

WHITE PAPER



Utilizing IoT & Blockchain Technologies to Digitally Transform the Rental and Returnable Asset Industry



Billions of returnable transport items (RTIs) such as containers, bins, pallets, racks, and beer kegs move through the global supply chain, providing the most fundamental way in which parts, materials and finished goods reach their destination. At the same time, many enterprises are in the business of leasing and renting assets and equipment (e.g., furniture, porta-potties, horticultural racks, intermediate bulk containers) to companies who use these items for their operations, but prefer not to own them outright.

Organizations with large and complex supply chains may have millions of returnable or rental assets, representing billions of dollars in value. It is critical that these returnable and reusable assets be tracked and accounted for effectively so that their utilization can be optimized for the organizations to maximize their return-on-assets. Manufacturers impose penalties on distributors for not returning RTIs or demand deposits on RTIs which are only refunded upon return, while asset rental businesses charge customers based on actual usage.

Building Trust, Delivering Authentication, & Managing Complex Supply Chains

THE PROBLEM

When organizations lack visibility into their returnable or rental assets throughout the supply chain, it creates considerable productivity, labor, financial, and customer service inefficiencies including:

- *Longer cycle times*
- *Fleet shrinkage*
- *Hoarding*
- *Supply chain bottlenecks*
- *Inefficient product recalls*
- *Delayed orders*
- *Inaccurate shipments*
- *Under-billing and disputed invoices for asset usage, storage or detention*



THE CHALLENGE

Unfortunately, companies face numerous obstacles that can prevent them from getting the details they need to properly manage a reusable or rental asset fleet. Furthermore, many organizations lack even the basic ability to gain insight into the size of their fleet itself, causing the extent of their asset management problems to compound.

- *Inappropriate and/or unreliable tracking*
- *Extending supply chains and globalization*
- *Manual processes and errors*
- *Labor and time shortages*
- *Unverified arrival and departure records*
- *Loss of external visibility and control*

Companies often try to “solve the problem” by purchasing and carrying additional returnable assets to prevent shortage, increasing the labor and/or hours associated with inventorying, tracking and managing the assets, and hiring extra customer support resources for inefficient service processes (product recalls, inaccurate shipments, etc.). However, throwing additional resources at the problems only serves as a temporary, bandage approach to ensure continued efficient operations of the supply chain. Gaining more automated returnable asset visibility and increasing the sharing of information throughout the supply chain are the only way to address the root of the business challenge to maximize the return on asset investment.



BLOCKCHAIN 101

The 2 main tenants of blockchain technologies

Distributed Ledgers

A Distributed Ledger builds trust and reduces cost through immutable records visible to “everyone” without requiring a central point of control in real-time. Blockchain-based distributed ledger technologies serve as a natural way to allow supply chain partners to commit IIoT-driven asset transactions, and share an immutable and common view of the history of asset accountability and conditions. Permissioned blockchain (e.g., Hyperledger Fabric) is particularly appropriate for supply chain applications as it allows trusted parties to control the extent of sharing to be allowed to trusted parties. At the same time, automation of transactions through IIoT ensures the quality of transaction data and truly unlock the value of blockchain technologies for supply chain management.

Smart Contracts

Smart Contracts accelerate transactions through distributed execution of business logic associated to any object/asset of value in blockchain. In returnable and rental asset management, execution of shared business agreements such as settlement of asset deposits or rental fees may be implemented as smart contracts and executed as asset accountability changes. For example, smart contracts may automatically adjust assignment of assets to proper party upon IIoT-driven proof-of-delivery/transfer or digitally signed mobile transactions to ensure proper demurrage and invoicing. For RTI operations implementing a deposit-refund model (e.g., Brewery, Rental Equipment), the smart contract can automatically reconcile deposits and execute refund transactions.

Blockchain makes it possible to build applications where multiple parties can execute transactions without the need for a trusted, central authority. Today, building a scalable blockchain network with existing technologies is complex to set up and hard to manage. To create a blockchain network, each network member needs to manually provision hardware, install software, create and manage certificates for access control, and configure networking components. Once the blockchain network is running, you need to continuously monitor the infrastructure and adapt to changes, such as an increase in transaction requests, or new members joining or leaving the network.



