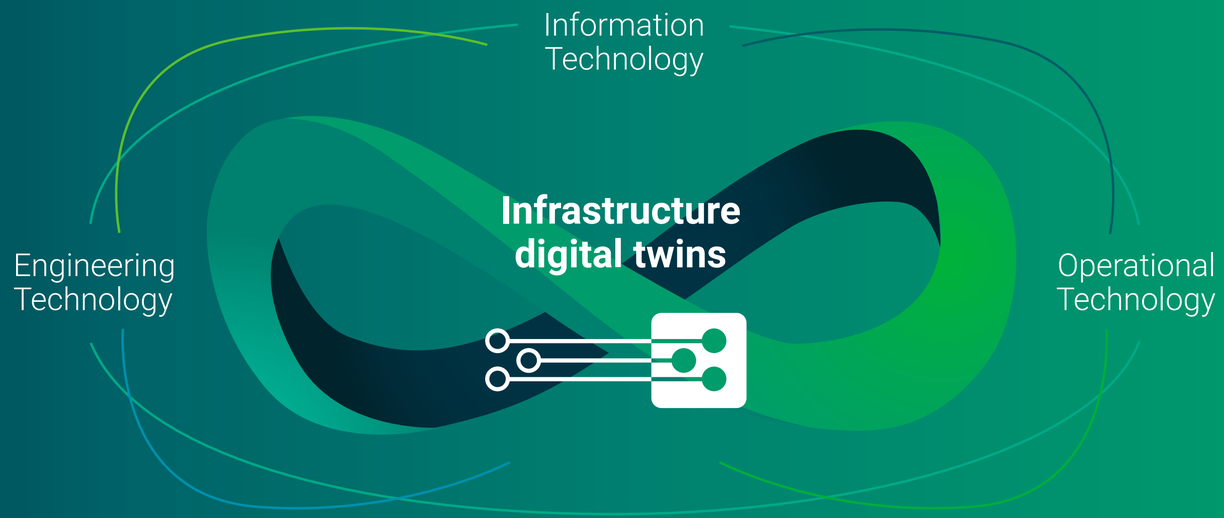
Matthias Rebellius
Member of the Managing Board of Siemens AG and CEO of Smart Infrastructure

Siemens and Bentley as strategic partners **bring new digital twin advances to infrastructure engineering organizations** and their constituents to enable more cost-efficient, resilient, and sustainable infrastructure assets.

