



Smart Contracts in Capital Projects

*The Data Gumbo and
PrairieDog Perspective*

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INTRODUCTION

In the capital projects industry—a sector that encompasses industrial, commercial and infrastructure projects and investments—there is significant informational and transactional friction. Every year, \$40 billion project dollars are wasted in the U.S. due to a lack of trust and discordance between participants.

Rife with confrontational relationships among stakeholders, siloed workflows that inhibit collaboration, and hefty administrative drag between the numerous layers of the supply chain, the built environment remains notoriously sluggish when it comes to capital efficiency and technology adoption. In comparison to other sectors like agriculture or manufacturing, both considered to be operating at Industry 4.0—using interconnected systems to communicate, analyze, and source data to inform better, smarter, real-world decisions—capital projects remain behind the times, a huge detriment to the financial viability of projects and the companies that participate in delivering them.

The industry must embrace healthier behaviors and innovative technologies to reduce transactional waste and make capital projects more financially viable while helping the companies that build them become more sustainable. Smart contracts backed by blockchain technology can improve cash flow, lower costs, and most importantly, provide a backbone of trust to radically improve collaboration and the current business model employed for capital projects.

“*Smart contracts provide a backbone of trust to radically improve collaboration and the current business model.*”

WHY TRANSACTIONAL WASTE IS A PROBLEM

As a significant contributor to the U.S. economy, the construction industry comprises 680,000 employers and 7 million employees that create an estimated \$1.3 trillion worth of structures each year. But, poor project performance is common—70% of projects are not completed within 10% of budgeted cost or schedule and 95% are not completed within 3% of budgeted cost or schedule.

The problem is even worse on megaprojects over \$1 billion where 98% experience cost overruns. But perhaps the most troubling fact is that on the average nonresidential capital project, 41% of the total installed cost is wasted on non-value-added transactions.

Prevailing contract models and late payments sustain numerous inefficiencies that increase the cost of capital, a major financial burden that impacts the entire project supply chain from suppliers to contractors to owners/operators. As an industry with notably thin margins and poor cash flow, most projects lack flexibility, predictability, capital efficiency, effective information sharing and other critical components necessary for sustainable and predictable returns on investment.





THE TECHNOLOGY: SMART CONTRACTS

Smart contracts powered by blockchain technology provide an innovative approach to streamline operations, improve visibility and transparency with accurate and current data, and empower counterparties to reduce inefficiencies and capture significant cost savings across the built environment.

Data Gumbo and PrairieDog’s smart contracts are essentially computer protocols that contain business logic designed to automate the performance of a construction contract of any type. With configurable conditions, counterparties can negotiate and agree on terms upfront, then the pre-agreed terms are linked to data sources like project execution tools, existing business management systems, project information management systems, integrated “nD” design/BIM models, sensors, GPS trackers, scanners, drones and other common home office and field data sources prevalent in industry.

Smart contracts can then trigger automatic pre-reconciled payments, as often as daily depending on how the contract language is structured. This means that contractors and suppliers get paid faster for services and products, thus freeing up working capital. It also means that owners/operators pay only for what actually is delivered or executed and much less for trade credit charges that currently sit within supply chain cost structures.

As transactions are executed, all relevant data and documentation required to verify or audit consensus is posted to immutable blocks in a distributed ledger that is viewable to all involved parties. GumboNet™, Data Gumbo’s interconnected blockchain network, is a distributed ledger that solves capital project pain points. As a neutral, third-party system, GumboNet creates a secure record of truth stored on a private, permissioned ledger system that leverages existing IT and data sources to digitally corroborate physical project events as they unfold in real-time.

Blockchain enables a shared, single source of truth for all financial and technical transactional information across capital project stakeholders. Beyond automating payments and decreasing Days Sales Outstanding (DSO) from the typical 60 to 120 days down to literally net one day, smart contracts eliminate manual and error-prone invoicing processes, minimize disputes and reconciliation burdens, and encourage higher productivity and quality. Across capital project life cycles, Data Gumbo and PrairieDog facilitate the transformation and modernization of industry from paper-based processes to a new digital operating model rooted in trust, collaboration, and cost efficiency.

FIELD SERVICES PAYMENT COMPARISON





HARNESSING THE MANY BENEFITS

Harnessing the power of blockchain-backed smart contracts, Data Gumbo and PrairieDog deliver a multitude of benefits including:

- **Removing transactional waste:** The capital project supply chain is hierarchical, fragmented and inefficient with multiple layers of markups consisting of wasteful protectionist dollars. Automated smart contracts can reduce capital expenditures (CAPEX) by up to 10% through a reduction in trade credit, one of the largest sources of transactional waste.
- **Reducing overhead costs:** Most manual invoicing processes leave approximately 5–8% of revenue on the table due to human error or poor change management practices. Smart contracts can eliminate errors at the source, capturing lost revenue. Moving from paper-based to digital automation can deliver a further 5–10% reduction in indirect work hours and overhead expenses pertaining to project accounting, project controls, finance, legal, A/P, A/R and auditing personnel.
- **Empowering owners to become a ‘client of choice’:** Getting paid quickly is of great importance to contractors, subcontractors, and suppliers, and the ability to do so can generate a magnet-like effect for owners, making them more attractive to the supply chain. A cost-efficient and trust-based project environment has benefits for the entire industry supporting improved productivity, schedule and quality, while yielding less stressful, more enjoyable projects.
- **Achieving lower billing rates:** Owners and developers typically can borrow money at more favorable rates than engineering or construction firms. By improving the velocity of cash flow throughout the project supply chain, smart contracts mutually verify that payable events have occurred and trigger automatic “micro” payments. When companies pay quickly instead of paying late, which essentially amounts to treating sub-tier contractors and suppliers as banks, they should expect to receive invoice discounts in the near term. Longer term, much larger savings will manifest in the form of reduced overhead markups and lower billing rates throughout the supply chain.
- **Delivering provenance of materials and services:** Blockchain technology is inherently suited to tracking vast amounts of information with its unalterable, real-time recording capabilities. For capital projects, this makes it particularly well-suited to tracing materials and services from project conception through commissioning and facility start-up. Blockchain can maintain immaculate records of all project information including engineering data, manufacturing and sourcing records, O&M manuals, etc. As an enabler of ‘digital twin,’ blockchain’s rich data environment supports smart assets and predictive analytic tools that can streamline turnarounds, maintenance and overall facility operations.



MOVING FORWARD WITH DATA GUMBO AND PRAIRIEDOG

Smart contracts and blockchain are foundational technologies for enabling the new, collaborative construction ecosystem of the future that is being developed by PrairieDog in collaboration with the Construction Industry Institute (CII), the Construction Users Roundtable (CURT) and other leading industry groups. These technologies are proven and can be implemented on capital projects today including application to any commercial arrangement such as T&M, cost-reimbursable, lump sum, unit rate, incentive-based, etc.

“ *These technologies are proven and can be implemented on capital projects today.* ”

Data Gumbo and PrairieDog can help build reusable libraries of smart contracts for a wide range of capital project applications. Available with little to no upfront costs or installations necessary, leveraging existing systems and tools is easy. Act now by contacting either Data Gumbo or PrairieDog, and start saving in approximately 90–120 days.

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