



# Pepper Construction Puts Oracle Construction and Engineering Solutions to the Test for Innovation Lab Build

## Introduction

The Oracle Industries Innovation Lab is a unique, hands-on space that brings together Oracle and technology partners to co-innovate and shape the future of construction and other industries. The lab, located outside Chicago, is home to a growing ecosystem of technology companies that work with customers from across industries to ideate, incubate, and demonstrate innovative solutions from Oracle and its partners.

Oracle and its construction technology partners today use the lab as a proving ground for augmented reality, Internet of Things (IoT) hardware, remote worksite applications, autonomous equipment, artificial intelligence (AI), machine learning (ML), and other emerging technologies to drive the industry forward in safety, quality, efficiency, and predictability.

A recent construction project that greatly expanded the facility from a modest outdoor space to a multi-story enclosed lab and auditorium gave Oracle, its general contractor, and technology partners an opportunity to put several lab technologies to use on an actual worksite. It also put Oracle's teams in their customers' shoes as the project owners and users of their own solutions.

## Pepper Construction digs in

Pepper Construction, which ranks No. 73 on the Engineering News-Record list of largest general contractors, was the general contractor for the Oracle Industries Innovation Lab project. Pepper welcomed the opportunity to use Oracle Construction and Engineering's solutions suite, as well as many Innovation Lab partner solutions, in constructing the new facility. Phase one of the project opened in August 2018, and phase two was completed at the end of 2020.

"Oracle's Innovation Lab is truly unique, and we had an incredible opportunity to use the construction project as a live lab for technology," said Jennifer Suerth, vice president, Technical Services, Pepper Construction.

## Build a solid foundation

Project success depends on a holistic approach to project delivery that spans the entire lifecycle, from planning and design to asset operation. Technology is essential to supporting this proven approach. Together, Pepper Construction and Oracle implemented solutions to manage scope, schedule, cost, and quality and leveraged them across the entire project lifecycle for a truly extraordinary outcome. (See Figure 1) Teamwork is also critical, and Pepper Construction and Oracle worked in lockstep throughout the initiative.

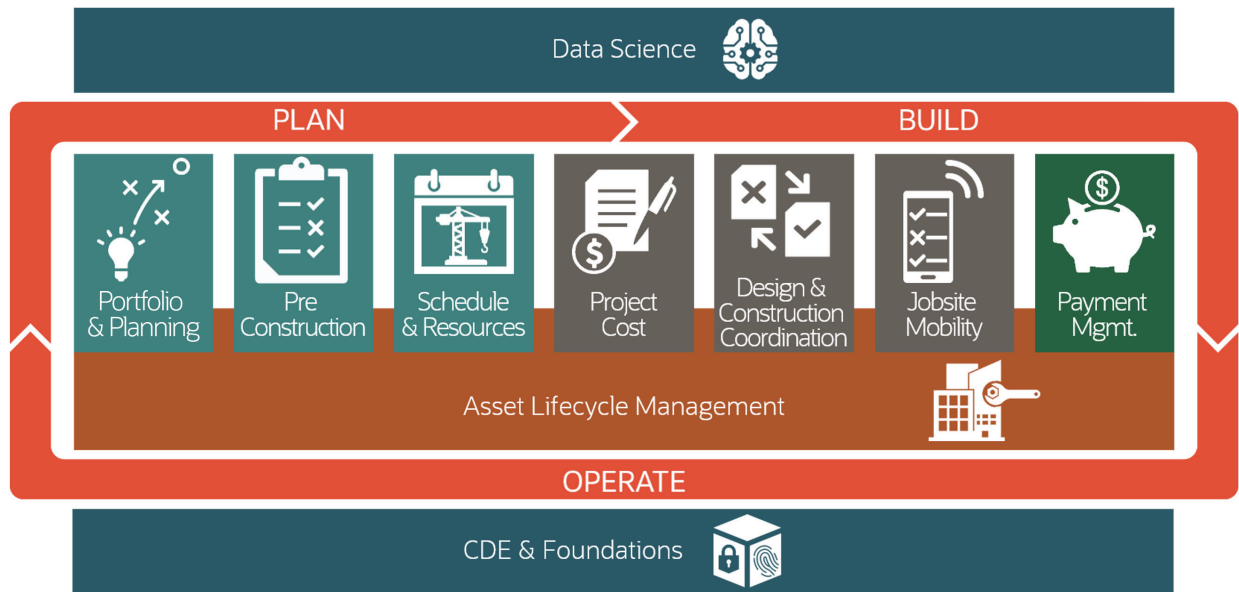


Figure 1. Execution approach

The technology line up included:

- **Planning and scheduling:** Oracle Primavera Cloud Service
- **Project progress and information management:** Oracle Aconex, Aconex Model Coordination, Aconex Connected Cost, Aconex Field, and Aconex Mobile app
- **Payment and compliance management:** Oracle Textura Payment Management Cloud Service

*“The level of transparency and partnership with Oracle on the innovation lab project was amazing. We formed very strong relationships.”*

– Jennifer Suerth, Vice President,  
Technical Services, Pepper Construction

## One schedule for critical path and field tasks

The schedule is the backbone of a project, and Pepper used Oracle Primavera Cloud Service to keep the project moving forward according to plan. Pepper used Oracle Primavera Cloud Service to develop an integrated critical path and field task schedule, achieving a single, central project schedule.

By integrating the critical path method (CPM) and field task management schedules, Oracle Primavera Cloud Service provides accurate, detailed, and up-to-date schedule information to superintendents and crews in the field. This powerful capability enabled Pepper to run pull-planning sessions virtually—which was much more efficient and convenient.

*“Oracle Primavera Cloud has a familiar scheduling interface. It’s easy to use, and the team was up and running after just a couple of one-hour meetings.”*

– Jorge Almazo, Project Manager,  
Pepper Construction



Automatic synch between the CPM and field task schedules gave team members the information they needed from the planning sessions without delay, so they could continue their activities without interruption.

“The task management functionality and integration with the CPM schedule is huge. No one else does this. The superintendents said if they had to pick only one solution to take to their next project, it would be Oracle Primavera Cloud Service,” said Suerth.

Pepper achieved a 70% increase in on-time task completion using Oracle Primavera Cloud.

## Simplify project information management

Pepper used Oracle Aconex to manage the communication, documents, data, and processes needed to keep activities on track and to provide a complete project record upon completion to Oracle Real Estate & Facilities, the owner of the Innovation Lab project.

The solution creates a safe, central hub for all data, providing private spaces for each organization’s internal project data that they may not want to share with other organizations. And, a single project solution eliminates the need for contractors to manage duplicate systems, reducing management complexity and technology costs.

Oracle Aconex drove efficiency in design and construction coordination, document management, project process workflows, and field management. For example, Pepper used Oracle Aconex Field to perform pre-commissioning activities, including

equipment start-up inspection checklists, which were updated via the Oracle Aconex mobile app. Pepper completed equipment start-up inspections 50% faster by automating this process.

*“Unlike basic file-sharing applications, Oracle Aconex is meta-data driven, so we don’t have to know a document title or folder name to find what we need. And, it helps to eliminate duplicate documents, improving control!”*

– Jorge Almazo, Project Manager,  
Pepper Construction

Oracle Aconex also supported a federated 3D model from all the trades. Pepper and its subcontractors used various building information modeling (BIM) solutions. Pepper then imported the models into Oracle Aconex Model Coordination to create a true common data environment and single source of truth that enabled end-to-end process management across all teams. Model coordination delivered immense value, from preventing field construction issues to giving the contractor prefabrication options that saved schedule time.

“Often times, tracking BIM coordination items is a segmented process. Using Oracle Aconex Model Coordination, it became more collaborative,” said Dan Kaepplinger, BIM Coordinator, Pepper Construction.

## Take payment management to the cloud

Pepper used Oracle Textura Payment Management Cloud Service to automate payment application processing. The collaborative solution boosts efficiency, enhances visibility, and limits risk by streamlining, standardizing, and automating payment and compliance processes, including lien waiver management.



Subcontractors benefitted from swifter invoicing and electronic payments and received immediate notification of any issues so they could take corrective action.

“We can pay our subcontractors as soon as we receive payment from the owner. There’s no delay,” said Jorge Almazo, project manager, Pepper Construction.