Greg Bentley
Chief Executive Officer of Bentley

Advancing infrastructure digital twins

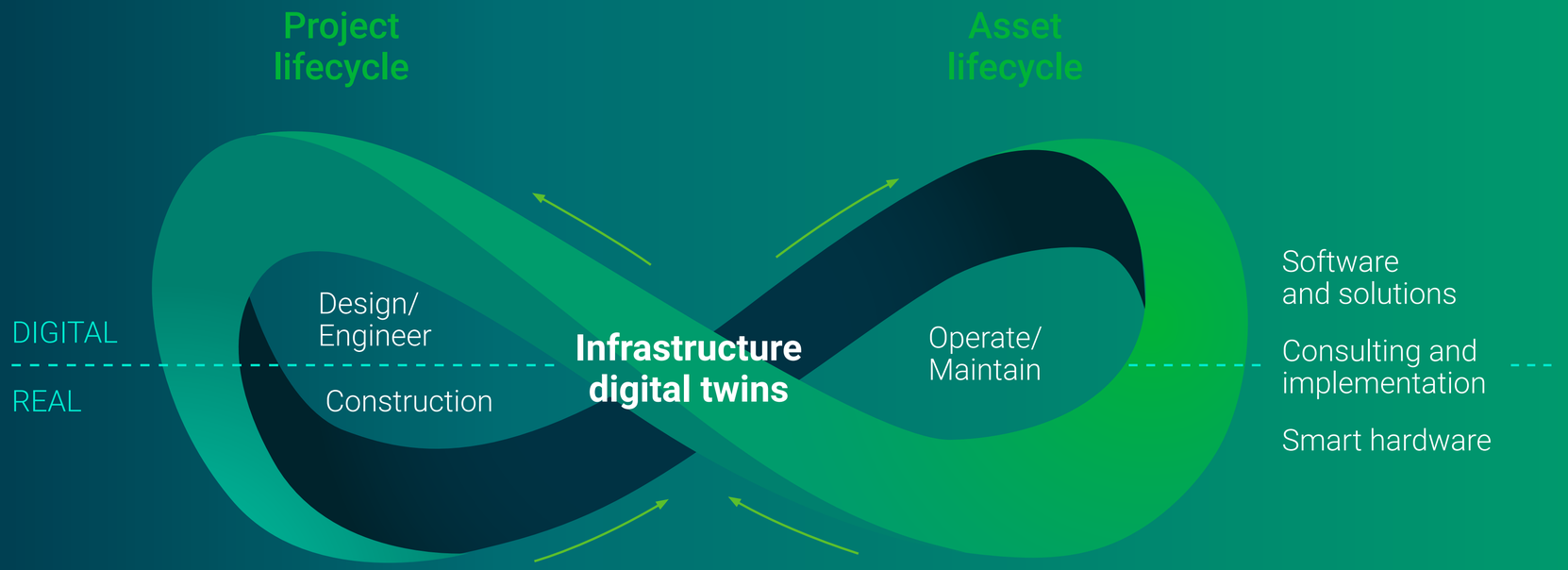
The alliance was formalized back in 2016 and today offers a unique range of software and digital twin solutions. These – and our ability to combine Information Technology (IT), Engineering Technology (ET) and Operational Technology (OT) data – help us gain valuable insights. By putting our complementary strengths to work along the lifecycle, we can improve CAPEX and OPEX spending – enabling us to build, optimize and extend intelligent infrastructure.



A unique lifecycle approach to infrastructure

With the unique breadth and depth of our joint portfolio, we can unleash new customer value along the infrastructure lifecycle by integrating the digital and real worlds for process industries, rail and transit and urban infrastructure.

Backed by our digital twin solutions our users find new possibilities to improve the design, engineering, construction, operation and maintenance of their infrastructure in every phase of the project and asset lifecycle.



POWERFUL ALLIANCE OF TWO GLOBAL LEADERS

Bentley

#1 in Electric Power T&D, Transportation & logistics**

#1 in SaaS, Collaborative BIM, Cloud, Water & Wastewater Distribution, Electric Power T&D*

90% ENR top 250 Engineering Firms

38 years operation, publicly traded on Nasdaq as BSY

64% Bentley Infrastructure Top 500 Owners

> 1,8 million users

186 countries

Combining comprehensive expertise in the **digital and real** infrastructure worlds

#1 in vertical software

SIEMENS

Global **#3** Distribution Control Systems vendor, # 1 in several industries software

> 12,000 industrial software engineers

14,000 railway vehicles and **3,000** interlockings

#1 in rail automation

~100,000 connected buildings

> 180,000 international customers served with 7,500 partners

45 million installed automation systems

Digital World

Real World

**ARC Engineering Design Software and BIM Market Analysis July 2021*
***ARC Asset Reliability Software and Services Market Analysis January 2022*

INFRASTRUCTURE DIGITAL TWINS FOR VARIOUS INDUSTRIES

Process Industries

- Solutions for integrated engineering, integrated operations, and performance management
- Combination of product and production with lifecycle management of plant infrastructure
- Holistic and cloud-based digital twins accessible as a service

Rail and Transit

- Data generation and management throughout the entire project
- Digital twin, engineering and data management for rail/transit project and asset lifecycle
- IoT-based automated inspections and measurements, self-maintaining assets

Urban Infrastructure

- Virtual collaboration and immersive visualization for accelerated decision-making and transparency
- Optimized asset lifecycle management for increased productivity and lowers cost
- Accessible, connected data and analytics for improved operational and sustainability performance

GENERAL CUSTOMER VALUES

One trusted partner for all infrastructure issues,
with a unique infrastructure lifecycle perspective