**Amazon Managed
Blockchain**

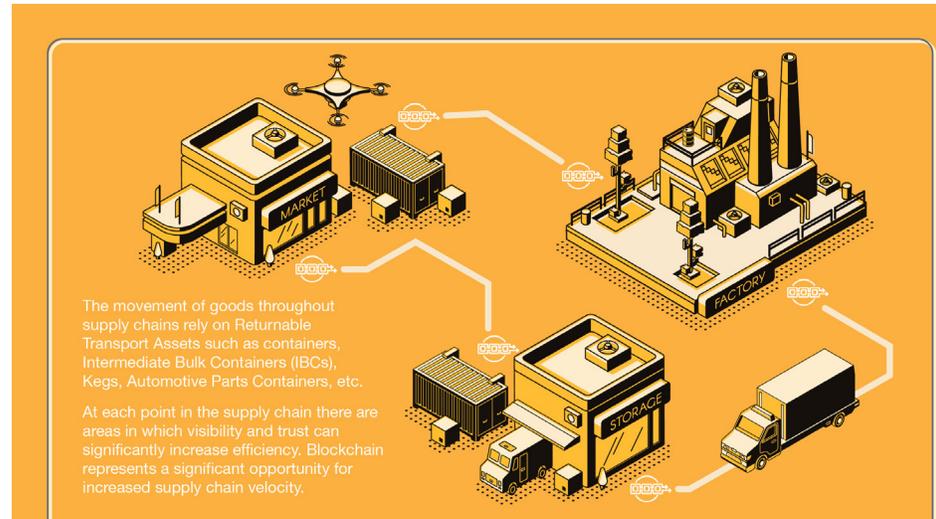
Amazon Managed Blockchain is a fully managed service that allows you to set up and manage a scalable blockchain network with just a few clicks. Amazon Managed Blockchain eliminates the overhead required to create the network, and automatically scales to meet the demands of thousands of applications running millions of transactions. Once your network is up and running, Amazon Managed Blockchain makes it easy to manage and maintain your blockchain network. It manages your certificates and lets you easily invite new members to join the network.



THE SOLUTION

TrackX's GAME (Global Asset Management for Enterprises) platform is a turnkey asset tracking and management solution that includes software that utilizes data from IoT and auto-identification devices (RFID, GPS, BLE, sensors, cameras) to provide real-time visibility and control of all high-value and/or mission-critical assets and produce meaningful intelligence for the optimization of business processes.

Specific asset, product, location, organization, work task, order, and other transaction information can be configured to match customer needs to maintain a full audit trail of IoT events and asset handling details, while workflows, alerts, management dashboard, and reports can be configured and scheduled so that the right people have the right information at the right time.



Utilizing Amazon Managed Blockchain (AMB) all asset information is added to a distributed ledger building trust and reducing cost through immutable real-time records visible to “everyone” without requiring a central point of control. IoT technologies automate accurate tracking of returnable and rental assets and the distributed ledger serves as a natural way to allow supply chain partners to share an immutable and common view of the history of asset accountability and conditions. Permissioned blockchain (e.g., Hyperledger Fabric) is particularly appropriate for supply chain applications as it allows trusted parties to control the extent of sharing to be allowed to trusted parties. At the same time, automation of transactions through IoT ensures quality transaction data and truly unlocks the value of blockchain technologies for supply chain management.

The solution also utilizes smart contracts to accelerate transactions through distributed execution of business logic associated to any asset of value being managed. In returnable and rental asset management, execution of shared business agreements such as settlement of asset deposits or rental fees may be implemented as smart contracts and executed as asset accountability changes. For example, smart contracts may automatically adjust assignment of assets upon IoT-driven proof-of-delivery or digitally signed mobile transactions to ensure proper invoicing.



USE CASE: RENTAL POOLING SYSTEM

A supply chain of over 40,000 farmers, over 50 distributors, and hundreds of retailers share over 1,000,000 standardized horticultural racks to transport a variety of plants across the United States

TrackX provides a solution to maintain real-time inventory, status, and location of all shipping assets for its customer which provides Returnable Transport Packaging to the horticultural industry. This pool system is one in which standardized horticultural racks for shipping plants are all used by numerous partners to send goods throughout the supply chain.

Each of these racks has been outfitted with an active RFID tag that can be read from distances of up to 100 meters. As these racks make their way from a farmer's field, to a distribution location, and ultimately to a retail location such as Home Depot, the TrackX solution utilizes advanced analytics and workflows to automatically update the system with current location, availability, and ownership status. This allows the customer to have accurate real-time information regarding their fleet leading to increased usage and accurate billing.

With the solution in place tracking and managing all assets in real-time, the next logical step is to allow all supply chain constituents to have access to inventory levels (with location and status information) which can lead to better shipping planning and reduced cost for transportation of racks. Allowing each member of the network to gain visibility will ultimately lead to increased usage and revenue to the pool management company.

But, there is still much work to be done manually by the finance team to make certain that invoices are accurate, timely, and in many cases followed up on to get paid. With a fully transparent supply chain that is blockchain enabled, each network participant can be confident in the availability and accuracy of their inventory at any given time. Once trust is established, smart contracts can be used to further digitize the supply chain and reduce the need for invoicing and instead utilize these automatically executing smart contracts for financial transactions further streamlining the entire organization.

THE CHALLENGES

- Expansive and complex supply chain
- Maintaining sufficient inventory of horticultural racks
- Supply chain constituent accountability
- Financial responsibility and accounts receivable

CONNECT WITH US

