

# HOW BLOCKCHAIN WILL CHANGE CONSTRUCTION

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Blockchain technology is among the most disruptive forces of the past decade. Its power to record, enable, and secure huge numbers and varieties of transactions raises an intriguing question: Can the same distributed ledger technology that powers bitcoin also enable better execution of strategic projects in a conservative sector like construction, involving large teams of contractors and subcontractors and an abundance of building codes, safety regulations, and standards? “Increasingly, we are thinking more carefully about when and where we need to compete and what can we share and collaborate on,” said David Bowcott, global director of growth, innovation, and insight in Aon’s global construction and infrastructure group. Using blockchain to automate the contractual processes and paperwork underpinning these complex projects could save money, free up valuable resources, and speed up project delivery. (Unless otherwise noted, quotes are from interviews we conducted as part of our research.)

**Blockchain-Enabled Real Estate Development Projects**

In commercial real estate, Amsterdam-based HerenBouw is applying blockchain to a large-scale development project in the city’s harbor. According to Propulsion Consulting founder Marc Minnee, HerenBouw’s objective was to set up a blockchain-enabled project management system to make the building development life cycle more efficient. Minnee’s blockchain application for HerenBouw focused on registering transactions at legally binding moments, where accuracy and an audit trail are essential. “Blockchain provides a platform for clearly cascading work products down the chain and holding everyone accountable for completing key tasks,” said Minnee. The system’s benefits include timely information, unambiguous communication, and fewer mistakes. “Stakeholders have a clear and evenly distributed incentive to register these facts on-chain: Either you won’t get what you ordered or you won’t get paid,” said Minnee. They also develop trust, which reduces friction in their mutual business processes. “Stakeholders spend more time discussing creative design and building method options.”

**Blockchain Pilots in Construction Achieve Liftoff**

Aon, the global risk adviser to the construction industry, estimates that 95% of building construction data gets lost on handover to the first owner. Briq, a California-based blockchain firm, is demonstrating the potential to capture and secure a construction project’s documentation in a blockchain ledger that parties can navigate and give to the owner as a deliverable. Working on behalf of Minneapolis-based Gardner Builders, Briq developed a “digital twin” of a new office construction, with a room-by-room inventory of every asset. “When a product or specification needs to be found in a building, there is finally a place to go to simply search for what is actually in that building,” said Briq CEO Bassem Hamdy. The blockchain-encoded specifications are granular: paint colors, ceiling fixtures, LED bulbs, door hardware — plus manuals, warranties, and service life in

a countdown clock that building owners can monitor. “Any improvements and refurbishments to the building can be documented, and the whole repository can be transferred to new owners if the asset is put up for sale,” said Ellis Talton, Briq’s director of growth marketing. In other words, building owners get a living ledger of everything that has happened with the building.

### Overcoming Cultural Obstacles

Engrained practices in the construction sector will likely prolong widespread blockchain adoption. “The construction industry is technologically advanced in many aspects of what it does,” said Talton. “But the industry is very relationship-based. There are many family-owned firms and private companies. The selection of contractors and subcontractors can be based on relationships that have existed for decades.” Talton also noted that very little money — less than 1% of revenues — is invested in up-front contracting and technology infrastructure for managing complex construction projects (that number is 3.5%–4.5% in aerospace and automotive). “The vast majority of the projects costs are in the building process, including the people and materials,” he said. Scott Nelson, CEO of Sweetbridge (where one of us, Don, is an adviser), finds construction a natural for blockchain-based project management: “Projects are well-structured and contract-based. Objectives are clear — be on time, on spec, and avoid rework. Classic project management techniques still work, but projects can benefit from a more decentralized and agile approach, where transparency is high and parties can be compensated for outcomes as well as for work performed.”

### Identifying Applications of Blockchain in Project Management

Over time, blockchain will have breakthrough applications for project management. We encourage organizations to explore and capitalize on this potential. Here are a few next steps. Identify use cases for blockchain adoption. Look for where success depends on mobilizing resources across enterprise boundaries; where identities, contracts, and payments must be audited and protected; and where the provenance and ownership of assets must be tracked. Some ideas for this: a reputation ledger that tracks subcontractors’ deliverables could help to identify reliable subcontractors for a project

- smart contracts that identify accountabilities and trigger milestone-based payments could automate agreements

- blockchain-enabled applications that aggregate data into a shared project management dashboard could help to manage workflow

- a distributed ledger that keeps an end-to-end chronicle of the construction process could record all building inputs and assets, including warranties and maintenance checkpoints

blockchain-enabled apps that track materials, testing, and results against building codes and standards could streamline inspections

Develop prototypes and pilot projects. Do preliminary analysis: Audit the systems in use, consult their users, and think about who would need to be involved in identifying viable options, selecting one to prototype, designing the pilot, and participating in testing. Make a business case for investing in blockchain. Identify ways blockchain can increase project success, such as improving processes and organizational capacity to locate and share large quantities of data with specific individuals and entities. As David Bowcott of Aon said, "Collectively, we are all better off if we encourage data collaboration and use blockchain and machine learning to help us establish longer-term industry road maps for investments, and technologies that can boost productivity and efficiency and lessen risk." While the fundamentals of project management will remain important, blockchain enables managers to focus their talents on solving problems and achieving better project outcomes.