Federated Engineering (ET), Information (IT) and Operational Technology (OT) data of all relevant infrastructure assets

Improved data-driven decisions through visualization,
analysis and simulation

Improved project execution and design review for **faster time to market** –
and better change management

Optimized asset efficiency, reliability and sustainability
through continuous data monitoring and updates throughout the lifecycle
as reality changes

Better design for greenfield and brownfield infrastructure
at **reduced costs** with innovative planning and maintenance

INDUSTRIES

PROCESS INDUSTRIES

RAIL AND TRANSIT

URBAN INFRASTRUCTURE

PROCESS INDUSTRIES

Improved asset performance and reliability – critical for successful operation and a low carbon footprint of today's complex process plants. Siemens' and Bentley's digital twin joins the physical and digital worlds, offering valuable, insights into today's production plants by combining key aspects of design, construction and operational data. The result: more performance, less CO_2.

Benefits for our customers

- Greater understanding of how operating plants are really performing
- Improved operational and investment decision-making based on real-world data for the physical asset
- More targeted maintenance planning and execution based on real-world asset performance and reliability data
- Increased ROI of operating assets through optimized asset performance
- Better consistency, integrity, and communication of key data for all people involved in process plant design, construction, operation, and maintenance

Read our customer success stories ›

Brown and Caldwell

CUSTOMER SUCCESS STORY

Brown and Caldwell

Building
a better, more sustainable water infrastructure

5%
improvement in construction rework

Over 15%
cost savings during construction

> The new integrated **project delivery and collaboration platform** has enabled us to accelerate our **ongoing digital initiatives.** Today, more than 1,000 users access their projects faster – **without data loss.** The digital twins have **increased our quality** and **reduced construction costs.** All of this moves our company forward to **compete in the digital world.**

Shaun Severin
Senior Director, BIM | Brown and Caldwell

Brown and Caldwell

CUSTOMER SUCCESS STORY

Brown and Caldwell: Digital twins for collaboration

Challenges

- Combining and integrating inter-office/ inter-partner design data during design and construction
- Allow various types of data created from various design/engineering tools to be shared collaboratively
- Support aggregation of all data into a single digital twin to be used by all project stakeholders

Solution

- Successful design, construction and handover of a new greenfield water treatment facility
- Bentley-Siemens PlantSight and the Bentley iTwin platform for integrated project execution and delivery
- Using PlantSight to aggregate all 1D/2D/3D multidiscipline design data from Bentley and third-party design and analysis solutions during the evolution of the design

Benefits

- Construction changes reduced by more than 5% compared with past projects, with net cost savings of $7 million on larger projects during construction
- Reducing time needed to accurately maintain up-to-date data from design through construction and handover into start-up
- Increased benefits at the water utility/owner level by improving design insights viewing the facility prior to construction
- Seamless transition of relevant project data into operations and maintenance

Brown and Caldwell

RAIL AND TRANSIT

Digitalization and electrification are fundamental to building a greener, safer, more resilient and sustainable transport infrastructure. Siemens and Bentley have capabilities to optimize various aspects of rail networks including track, station, bridge and tunnel infrastructure from design, construction to operation deploying a digital twin.
A few benefits for our customers:

- Single source of truth – one common data source
- Reduced risks for engineers on site
- Cost reduction due to minimized possession times
- Maximize the use of unattended technology during operations and maintenance phase

Read our customer success stories ›

Egypt Rail ECML UK

High-speed rail network for Egypt

660 km
of modern, safe, and integrated rail system

up to **50%**
savings in travel time

70%
less CO_2 compared to current car/bus transport

// The digital planning of a catenary system enables us to **increase the efficiency** when designing overhead lines for a **fully functional rail electrification.**

Katja Elschner
Global Head Electrification CoC, Siemens Mobility

Siemens Mobility plans to utilize Bentley's OpenRail Overhead Line Designer for the fast-track design of the overhead catenary system in the Egypt High-speed rail project.

