Bentley
Advancing Infrastructure

CASE STUDY

Shell's Gulf of Mexico Deepwater Group Industrialized Offshore Project Delivery While Supporting Its Carbon-neutral Future

Establishing an Integrated Digital Delivery Platform with AssetWise and iTwin Experience Cut Time to Find Information by 50%

DRIVING A STEP-CHANGE IN PROJECT DELIVERY

Having helped set new design standards for the world's biggest offshore platforms and pioneered safe, world-class quality operations at the deepest wells around the globe, Shell's Gulf of Mexico Deepwater group continues to pursue lower-cost, value-focused development options at lower carbon intensity. Aligned with these efficiency successes, Shell aspired to further improve the project cycle times of brownfield and greenfield projects, as well as meet their net-zero carbon ambitions. Using digital technologies as a key enabler, they identified two major business value propositions to drive a step change in project delivery from early-phase conceptual design to handover and operations.

To enhance design processes and take the next steps toward digital delivery, the team selected a portfolio of projects in the Gulf of Mexico to create an integrated deep-water project delivery platform. The project is a company and industry first, bringing end-to-end project delivery workflows into the digital domain and transforming the delivery of deep-water infrastructure. "The idea has parallels with the assembly line that transformed the automobile manufacturing business, driving a new era of productivity, transparency, and collaboration by not just accelerating current practices, but also delivering a fundamental change to how projects are delivered," said Vikas Jhingran, general manager, Shell Upstream Digital and Technology.

INTEGRATING MULTISOURCED DATA AND MULTI-ORGANIZATIONAL WORKFLOWS

As an industry-first, end-to-end digitization over the entire lifecycle of the project presented challenges, including integrating multisourced data and collaborating among multiple organizations on complex projects that can span years across multiple facilities. "Projects at this scale involve thousands of people within Shell and in the wider ecosystem, with typically tens of companies working together to get these projects over the line," said Jhingran.

Shell wanted to eliminate data silos and create an integrated project digital delivery platform, developing a single source of truth from starting a project in the early design phase to delivering to a digital twin for operations and beyond. However, they needed to integrate data and 3D models from specialized subsea design applications with equipment requirements into a digital twin system. This integration would provide all engineers and participants with access to documentation and schematics, as well as the ability to analyze various field strategies.

The project required considering three key aspects. First, Shell needed a visually integrated environment, allowing multiple parties to come together to collaborate in a 3D platform. They also had to implement connected data workflows that facilitate data maturity from the onset of a project, adding, enhancing, and eventually delivering that data to operations as part of a digital twin. Lastly, they needed to consider workflow orchestration, simplifying and standardizing workflows for consistency and change management. To incorporate these features into a holistic, searchable, and scalable single visualization of truth, Shell required open, interoperable technology applications.

PROJECT SUMMARY

ORGANIZATION
Shell Projects and Technology

SOLUTION
Process and Power Generation

LOCATION
Houston, Texas, United States

PROJECT OBJECTIVES
- To improve cycle times for Gulf of Mexico Deepwater projects.
- To establish an integrated lifecycle digital project delivery platform.

PROJECT PLAYBOOK
AssetWise®, iTwin®, iTwin Experience, PlantSight, SYNCHRO™

FAST FACTS

- Shell Gulf of Mexico Deepwater group identified digital technologies as a key enabler to improve project cycle times and meet net-zero carbon ambitions.
- Leveraging iTwin Experience and AssetWise ALIM with third-party modeling and document management technology supported an end-to-end open digital solution.
- Bentley's interoperable software provided a single source of truth for visual collaboration and digital twin handover to operations.

ROI

- Working in an integrated digital environment reduced the time for Shell's project teams to find information by 50%.
- Interactions with vendors during the tendering process and feedback sessions have seen improvements in collaboration efficiencies by approximately 10%.
- Design and project review sessions have been streamlined, enhancing workflow efficiencies by approximately 20%.

"With enhanced digital project delivery and focus on data-centricity, Shell can aggregate information and data from multiple applications across all phases and disciplines of the project across engineering, construction, and commissioning, as well as share all relevant information across all stakeholders."

