

Bentley Systems Provides A Range Of Solutions To Create, Maintain And Operationalize Digital Twins For Process Industries

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This report forms one in a series providing buyers of asset performance management (APM) software with comprehensive coverage of vendors and new value propositions. Bentley Systems is a US-headquartered firm with over 4,000 employees with users across 172 countries, with decades of success in delivering solutions to process industry clients. Bentley Systems offers a suite of offerings to build, maintain and operationalize digital twins, including its PlantSight and AssetWise applications. Three categories of operational executives should work with Bentley Systems to overcome complex asset information management challenges: VPs of operations in the process industries planning to deploy digital twins; oil and gas reliability engineers needing to leverage data from diverse systems; and maintenance managers in power utilities wishing to drive operational safety.

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ORGANIZATIONS MENTIONED

Advisian, AVEVA, Bentley Systems, BP, C3Global, Cohesive Solutions, Enterprise Informatics, EPCOR, Hatch, Hexagon, IBM, Ivara, Microsoft Azure, Nasdaq stock exchange, Oman Gas Company (OGC), OSisoft, SAP, Shell, Siemens, Southern Company, Sweco, The Cohesive Companies.

Bentley Systems Offers A Comprehensive Asset Management Offering For Process Industries

This report forms one in a series providing buyers of asset performance management (APM) software with comprehensive coverage of vendors and new value propositions. To learn more about recent developments at Bentley Systems, Verdantix spoke with Alistair Stubbs, VP Information Management; Anne-Marie Walters, Industry Marketing Director for Oil, Gas and Process Industries; and Sandra DiMatteo, Global Marketing Director for Industrial Digital Twin Solutions. We heard that Bentley Systems has:

- **4,000 employees with users across 172 countries.**

Headquartered in Exton, Pennsylvania, Bentley Systems was founded in 1984 by brothers Keith and Barry Bentley and is led by Greg Bentley, who joined the firm in 1991. In addition to its headquarters in Pennsylvania, US, Bentley Systems has regional headquarters in Dublin, Ireland and Beijing, China. In 2020 the firm employed over 4,000 people, with users located across 172 countries, and had annual revenues of over \$800 million. Bentley Systems listed on the Nasdaq stock exchange in 2020, raising \$235 million.

- **Decades of success in delivering software for built infrastructure.**

Bentley Systems is a software provider for the design, construction, and operation of roads and bridges, rail and transit, water and wastewater, public works and utilities buildings and campuses, and industrial facilities. Approximately 80% of Bentley Systems's revenues are derived from software targeted at built infrastructure projects. Its customer base is diverse; it has projects ranging from 3D building information modelling (BIM) for Chinese railways to creating a city model for Gothenburg, Sweden to improve urban planning and boost public engagement.

- **Enhanced its product capabilities through acquisitions and investment.**

Since 2010 Bentley Systems has developed a fully fledged APM software product through systematic acquisitions and internal product development. This includes the acquisitions of Enterprise Informatics in 2010, Ivara in 2012 and C3global in 2015. In 2020, with the acquisition of Cohesive Solutions – the largest reseller of IBM's Maximo in North America – Bentley Systems formed The Cohesive Companies, to deliver enhanced ancillary services.

- **Developed a leading solution for APM for the process industries.**

Bentley Systems emerged as a Leader in the 2020 Verdantix Green Quadrant of APM solutions providers, offering one of the most comprehensive APM software platforms, with functionality for asset health monitoring and for predictive and prescriptive maintenance (see [Verdantix Green Quadrant: Asset Performance Management Solutions 2020](#)). It also provides a complete digital twin offering, with capabilities that range from information management and 3D visualizations to analytics and physics-based simulations (see [Verdantix Buyer's Guide: Digital Twins For Industrial Facilities](#)). Customers that have implemented Bentley Systems's APM software include BP, Shell and Southern Company.

