SAP’s Industry Cloud Spotlight for the Engineering, Construction, and Operations Industry

Innovation for Connected Construction

June 2020
The engineering, construction, and operations (EC&O) industry is entering an inflection point where construction companies need to design and construct in more efficient and sustainable ways. Leading companies are embracing technology to completely connect the construction project value chain in ways we haven’t seen before. We are observing megatrends that are shaping the industry and the world of sustainability in real time:

**Future cities:** Real estate and construction companies will work with cities to build new smart neighborhoods or redevelop brownfield sites to make them sustainable.

**Circular economy:** Cities need a circular economy that reuses most resources by rethinking the entire product lifecycle from design, manufacturing, and delivery to usage and maintenance, refurbishing, and finally recycling.

**Sustainable energy:** Engineering firms will start to design energy-efficient homes and buildings that will follow green-construction guidelines. Solar panels and environment-friendly materials will be widely adopted.

**Global supply chain:** Tracking and tracing of goods along the entire supply chain is becoming a common albeit difficult and costly practice. Leading construction companies are using blockchain and digital twin technologies to track all physical, legal, and financial transactions to make global supply chains more efficient and reliable.

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**Global Supply Chain**

The EC&O industry is under pressure to build more sustainable and lasting communities. To make this happen, construction companies must better connect their supply chains through digitalization to achieve competitive design and plan and build efficiently.

Increased automation in prefabrication and on the project site with the use of cobots, 3D printers, augmented reality, and machine learning will increase efficiency even more. Through Internet of Things technologies, supply chains and construction operations will become completely transparent and managed on a global level.
Strategies for Connected Construction to Run as Intelligent Enterprises

Proven success strategies show a range of approaches to creating new business outcomes based on existing solutions and processes and on developing disruptive new business models:

**Digitalization of expertise and knowledge:** The industrialization of construction and the application of modular construction and best practices combined with experience data will help companies drive reliable outcomes and improve margins. Productivity can be increased and waste eliminated with real-time information. Construction will experience the dramatic productivity gains seen in other markets while vastly compressing the 50-year evolutionary process that took place in manufacturing.

**Connected construction sites:** Construction companies need direct connections to the construction sites to bring together all stakeholders and enable real-time, insightful decisions. Modern contracting is seeing a shift to vertically integrated contractors who own and operate large portions of the project supply chain. With connected construction, companies are coordinating from design through construction and delivering projects of greater quality in less time for less cost. Technology is enabling this.

**Digitalization of intercompany collaboration:** By 2025, construction companies will be able to share the latest information through model-based collaboration while delivering at the lowest possible cost. Project teams will be able to eliminate wasted worker hours spent waiting for materials or equipment with enhanced, model-based scheduling.

**Digitalization of commissioning and handover:** Construction companies need to build a platform for innovation and business process optimization, connecting the workforce, field equipment, the supply chain of contractors and suppliers, and owners and operators.

**Digital supply chain:** Construction companies are modernizing the design, build, and delivery process, and this requires a new connected supply chain of contractors, material suppliers, and owners and operators.

**Digitalization of Intercompany Collaboration**

The SAP® Project Intelligence Network for Construction application allows project owners, project service providers, project suppliers, and public authorities to collaborate in capital projects using a common single version of truth.
From Best Practices to the Vertical Edge

In the digital economy, simplification and business innovation matter more than ever. Innovation must become an integral part of each department and discipline, so they all contribute to the evolution from best practices to industry next practices, right to the “vertical edge.” This enables cross-functional teams to experiment with new ways to create value for customers’ top line and bottom line.

Building a Workforce Fit for Expansion with SAP SuccessFactors® Solutions

Mota-Engil, one of Europe’s largest construction groups, is expanding into new, emerging markets in Africa and Latin America. To help ensure its workforce can meet the demands of this expansion and to help the group achieve its goal of becoming a global leader in the construction industry, Mota-Engil is transforming its talent management processes with SAP SuccessFactors® solutions. Its long-term goal is to replace disparate, on-premise HR systems with a single, cloud-based standard.

“As our company grows, SAP SuccessFactors solutions are helping to prepare our workforce to meet the demands that this international expansion brings.”

Luis Filipe Monteiros, Head of Corporate HR and Sustainability, Mota-Engil, SGPS, S.A.

With SAP SuccessFactors solutions, Mota-Engil achieved 90% time savings for HR administration tasks and 80% cost savings on software licensing.
Road Map to the Vertical Edge

We have identified eight initial innovation spaces where we see the potential to move to next practices and the vertical edge jointly with our customers. Construction core processes offer a significant potential to move from current best practices to next practices using digital technologies and a digital mind-set.

Building the Intelligent Enterprise for the EC&O industry is a collaborative effort between our customers, partners, and SAP. We see opportunity in innovation spaces that are sparsely populated or even empty today. We know how many innovative ideas are out there in search for a platform to turn imagination into innovation and reality.

SAP’s intelligent suite and business networks are the perfect foundation for next practices and innovation at the vertical edge.

“Honeywell and SAP together will provide insights from the boiler room to the boardroom that make it easier for our customers to get a true picture of how to optimize building performance, lower carbon emissions to meet sustainability goals, reduce energy costs, and help enhance occupant experience. Having this information readily accessible will allow our customers to generate tremendous business value while becoming more sustainable, and it will greatly enhance the appeal of their buildings to renters and tenants.”

Darius Adamczyk, Chairman and CEO, Honeywell
Construction companies will improve and optimize win rate and manage risk with a single view of historical data for superior bidding. This will allow them to track project progress, cost, and margin with greater accuracy, in real time, and on any device. As a next step, they will need to adapt innovative construction models, such as prefabrication and modularization, either on-site or off-site, to provide increased productivity, decreased costs, and improved quality.