Egypt Rail ECML UK

East Coast Main Line UK

160km of Mainline Railway

>20M passengers served daily

>30% cost reduction on conventional renewals

// The program will involve **synthetic environments for design**, accurate infrastructure models and **hybrid ETCS L2* operation** that requires **no trackside signals therefore reducing the volume of trackside infra-structure.** This is a **significant industry opportunity** to reconstitute how signaling design and delivery is done to drive step **changes in methods, technology and delivery efficiency,** in a progressive and real-world application for each subsequent interlocking area of the tranche 4 roll out.

Toufic Machnouk
Programme Director, Network Rail Eastern Region

* European Train Control System Level 2

CUSTOMER SUCCESS STORY

East Coast Main Line UK – a more reliable passenger experience

Challenges

- Wide range of interdisciplinary information exchange across disciplines
- Complex, multidisciplinary design integration
- Critical construction activities in constrained worksites
- Multiple stakeholders with a range of needs
- Repetitive safety critical manual data inputs and data assurance
- Various requirements for survey data collection across disciplines

Solution

- A Common Data Environment for secure sharing and management of information
- Geospatial 3D design models for digital coordination
- 4D models for the simulation of complex construction activities
- Visualization techniques for communicating technical solutions
- Use of design tools for reuse and automation of the validation of data
- Geospatial survey data model accessible to all disciplines

Benefits

- Ensured single source of truth with security protocols
- More efficient design assurance and integration
- Greater planning certainty during high risk works
- Assurance the solutions meet stakeholder requirements
- Time savings in streamlining design and validation processes
- Fewer site visits for multiple survey data collections

URBAN INFRASTRUCTURE

Communities in cities and campuses should live, work and learn in perfect environments. They are striving to increase sustainability and resiliency to achieve economic growth and satisfying citizens but they face disparate data silos hindering seamless progress. Siemens and Bentley partner to create city and campus digital twins that enable data-driven services across the entire lifecycle.

Benefits for our customers

- Help users to better navigate complexity and support decision-making
- Streamlined collaboration in team and with stakeholders
- Improve asset performance and operation
- Optimize workflows and collaboration for internal and external stakeholders
- Reach infrastructure sustainability and resiliency objectives

Read our customer success stories ›

Siemensstadt Square

Siemensstadt Square

1 million m² more Berlin

Gross floor area

0 CO_2

A city district that is CO_2 neutral in operation is created

190,000 m²

efficient industry hubs

// A **holistic digital and integral city twin** offers the possibility to **pre-simulate and** significantly **optimize urban planning and operations.** This will lead to substantially more **sustainable and inclusive cities.** The goal is to develop a state-of-the-art **prototype for an urban digital twin together** with our partners for Siemensstadt Square."

Stefan Kögl
General Manager Siemensstadt Square

Siemensstadt Square

CUSTOMER SUCCESS STORY

Siemensstadt Square

Challenges

- To build an entire city district of over 70-hectare with a mix of different usages while continuing industrial operation
- Complex design and operational considerations to meet objectives for efficiency, resilience, livability and sustainability
- Project involves many project parties/ stakeholders across the lifecycle

Solution

- Federation of project data and visualization using Bentley's OpenCities 365, an urban digital twin solution powered by iTwin
- Optimized project management: creating and managing information on a construction project throughout its whole lifecycle
- Improved district performance from pre-construction to construction and the entire operation phase
- Digitally monitor, analyze, and optimize the urban district by new services such as KPI dashboards for usage distribution or energy demands

Benefits

- Improve project and stakeholder engagement through transparency in design, planning to operation phase facilitating decision-making
- Tailored access to combinations of trusted data such as design, utility network, GIS and IoT data for holistic visualization of developments and operational aspects

Imprint

Published by:

Siemens AG
Werner-von-Siemens-Strasse 1
80333 Munich | Germany
www.siemens.com
contact@siemens.com

and

Bentley Systems, Incorporated
685 Stockton Drive
Exton, PA 19341, United States
www.bentley.com

Contact Us