Bentley Systems' Design Integration Offerings Advance BIM to 4D through Digital Twins

October 22, 2019

"Evergreen" digital twins extend the value of infrastructure engineers' work, and of Bentley's open modeling applications *and* open simulation applications throughout asset lifecycles

SINGAPORE – The *Year in Infrastructure 2019* Conference – 22 October 2019 – Bentley Systems, Incorporated, the leading global provider of comprehensive software and digital twin cloud services for advancing the design, construction, and operations of infrastructure, today announced new additions and updates to its *open modeling applications* and *open simulation applications* to advance engineering digital twins throughout asset lifecycles. Bentley's open applications enable collaborative, iterative, and automated digital workflows spanning infrastructure professional disciplines. Now, with new digital twin cloud services, they extend business value and actionable insights throughout the construction and operations phases of an infrastructure asset.

"The broad acceptance of BIM has substantially benefited AEC professionals and projects over the last fifteen years, but now—with cloud services, reality modeling, and advanced analytics—we can advance BIM through digital twins," said Santanu Das, Bentley's senior vice president, design integration. "Until now, the use of BIM has been limited to static deliverables, which, after handing off to construction, quickly go out-of-date, losing the potential further value of the engineering data locked in BIM models. Now, with digital twins, we can open up the engineering data in a BIM model with its constituent *digital components* as a starting point, continually refresh the *digital context* with drone surveys and reality modeling, and—this is where it gets really exciting— continue to model and simulate the fitness for purpose of an asset over the *digital chronology* of its lifecycle. Finally, the value of the engineering data in a BIM model can extend beyond handoff to construction, and even beyond handover to operations, assuring and improving both project and asset performance. Advancing BIM to 4D through evergreen digital twins means that design models and simulations can serve a greater purpose than merely project deliverables, as the living asset's digital DNA!"

New Digital Twin Cloud Services for *Design Integration*
Bentley's design integration offerings now extend from desktop applications to cloud services to enable organizations to create, 4D-visualize, and analyze digital twins of infrastructure assets. *iTwin Services* enable digital information managers to incorporate engineering data created by diverse design tools into a living digital twin and align it with reality modeling and other associated data, with no disruption to their current tools or processes.

iTwin Design Review facilitates faster design review sessions. It enables practitioners to initiate "ad hoc" design reviews in a hybrid 2D/3D environment as well as project teams working on digital twins to conduct design reviews and multidiscipline design coordination. It provides workflows:

- (for practitioners) to markup and comment directly on elements of 3D models and switch between 2D and 3D views without leaving the 3D environment
- (for projects using ProjectWise) to visualize 4D digital twins—capturing engineering change along the timeline of the project, and providing an accountable record of who-changed-what-and-when

iTwin OpenPlant Design Service provides *OpenPlant* users with a distributed work environment and bi-directional referencing between 2D and 3D representations of plant digital components.

Open Modeling Applications and Open Simulation Applications
Sharing digital components and connecting digital workflows across disciplines are the foundation of an open modeling environment. Comprising *MicroStation*-based engineering and BIM applications specialized for asset types and solutions, Bentley's open modeling environment advances collaboration, enabling clash resolution and production of multidiscipline deliverables from any application.

Building its applications on the MicroStation platform ensures interoperability, access to a connected data environment, and digital services like *Components Center* for shared components libraries and *GenerativeComponents* for generative design capabilities. In addition, integrated engineering analysis and simulation empowers designers to iterate on various scenarios to achieve the most appropriate solution, not only for the initial design, but also for subsequent interventions and capital improvements to infrastructure assets.

Open Modeling Applications Updates
(New) *OpenWindPower* offers interoperability between geotechnical, structural, and piping analysis and design applications, automating data-exchange workflows between disciplines, to minimize risk in the design and operations of fixed and floating offshore wind farms. OpenWindPower enables users of a wind turbine model to check design status, perform analyses, mitigate risks, and generate insights into its predicted performance.

"OpenWindPower shortens the overall design cycle and effectively solves the problem of large design margins, reducing the cost of offshore wind power development," said Dr. Bin Wang, deputy chief engineer of the New Energy Research Institute, POWERCHINA Huadong Engineering.