In addition, project payment information flowed into Oracle Aconex Connected Cost on a monthly basis to support cash flow analysis and became part of the full project record.

By the numbers: Pepper’s performance with Oracle Textura Payment Management Cloud Service	
Subcontractor invoice submission	Under a day
Subcontractor invoice re-submission	Under 1%
Subcontractor invoice approval	Under 2 days vs. more than 13 days—85% improvement
Subcontractor payments	2 weeks faster, on average
Payment application processing time	50% faster
Overall payment cycle	One week faster

## Manage change with confidence

If the one constant in life is change, this is doubly true in construction. The industry is constantly talking about how to best manage change using streamlined processes and how to decrease scope changes by increasing team involvement and communication during design. Pepper achieved both goals by using a full suite of collaboration solutions.

The core trio of Oracle Aconex, Oracle Primavera Cloud Service, and Oracle Textura Payment Management Cloud Service allowed Pepper to involve the full project team early on and give them access to the building models. This helped everyone to clearly communicate and visualize the project. Importantly, involving participants up front enabled input and informed decisions before construction, which reduced changes and costly rework.

Using Oracle Aconex, change orders can include links to scenarios created within Oracle Primavera Cloud, enabling reviewers to see tradeoffs and implications of changes to both the CPM and field task schedules so they can make informed and timely decisions. Oracle Textura Payment Management automates safeguards for change order billing, ensuring pay applications are not submitted until a change order has been approved in the accounting system.



## Meet the Innovation Lab partners

Oracle's technology ecosystem partners at the Innovation Lab delivered value-add capabilities to the technology stack to elevate project delivery to the next level.



Triax improves site safety and mitigates risk using an IoT platform to provide real-time, data-driven visibility into site access and worker and equipment location. Pepper integrated Triax with Primavera schedule data to monitor plan versus actual and ensure compliance with safety requirements. Pepper completed the Oracle Innovation Lab with zero OSHA recordable incidents or lost-time accidents.



Reconstruct uses photography and video with AI algorithms to create 3D models for construction progress monitoring. For the Innovation Lab project, Pepper integrated Reconstruct with the Primavera schedule and Oracle Aconex, adding the element of time to support 4D modeling so teams could easily compare work that had been completed to what should have been completed. This comprehensive visual representation of progress against planned schedule fast tracks progress validation and billing approvals, eliminating delays in subcontractor payments and keeping projects on track.



Sensera provides smart, live worksite cameras to support multiple activities. In addition to standard progress photos and a complete time-lapse record for monitoring, Sensera's site cameras, which were integrated with Reconstruct, provide images to support safety and security monitoring, decreasing worker risk and ensuring all project protocols are met.



Construction projects yield a massive amount of image data—and by integrating the AI-based safety observations from Newmetrix, previously known as Smartvid.io, with Oracle Aconex, the project is making the most of this rich data and increasing site safety.



Jovix provides material tracking capabilities using sensors to locate materials from order through installation. Pepper Construction used this technology to manage critical path materials, eliminating the need to manually track or expedite items and reducing the potential for material-related schedule delays. As an example, Jovix gate readers were used to register delivery of materials linked to work packages and Primavera schedule IDs.



FARO's automated scanning integration with Boston Dynamics' Spot robot is the first semi-autonomous workflow for contractors performing high-frequency scanning applications, such as progress monitoring, as-builts, and digital twins. This valuable data from FARO became part of the full project record in Oracle Aconex that Pepper Construction delivered to Oracle Real Estate & Facilities.

## Make data work for the life of the asset

Data quality, access, and insights from a project can impact the asset owner's bottom line for decades. Pepper Construction implemented Oracle Aconex as the common data environment for the Innovation Lab, making the project record as valuable as possible for the entire life of the built asset. Oracle Real Estate & Facilities will benefit from valuable insight into what decisions were made and why—data that is especially valuable when building similar projects and during retrofits.





## We're just getting started

"Oracle has created a playground for the construction industry, which is helping to build and enhance relationships with technology partners and clients. These efforts will continually change and improve the way we build," said Suerth.

The Oracle Innovation Lab is just one way Oracle is advancing the construction and operations of all built assets to improve global infrastructure and productivity. We're just getting started. [Connect with us today.](#)

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