– Vikas Jhingran, General Manager, Shell Upstream Digital and Technology

DEPLOYING OPEN, INTEROPERABLE TECHNOLOGY PROVIDES END-TO-END DIGITAL SOLUTION

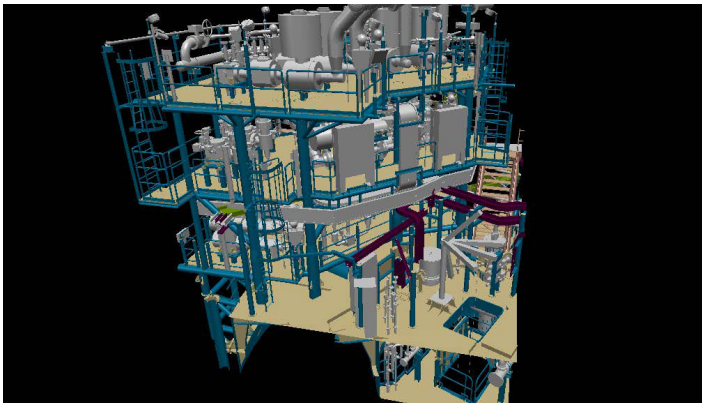
Already familiar with Bentley applications, Shell selected iTwin Experience and AssetWise ALIM as the foundation for building the digital platform. By using Bentley technology, the team could integrate with third-party sub-sea 3D modeling software and digital document management systems to create an open platform and single source of truth, accessible to all engineers and project stakeholders. "A key feature of this project delivery digital platform is that it is open," said Jhingran. This openness allows for visual collaboration to happen within all parties, whether they are within the Shell system or outside, and for data to be exchanged in accordance with industry protocols. iTwin Experience provides a flexible environment that links to other systems, aggregating information and data from multiple applications across all project phases and disciplines into a collaborative digital twin that can be handed over to operations. The technology platform is used in the design and execution phases to perform concurrent digital design, construction management, and reviews, and then to facilitate seamless delivery of a digital twin for lifecycle operations and management.

Shell's end-to-end digital solution begins by collecting multisourced data and importing it into iTwin Experience during the early project stages, providing a comprehensive picture and clarity of the project concept among the diverse project team. As the project matures, Bentley's open visualization and collaboration portal—combined with connected modeling, authoring, and document management tools—is used to engage external contractors to seek feedback, perform front-end engineering design (FEED), and conduct tendering processes. Simultaneously, AssetWise ALIM is engaged throughout the project to store, associate, and validate asset and design data. "[iTwin Experience] is the primary portal of the project delivery digital platform and is front and center, where all project information, such as 3D models, are stored, maintained, and [connected] to AssetWise ALIM for all documentation and change requirements," said Jhingran.

DIGITAL SUCCESS SUPPORTS REDEFINING OIL AND GAS INDUSTRY

Leveraging Bentley's open technology with third-party applications, Shell successfully developed their Gulf of Mexico Deepwater digital project delivery platform, integrating data and workflows from the conceptual stage to handover, streamlining capital project processes. Deployment of the project on the Gulf of Mexico portfolio is in progress, but results are already demonstrating a tremendous amount of efficiency for engineers who are constantly trying to find information and documentation related to the pieces of equipment. "Early indications are that by using the integrated ALIM and iTwin Experience environment, project teams have reduced [the] time it takes to find information by approximately 50%, compared with conventional tools and ways of working," said Jhingran. Interactions with vendors during the tendering process and feedback sessions have seen improvements in collaboration efficiencies by approximately 10%, while design and project review sessions have been streamlined, enhancing workflow efficiencies by 20%.

Working in an integrated digital environment optimized data access, visualization, and remote collaboration, eliminating work duplication. Shell's end-to-end digital platform provides visibility and transparency to project and engineering data across their deep-water portfolio and validates digital technologies as a key driver to delivering competitive projects. The digital platform can be scaled as projects expand or new ones arise, promoting efficiencies. "By driving cost efficiency, providing new and faster revenue opportunities, and changing business models, digital technologies are essential tools for the energy systems of the future," said Jhingran.



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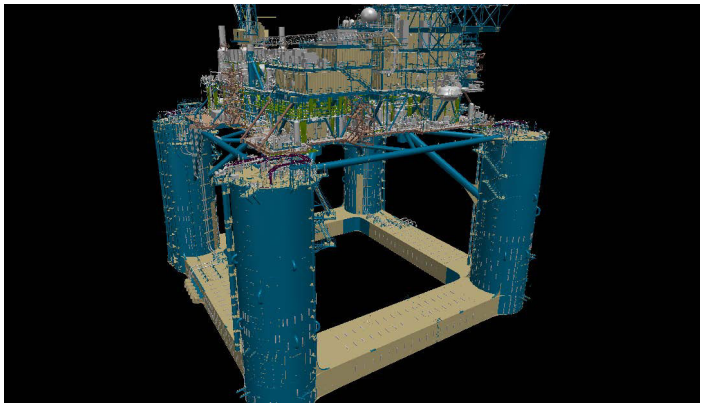

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