(New) *OpenTower* is a purpose-built application for the design, documentation, and fabrication of new communication towers, and for the rapid re-analysis of existing telecom towers for tower owners, consultants, and carriers who need to continually update equipment. OpenTower's introduction is timed for the upcoming 5G rollout.

"With the help of Bentley's applications, tower design and analyses are easier, faster, and reliable. It also gives our clients satisfaction, trust and peace of mind, and improves public safety," said Frederick L. Cruz, president and CEO, F.L. Cruz Engineering Consultancy.

OpenBuildings Station Designer now includes *LEGION* and improves design quality by optimizing the functional space layout of the station building and the path of travel for the pedestrian.

OpenSite Designer now includes residential capabilities, supporting the conception and design of residential parceling and parcel grading, and custom parcel creation.

OpenBridge Designer now combines *OpenBridge Modeler* with the analysis and design features of *LEAP Bridge Concrete*, *LEAP Bridge Steel*, and *RM Bridge Advanced*.

OpenRoads SignCAD enhances *OpenRoads* to perform 3D modeling of signs within new or existing roadway designs.

Open Simulation Applications Updates
(New) Bentley Systems announced the acquisition of Citilabs, to enable its *CUBE* traffic simulations to be intrinsically available from *OpenRoads*.

PLAXIS and *SoilVision* geotechnical applications allow engineers to run multiple analysis methods, in either finite element or limit equilibrium, interchangeably. New interoperability with *RAM*, *STAAD*, and *OpenGround* enhances the quality of comprehensive geostructural solutions for integrated design and analysis of soils, rocks, and associated structures.

Digital Co-ventures for *Design Integration*

(With Siemens) Bentley's *OpenRoads* will take advantage of Siemens' Aimsun for micro level traffic simulation.

(With Siemens) The forthcoming *OpenRail Overhead Line Designer* integrates OpenRail Designer, and Siemens SICAT Master.

(With Siemens) *OpenRail-Entegro Train Simulator* combines Siemens Entegro and Automatic Train Control Simulation with Bentley's ContextCapture, OpenRail ConceptStation, OpenRail Designer, and LumenRT, for rail operations digital twins.

###

About Bentley's Design Integration Offerings
Bentley Systems undertakes to provide uniquely comprehensive and uniquely open modeling applications, and open simulation applications, for infrastructure design integration. Bentley's open modeling applications, including *OpenRoads, OpenBuildings, OpenRail, OpenPlant, OpenBridge,* and *OpenSite share MicroStation's* continuously advancing modeling environment to support each respective engineering and architectural discipline, and to increasingly enable automated and iterative digital workflows across all disciplines, for infrastructure conceptioneering (*ConceptStation applications*), design (*Designer applications*) and constructioneering. Bentley's open simulation applications, including *STAAD, SACS, PLAXIS, AutoPIPE, RAM, LEAP, MOSES, LEGION, LARS,* and *CUBE*, assure and improve compliance, resilience, and throughput. Design integration for all projects is advanced by market-leading iModel-based interoperability with third-party applications.

