



Blockchain-enabled systems for asset lifecycle management in the Oil & Gas industry

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What is Blockchain?

Technology
Powers all ~20k cryptocurrency - BTC, ETH, DOGE
81 of the top 100 companies worldwide
COKE, HONEYWELL, PFIZER, WMT

Network	Operating System	Database (like)	Digital Security
<ul style="list-style-type: none"> Moves data securely at internet speed Reliable, efficient, secure 	<ul style="list-style-type: none"> Build executable Smart Contracts ML, AI 	<ul style="list-style-type: none"> Distributed ledger Records every transaction Manages data 	<ul style="list-style-type: none"> AES 256-bit encryption Indisputable, Immutable

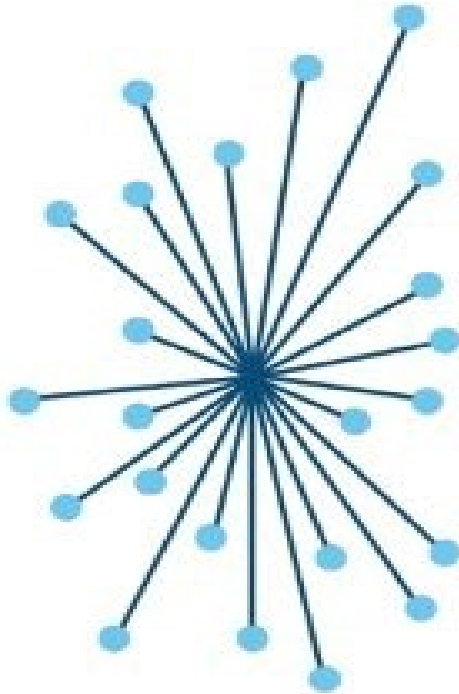
Store - value of anything, tangible (house, car) or intangible (loans, IP, carbon credit)
Trade – that value for anything of value
Track – that value as a digital asset
Build – ETH first with smart contracts

Smart Contracts
AI, acting as a legal contract holder and legal executor as Lawyer, Bank