Bentley Systems Provides A Suite Of Offerings To Build, Sustain And Operationalize Digital Twins For The Process Industries

In 2020 Bentley Systems listed on the Nasdaq stock exchange, raising \$235 million. Over the last several years Bentley Systems has made a series of acquisitions to strengthen its APM offerings for the process industries. The firm offers a suite of solutions for implementing industrial facility digital twins, in order to manage information

throughout the life cycle of a facility or asset, visualize it and undertake advanced analytics. These solutions include:

- **AssetWise ALIM to maintain data integrity and relevancy.**

AssetWise ALIM (asset lifecycle information management) enables users to improve asset data management by keeping asset information updated throughout the different stages of the asset life cycle. This full life cycle approach is made possible through a set of capabilities for managing documents and records, defining and updating asset tags and structures and recording changes. ALIM can also handle spatial data to ensure that users can retain information on spatial networks, such as roads, rail, utilities and pipelines. Shell's QGC business, one of Australia's leading natural gas producers, based in Queensland, has a master tag registry for its assets that includes over 20 million data points. To handle a doubling of data from documents and model files, as well as migration of documents from systems based on energy performance certificates (EPCs), Shell QGC uses AssetWise ALIM software, hosted on Microsoft Azure. This has reduced tag capture time by 90%, as well as lost time from maintenance crews arriving on site without correct parts and tools.

- **PlantSight digital twin for easy-to-understand visualization of asset information.**

Through PlantSight, industrial firms can create a digital twin simulation of an industrial facility by aggregating and visualizing engineering data from piping and instrumentation diagrams (P&IDs) and other 3D models from suppliers such as AVEVA and Hexagon. PlantSight also has capabilities to manage changes to engineering data, with a timeline to show when the changes were made, who made them and how they were made. In addition, users can leverage analytical capabilities to gain insights into projects and assets and use visualization services to create 3D images of industrial facilities. PlantSight was jointly developed with Siemens and is a cloud-based solution hosted on Microsoft Azure. Hatch, a Canadian-headquartered engineering services provider, worked with PlantSight to create a connected data environment for the construction of a sulphuric acid plant in the Democratic Republic of the Congo. Using PlantSight, Hatch was able to digitize its workflows, removing reliance on pen and paper and cutting six weeks from the delivery schedule.

- **AssetWise Asset Reliability to develop asset strategies and prevent failures.**

Owner-operators use AssetWise Asset Reliability software to develop strategies for risk-based inspections, maintenance task analysis and reliability-centred maintenance. Users can identify assets that pose the greatest risk to operations by failure consequence, observe asset condition data and trends, and perform analytics to view the conditions of assets to enhance predictive maintenance and planning. The system also provides proof of regulatory compliance and distributed asset management and can optimize worker safety through the minimization of unplanned outages and the avoidance of catastrophic failures. EPCOR, a Canadian-headquartered power utility provider, worked with Bentley Systems to extend its AssetWise deployment to include statistical-based failure curves, and to integrate supervisory control and data acquisition (SCADA) data to determine electrical loading information in near-real time. These data were used to inform an asset health index and risk-based maintenance programme that reduced defective equipment outages by 43%, with a total system average interruption duration index (SAIDI) of 0.833 between 2014 and 2019.

Bentley Systems Delivers A Range Of Services For Digitization Of Asset Management

Bentley Systems has a suite of offerings for building, sustaining and using digital twins, which includes AssetWise ALIM and AssetWise Reliability and PlatSight. The operational excellence digital services market is set to grow

from \$22.1 billion in 2020 to \$29.9 billion in 2025, at a CAGR of 6.3% (see [Verdantix Market Size And Forecast: Operational Excellence Digital Services 2020-2025 \(Global\)](#)). Capitalizing on this, Bentley Systems provides a set of services that underpin ALIM which include:

- **Assessment of a firm's technological maturity.**

Firms planning to embark on a digital transformation journey often require expert partners to assist them with identifying their digital maturity and guide them in developing a transformation or acceleration roadmap. In the 2020 Verdantix survey of 259 operations and maintenance executives, 91% mentioned APM software implementation expertise as either 'very important' or 'important' in shaping their purchasing decisions (see [Verdantix Global Corporate Survey 2020: Operational Excellence Budgets, Priorities & Tech Preferences](#)). As part of its implementation offering, Bentley Systems includes an assessment of the firm's technological maturity, based on its implementation expertise. The assessment covers the identification of technological gaps, and of potential partners that can implement enablers further down the tech stack.

- **Cleaning of asset information from legacy systems.**

Over the last 20 or more years, firms have deployed a range of systems to manage their assets, leaving a messy landscape of point solutions and platforms filled with data siloes and inconsistencies (see [Verdantix Market Overview: Asset Management Software Landscape](#)). This creates a challenge for firms planning to accelerate their digital transformation. As part of its ALIM offering, Bentley Systems works with clients to clean their legacy systems' asset information and to ensure there is a single, accurate source of truth. For example, it works with road and bridge agencies to ensure compliance with regulatory reporting requirements, ensuring that information on inventory and the condition of assets is accurate and up to date.