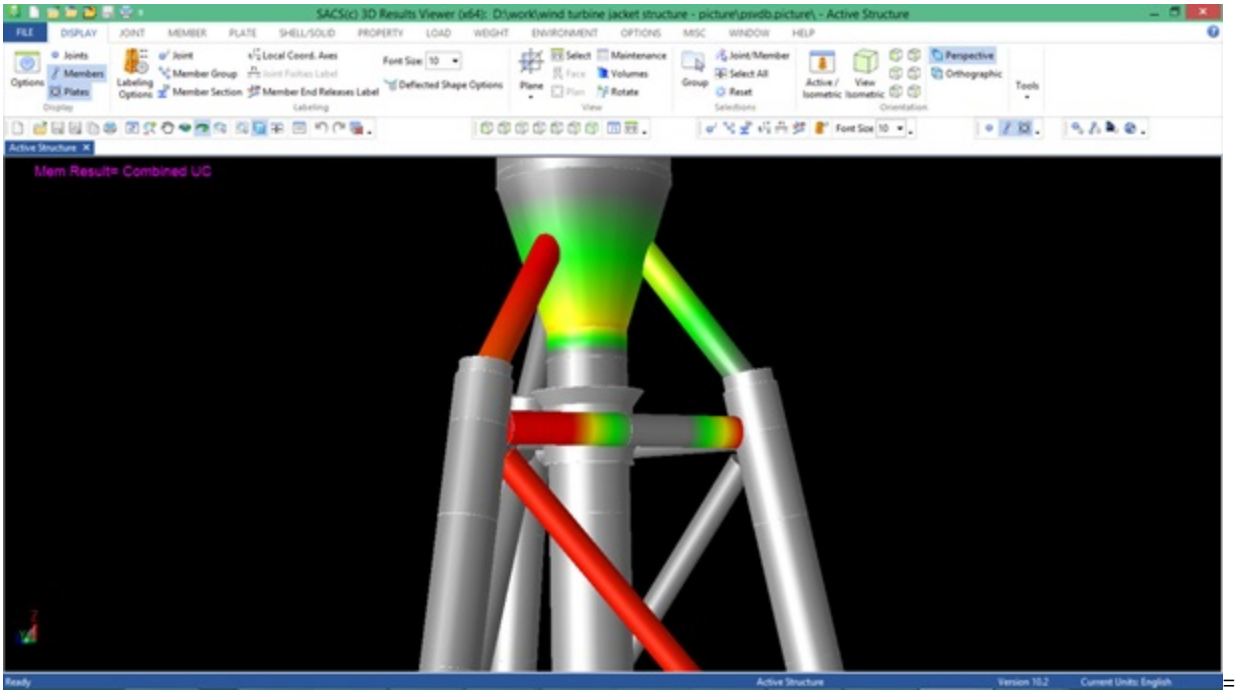
Bentley's *iTwin Services*, including *Design Review* cloud services for practitioners and for projects, advance BIM through "evergreen" 4D digital twins, ensuring that design engineers' work, with open modeling applications and open simulation applications, can continue to add value by sustaining fitness for purpose throughout asset lifecycles.

In 2019, ARC's *Engineering Design Tools for Plants, Infrastructure*, and *BIM* market study ranked Bentley #2 overall, and #1 in Electric T&D, Communications, and in Water/Wastewater. Among the *Engineering News-Record* Top 640 Design Firms, more than 90 percent rely on Bentley's portfolio for design integration across multiple disciplines.

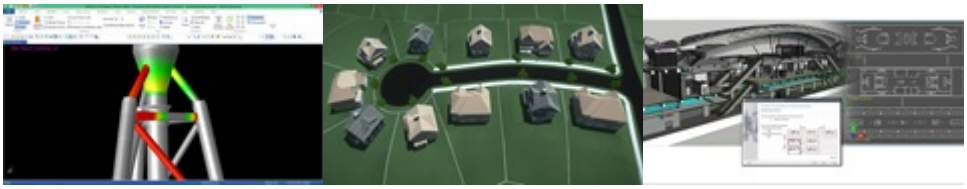
About Bentley Systems
Bentley Systems is the leading global provider of software solutions to engineers, architects, geospatial professionals, constructors, and owner-operators for the design, construction, and operations of infrastructure, including public works, utilities, industrial plants, and digital cities. Bentley's *MicroStation*-based open modeling applications, and its open simulation applications, accelerate design integration; its *ProjectWise* and *SYNCHRO* offerings accelerate project delivery; and its *AssetWise* offerings accelerate asset and network performance. Spanning infrastructure engineering, Bentley's *iTwin Services* are fundamentally advancing BIM and GIS to 4D digital twins.

Bentley Systems employs more than 3,500 colleagues, generates annual revenues of $700 million in 170 countries, and has invested more than $1 billion in research, development, and acquisitions since 2014. From inception in 1984, the company has remained majority-owned by its five founding Bentley brothers. www.bentley.com

Bentley Systems' SACS accommodates floating wind turbines constructed in deep water.



Images courtesy of Bentley Systems



Bentley Systems' SACS accommodates floating wind turbines constructed in deep water.

Bentley Public Relations

Christine Byrne
Director, Media Relations
1-203-805-0432