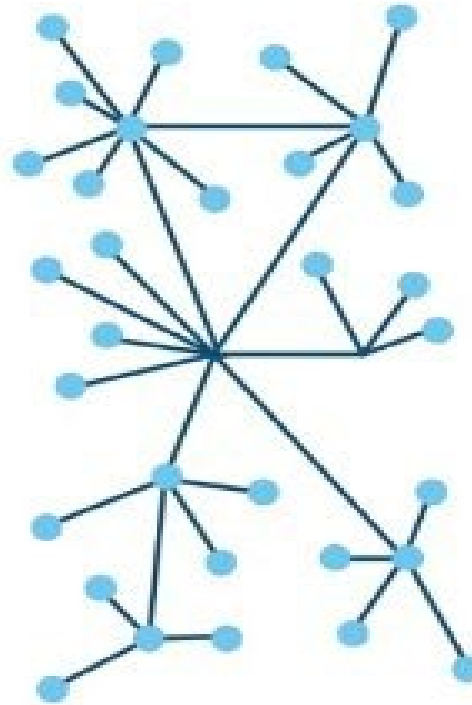
- Asset management
- Supply chain

Distributed Network – the basics

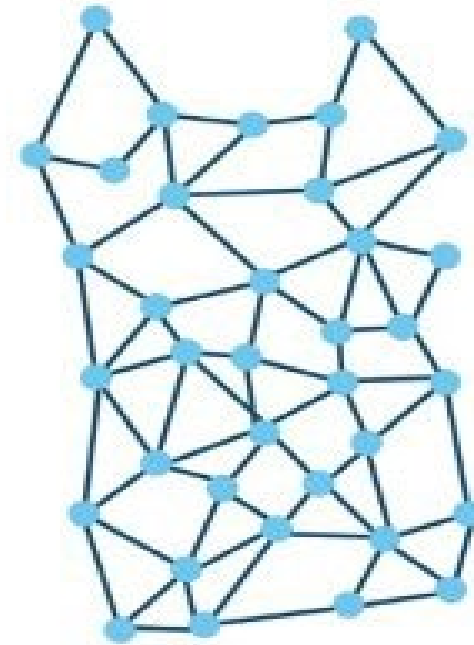
Not so secret sauce



Centralized



Decentralized

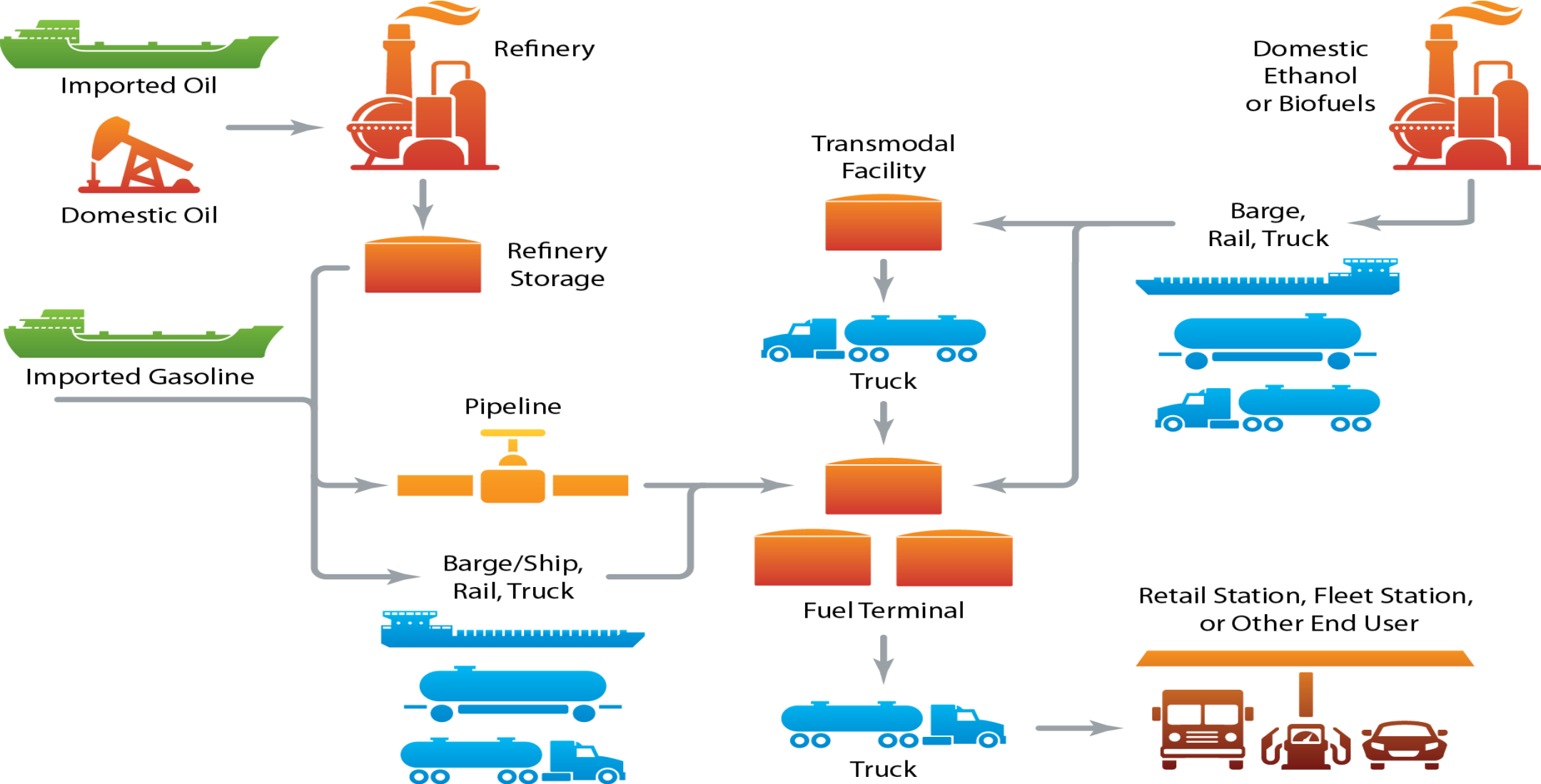


Distributed

Data management - the basics

Properties	Database	Blockchain
Authority	Centralized, controlled by a single entity	Decentralized amongst many nodes (stakeholders)
Architecture	Client-Server Architecture	Distributed Ledger Network
Data-handling	All data resides in the DB - Read, Write, Update, and Delete	All data is stored on the node - Read and Write Operations Only
Transparency	Administrators control level of access	Fully transparent
Security/Integrity	Malicious actors can alter integrity of data	Cryptographically impossible to fake or manipulate

Oil & Gas supply chain/ asset management network



Common Oil & Gas supply chain complications

Bad Data/ Must Trust - Silos

- equipment performance
- geospatial information
- constant struggle to make sense of the vast amount of information available
- draw the wrong conclusions



Documentation Issues

- customer records and financial data all need to be analyzed
- typically incomplete, complex, and difficult
- international requirements (cross border)
- land and title registries are currently extremely manual, difficult to navigate due to extensive use of paper, forgery risk