- **Implementation services for Bentley offerings.**

Firms implementing software to manage their assets can choose to work with a range of different service providers. According to the 2020 Verdantix survey of 259 senior managers, 42% view asset management software providers as best in class for delivering asset management digitization projects. Bentley Systems has an in-house team within its Cohesive Companies of specialized consultants to assist with implementing its software. This team includes infrastructure industry subject matter experts, program managers, certified project managers and professional engineers, spanning over 40 distinct competencies.

- **Integration and maintenance of new asset management systems within the business.**

Ensuring the success of digital transformation projects requires the integration of new tools, such as wearables and handheld devices, and solutions into workflows, and the demonstration of the business case to multiple stakeholders (see [Verdantix Best Practices For Digitizing Industrial Asset Management](#)). Bentley Systems offers services through its Cohesive Companies to integrate new systems, such as APM solutions or digital twins, into a client's business. Bentley Systems then works alongside the client to maintain the integrity of the systems, ensuring accuracy of the data on the physical asset as changes are made during the construction, operation and decommissioning phases.

Firms Facing Complex Information Management Challenges Should Work With Bentley Systems

Bentley Systems offers multiple services that complement its digital twin offerings. Combining these software offerings and services enables users to solve complex information management challenges. Prospective customers that can benefit from working with Bentley systems include:

- **VPs of operations planning to deploy digital twins.**

In the 2020 Verdantix survey, 80% of respondents stated that digital twin simulations of plants and facilities would be either 'very significant' or 'significant' for their operational excellence initiatives over the next two years. Senior executives planning to deploy digital twins in capital projects should work with Bentley Systems to gain the combination of building and operations technologies information required for the simulation. Bergen, a city in Norway, and Sweco, an engineering firm, worked with Bentley Systems to establish an open connected data environment for the construction of the new Bybanen light railway system in Bergen, using iTwin Services. The environment enabled the sharing of information between 18 different engineering disciplines spread across five countries. This allowed Sweco to perform right-first-time engineering, a operations method designed to reduce wasted time – cutting project time by 15% and lowering the costs associated with construction errors by 25%.

- **Oil and gas reliability engineers needing to leverage data from diverse systems.**

Sixty-nine per cent of operations executives in the 2020 Verdantix survey mentioned open architecture for integration as either a 'very important' or an 'important' criterion when evaluating software applications for asset management. In 2017 the Oman Gas Company (OGC), which operates a 2,500-kilometre gas transmission network, worked with Bentley Systems and with Advisian, an engineering services provider, to implement AssetWise to digitize its reliability and integrity programme. The framework included risk-based inspection workflows and an integrity database management system, with integrations to the OSIsoft PI System and the SAP enterprise asset management (EAM) system. This enabled OGC to consolidate and analyse all condition monitoring and operational maintenance data, improving the visibility of condition degradation trends and critical health parameters.

- **Operations and maintenance managers in the process industries intending to drive operational efficiency and safety.**

Operations and maintenance managers in the process industries can work with Bentley Systems to ensure the safety of their operations. BP, a UK-headquartered oil major, worked with Bentley Systems to develop a central information store (CIS) for its Khazzan project in Oman in 2017. The CIS managed and maintained the information needed for operations, including 60,000 documents, 160,000 tags, associated metadata, and 3D visualizations. Bentley Systems assisted BP in moving all data from the project CIS into an operations CIS, to ensure safety and reliability of operations through integrity of information. Now, the CIS maintains the integrity of BP asset information to provide an accurate, up-to-date and comprehensive digital baseline for configuration, shortening approval times for required changes and eases access to data.



VERDANTIX CAPABILITIES

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Through our research activities and independent brand positioning we provide clients with:

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- Confidential advisory services such as commercial due diligence
- Thought leadership studies for brand building and lead generation
- Executive summits, roundtables and webinars
- Advisory workshops to rapidly increase your sector knowledge
- Multi-country and complex customer survey projects
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VERDANTIX MARKET COVERAGE

Environment, Health & Safety

Focuses on the software and services markets that enable corporations to improve their performance across environment, health and safety including compliance, risk and performance.

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ESG & Sustainability

Focuses on the decisions of investors, tech providers, financial services firms and corporate leaders. Conducting in-depth research on the full range of services and technologies required to succeed with ESG and sustainability strategies.

WHY VERDANTIX?

Verdantix is an independent research and consulting firm with a focus on innovative technologies that optimize business operations. We have expertise in environment, health, safety, quality, operational risk, as well as smart building technologies.

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