Modular construction firms such as TopHat are already accomplishing vertical integration using solutions from SAP partner LTI.

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Source: SAP Performance Benchmarking
Construction companies will start their journey by using intelligent forecasting and advanced analytics to get a global view of all operations across all areas of the enterprise, thereby optimizing their control over project status and profitability, resource utilization, global cash management, and risk management. They will then be able to digitally transition asset and equipment information from project to operational systems to improve information accuracy, lower costs, and expedite retention payments from customers.

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Source: SAP Performance Benchmarking
Each supplier, vendor and subcontractor works on their disconnected, individual systems with little or no real-time visibility into each other’s work, despite dependencies across multiple parties.

Rework, delays, and mistakes due to lack of communication and lack of real-time transparency during project execution are the norm.

Cloud-based network enables collaboration with all project stakeholders including owner, contractor, subcontractor, engineers and architects, facility management, and authorities.

Different disciplines, such as structure, architectural, electrical, and plumbing, as well as engineering, logistics, project control, and service, are brought together into an open building information model (BIM).

Projects seamlessly operate at a new level of efficiency and engagement with experience data.
SAP’s Industry Cloud – A Joint Innovation Space

Business innovation is driven by everyone – customers, partners, and SAP. It starts with ideas: how to fix a problem, how to discover and unlock new value, how to deliver new business outcomes. Translating an idea into a business process or a solution needs an innovation space that comes with digital tools and content to build and deliver quickly and predictably. This allows developers and business users to focus on getting things done to push new solutions out the door.

**Industry Innovation Spaces**

Stand-alone applications struggle to deliver relevant business value. Enterprise applications always need access to essential business domains such as projects, cost centers, employees, and customers. We provide direct access to business domains and processes in the intelligent suite through APIs, while our business and technology services provide the tools and infrastructure to create and run innovative industry cloud solutions.

**Intelligent Technology at Your Fingertips**

Business innovation needs digital technologies that are ready to use to solve a business problem. SAP’s industry cloud powered by SAP Cloud Platform provides a full set of technologies ranging from user interfaces to robotic process automation to artificial intelligence and machine learning.
Open Innovation Platform and Ecosystem

SAP’s industry cloud is the platform for SAP and partners to deliver industry cloud solutions that unlock new levels of efficiency, extend end-to-end business processes at the edge, and enable innovative business models.

SAP partners will find a unique environment in SAP’s industry cloud where the data domains and business processes of our intelligent suite and business network are readily accessible through open APIs. The SAP’s industry cloud also includes technology libraries such as machine learning, artificial intelligence, data lake, and UI services, among others, and content from the SAP Model Company service. This allows our partners to accelerate innovation by focusing on the differentiating business capabilities they want to build and deliver to our joint customers to help them become intelligent enterprises.

This enables a spectrum of partnership and innovation models ranging from close co-innovation over identified white spaces to completely open innovation spaces with free competition to drive customer value.

The innovation models are complemented by a set of commercialization models that are strongly correlated to the value the solutions deliver to the business of our customers.

An example of partner-delivered innovations in the construction industry is ETM.next by SAP partner BearingPoint, which enables customers to manage the lifecycle of both owned and rented equipment.

Freedom of choice is a key value, so customers can choose any partner or hyperscaler to deploy their industry cloud solutions.

Open Ecosystems Deliver More Innovation
Open platforms, available to the wider ecosystem, have consistently delivered more innovation and choice for customers. Therefore our industry cloud solutions can be run by the major infrastructure-as-a-service (IaaS) providers, giving our customers the freedom to implement their own individual platform strategy.

Ecosystem Partnerships
SAP and Honeywell have partnered to solve one of the biggest issues facing the real estate industry today: making sense of data. SAP’s experience of providing systems that aggregate business data and Honeywell’s deep knowledge of operational technology data combine to help companies gain surprising new insights into building performance in a cloud solution, Forge Real Estate Operations.
SAP’s Comprehensive Partner Innovation Ecosystem

SAP has been the proud solution provider for the EC&O industry for almost three decades – starting from humble beginnings and growing into a position of supporting the core business of our customers. Today, leading companies are embracing technology to completely connect the construction project value chain in ways we haven’t seen before. The industry cloud opens the field for a new level of co-innovation with customers and partners, enabling next practices and new business models that help our customers capture the opportunities of connected construction.

Our open partner strategy gives our customers the choice of whom they work with to design the business models of the future; whom they partner with to define and implement business processes for efficiency and growth; and whom they trust with running their infrastructure.

EC&O industry partners such as LTI are leveraging SAP Cloud Platform to give customers extended capabilities to capture data in the field – where all the action happens in the construction industry – with mobile apps. Our partner Sodales Solutions, for example, is enhancing mobile experiences for the industry with its enterprise health, safety, and environment management solutions.

There are many journeys construction companies can take into the digital economy to become intelligent enterprises. No matter which they choose, our scalability, security, global reach, vibrant business networks, and business process knowledge across construction and adjacent industries are the success factors for our customers, our ecosystem, and SAP.

Engagement Model

SAP is the partner for the engineering, construction, and operations industry in the long run. We have established a co-innovation and collaboration model with many of our customers that is based on mutual trust and long-standing, value-based relationships.

This is the foundation to chart the journey into the new world of connected construction and connected real estate, to capture the opportunities and tackle the risks in the digital economy.

Co-Innovation Partners

SAP has partnered with Wipro to deliver a tenant acquisition management solution for real estate managers, Intelligent Real Estate Enterprise, based on the SAP Cloud for Real Estate solution.

SAP has partnered with LTI to offer a “construction in a box” solution in the cloud and Project Pay Chain solution for modular construction.

SAP has partnered with BearingPoint to enhance equipment management with ETM.next.