

# Can Blockchain Fix The Construction Industry's Productivity Problem?

Meet the Technology That's Shaking Things Up in an Industry That So Far, Has Lagged Behind Others

## MARKET CONTEXT

In construction, funding the right projects and completing them safely and efficiently is how value is created. Projects that are delivered faster and at a lower cost deliver higher returns. Unfortunately, the construction industry currently lags behind others in ways that really hurt those returns. The global economy, for instance, has improved productivity at over twice the rate of construction. Manufacturing boasts a productivity improvement rate over three times as high.

For the construction industry, this lagging productivity problem means that organizations are paying too much for their built assets. About \$1.6 trillion of value is being destroyed for these companies each year.<sup>1</sup> How did we get here?

Thirty years ago, new management systems like Total Quality Management and Six Sigma were being adapted to the construction industry with hopes they'd deliver the same breakthrough efficiencies they had in manufacturing.

A wave of technology promised similar gains. Enterprise Resource Planning (ERP) systems and automated workflows entered construction, in part to address Y2K concerns. This was followed by a wave of 3D CAD, Building Information Modeling (BIM) systems, and Energy Asset Management (EAM) systems. Most recently, Internet of Things (IoT) with Radio Frequency Identification (RFID) has been the focus, as well as drone, scanning, and imaging solutions.

The last several decades of trying to bring innovation to the construction industry, however, has created only modest productivity gains. The amount of data captured throughout the project life cycle has increased by leaps and bounds, but as a whole, the construction industry is only keeping pace with inflation. Why?

## THE ROLE OF TRUST BETWEEN STAKEHOLDERS

One continued drag on efficiency in construction is a lack of trust between project stakeholders. Construction projects tend to be bigger and more expensive than projects in other industries, so they carry a lot of fear and risk. Mistakes and bad actors can end up costing stakeholders an enormous amount of money. Stakeholders therefore try to mitigate that risk to an unusual degree.

The way that the construction industry tends to manage these fears today is through use of contracts and data hoarding. The self-imposed barriers act like the wall and moat around a castle. Everything must pass through a drawbridge and a gate to get in or out. All of this slows down construction and puts an overall drag on productivity.

### OTHER FACTORS HURTING PRODUCTIVITY IN CONSTRUCTION

High levels of risk in construction contribute to stakeholders being overly cautious about sharing information, but legacy systems and project contracts create additional barriers as well.

Let's use an example that occurs on just about every construction project today: erecting structural steel. First, there's a whole host of questions that have to be answered. You have to know what kind of steel and how much. You have to know the status of the design and the order. You have to know when the steel will be delivered and how much has been invoiced for it. Does the the invoice match the purchase order? Has it been approved for payment? Is the crew and the equipment ready to install it? How much has been installed so far and how many hours did it take? Has the structure been inspected and if so, when?

On many projects today, the answers to these questions are just not readily available to stakeholders. Construction projects generate tens of thousands of individual documents—many still on paper—all from dozens of different companies through their life cycle, so knowing where any one piece of information is and hunting it down can be a frustrating, time consuming process, even when the documents are digitized.

Document control is a major project function, but it's usually contained within the walls and moat of each one of dozens of companies involved in a single construction project. The information may be captured in one software program or another and some of it may be shared through a report or a dashboard, but typically only in very limited ways.

### HOW BLOCKCHAIN AND SMART CONTRACTS COULD CHANGE THE GAME

There's a lot of buzz about Blockchain and smart contracts these days and for good reason. Blockchains are not only faster and more secure than traditional systems, they're also more cost effective, which is why so many banks and governments are turning to them.

Blockchain is a shared, decentralized system that exists between all the parties involved in a project. It empowers an array of different organizations to do business with one another more easily using shared business processes that are encoded within a common platform.

From an IT perspective, Blockchain is typically offered as a service. Each company participating in a Blockchain sets up its own Blockchain node. An administrative function allows various levels of permissions.

So Blockchain is not only like a digital ledger that allows transactions to be recorded chronologically, it's also an *ecosystem* that lets organizations buy, track, and pay for goods and services more quickly and effectively. Used in combination with smart contracts, Blockchain is also like the world's most accurate, project manager. It works in the background to track the parameters of a contract and apply the contract's rules in real time.

#### FREEDOM FROM A DOCUMENT DRIVEN MODEL

On a construction project, there are usually a wide variety of construction services companies involved, even in its earliest stages. Typically, you have to wait to get contracts from all of them including follow-on paperwork as deliverables are added or changed. After each company has been engaged, you have to pay all of the companies involved and wait to get progress reports back from the field.

With Blockchain and smart contracts, by contrast, a centralized tracking system is created first. All the companies involved define the rules and penalties around the project, then the Blockchain automatically enforces those obligations as the project progresses. Was the steel delivered late to the project site? If the smart contract says a fee should be imposed in that case, the Blockchain can automatically impose and collect that fee via cryptocurrency.

The advantage is not only hyper-efficient project management, but a permanent, shared record of every transaction associated with a project and all the assets involved. In this way, Blockchains create an unbroken chain of trust between all key stakeholders. This approach encourages transparency and accountability because it can more precisely track the parameters of a project as well as how vendors are delivering against them. Blockchain liberates projects from being document driven to being *data driven*.

## FROM FLYING BLIND TO A BIRD'S EYE VIEW

Another potential advantage of Blockchain is that it could dramatically improve the global construction supply chain. In our example of erecting structural steel, the steel that moves through the project driven supply chain is an asset resource that can be tracked and controlled in a much more detailed, automated way using Blockchains and smart contracts.

A Blockchain automatically captures where the steel is at any point in time—all over the world. It identifies who has custody of the steel and what state it's in.

All this data is captured in the peer-to-peer network where transactions are stored and the relevant information is available to all stakeholders.

So, for all the different parties involved in the project, knowing where the steel and whether or not it's been used just got a lot faster and easier. Stakeholders can also know more rapidly if they need to order more materials and if so, how much.

The benefits of this kind of visibility accrue up and down the construction supply chain including easier inventory management, the ability to receive goods only as they are needed (also known as just-in-time planning), faster dispute resolution, and dramatically reduced waste. All of this adds up to lowered costs and accelerated schedules—construction's two biggest drivers of value.

## BLOCKCHAIN'S OTHER POTENTIAL BIG BENEFIT FOR CONSTRUCTION

In construction, the only thing that's certain on projects is that they're uncertain. The concept, scope, resources, cost, and schedule are all based on a combination of knowns and unknowns that evolve as the project progresses. The ability to manage and forecast change, therefore, is possibly the single greatest attribute of successful projects. What often gets in the way is a lack of timely information.

Blockchain's other big potential benefit to construction, therefore, is improving the accuracy of forecasting and "what if" scenario planning. Because data on the Blockchain is widely accessible, changes made to the quantity or fabrication times of steel, for instance, could be instantly available to every relevant stakeholder including fabricators, haulers, materials managers, and construction teams.

This real-time access to changes in the project could democratize the change management process and open the way to the kind of collaboration that radically improves project cost and schedule.

## WHAT SHOULD YOUR ORGANIZATION'S NEXT STEPS BE?

Organizations that are interested in the possibility of trying Blockchain and smart contracts to reduce the costs and accelerate the schedules of their capital projects should explore the following questions:



### **Business Model Questions**

Is your organization competing on either supply chain or new building to such a degree that introducing Blockchain and smart contracts could hold big benefits? Are the potential gains of using this technology significant enough that they could merit seeking vendors that are already using it?



### **Supply Chain Questions**

How many of your existing vendors already use Blockchain and smart contracts? Are any of your capital projects large enough they might inspire your existing vendors to try it?



### **Other Questions**

How many processes and functions in your organization exist only to certify trust or facilitate workflow? Could Blockchain increase your organization's productivity not just at a project level, but a structural one? Are there any unique problems your organization is trying to solve that could be a good candidate for a test of Blockchain or smart contracts?

## MORE QUESTIONS?

If you have questions about using Blockchain or smart contracts on your construction projects, speak to one of Enstoa's experts. Call +1 (212) 913-0870 or [click here](#) to send us an email.