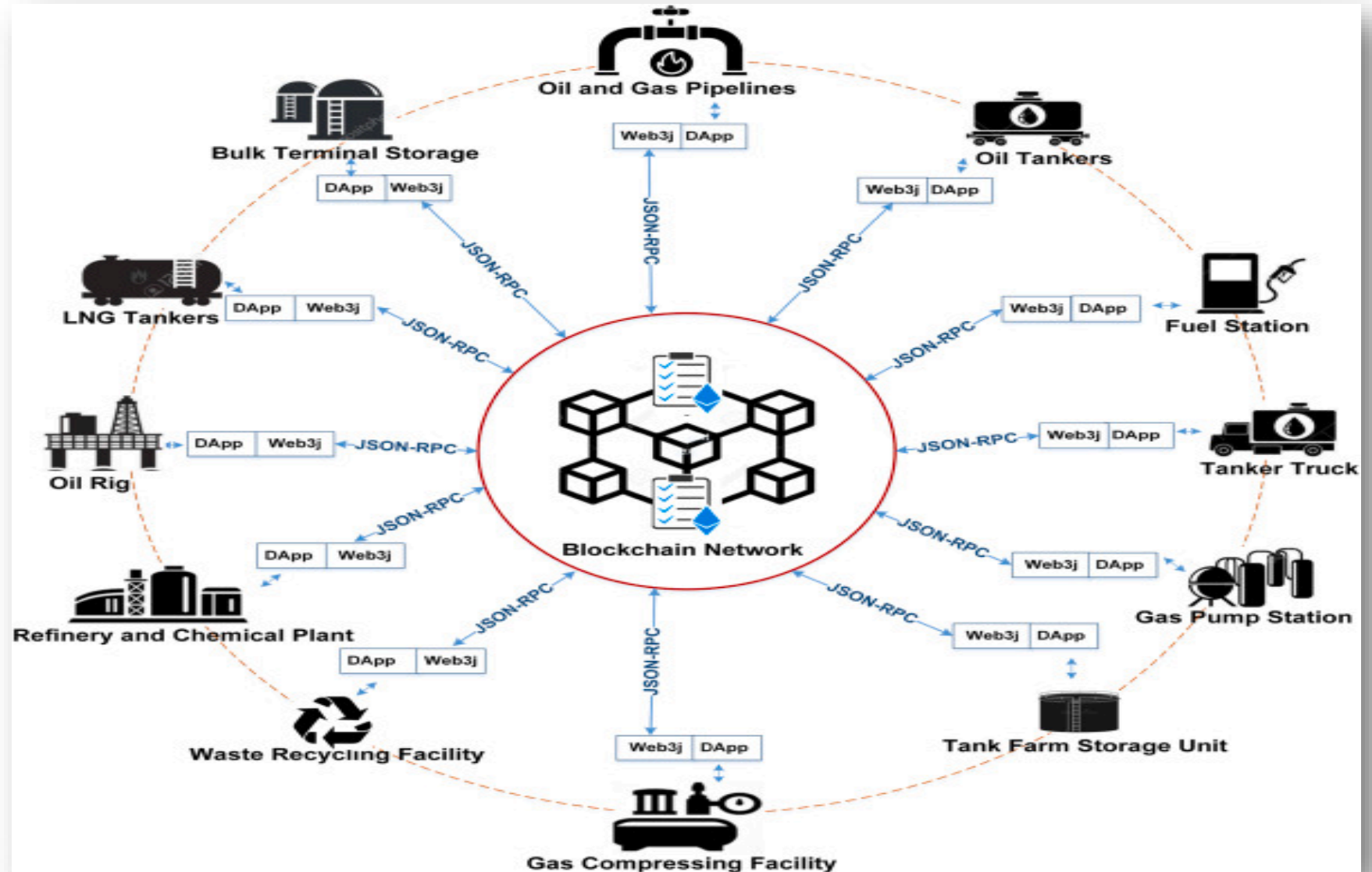


Manual Process

- asset management
- trading and movement of physical products
- validate agreements, contracts, often across multiple platforms

Same supply chain now on a Blockchain network

- Still following the same supply chain but now everything is recorded, all pertinent data stored from **EVERY STAKEHOLDER, EVERY STEP ALONG THE WAY**
- Anything an IOT device can record is stored (temperature, chemical composition, all paperwork, IDs, etc.) is written to the blockchain - timestamped, shared, immutable, **TRUSTED**
- One source of truth, all workers and documents are validated and verified, payments can be made **INSTANTLY, DIRECTLY**
- Now provide all information, all data, any disruption or any effect on any energy asset in the supply chain can be reported and trusted **IN REAL TIME**



IoT and blockchain-enabled shipment

Real examples



All distribution terminals' logistics steps written to blockchain such as blending gasoline with ethanol

We can know instantly if imported crude oil are affected whenever U.S. ports are closed



All drivers' paperwork verified - names, pickup & delivery times

Real-time MCI – location or temperature disruptions, anything that can affect the availability of gasoline supply



Flow both ways, all stakeholders have receiver's information, shipment acceptance and administration time

- No payment reconciliation
- No disputes removing human-error and potential tampering

Origin

Shipping

Destination



Brings all transactions, documentation, authorizations together



Role Based Access Control for Customized Governance



Fully Integrable with Existing Systems; No Rip & Replace Necessary

Key Features



End-to-End Visibility and Tracking

Decentralized, all-encompassing ledger provides increased transparency and end-to-end tracking



Immutable Track Record Provides Auditability

Records are permanent and cannot be changed by nature of the design, reducing the risk of forgery



Increased Security

Eliminates possibility of altering records and falsifying history or tampering with equipment



Consolidated, Streamlined System

Single distributed ledger used as the system of record greatly reduces disparities between existing systems



Improve Trend and Failure Analysis

Easily accessible database for use of AI, machine learning, and pattern recognition



Instantaneous Reporting

Complete records of individual objects can be quickly called up, reviewed and documented.

Opportunities for oil & gas

TRUST

throughout the value chain of data and partners.


TRANSPARENCY

over product, processes, certifications, etc.

EFFICIENCY

of processes, audits, compliance, vendor mgmt.

- Crude Oil Track & Trace
- Cross-Border Chain-of-Custody (Safety Certificate Storage)
- Oilfield Asset Management
- Digitization of Crude Oil Transactions, one currency
- ESG / Carbon Credit administration, management and trade



resilient, relevant and sustainable supply chain



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History

- Stockbroker, VC
- Technology Background - Web hosting, Storage, SCM/ ERP, Blockchain
- PsyD, Organizational Management

Current

- Blockchain Supply Chain Sales - WaveDancer
- Certified Blockchain Consultant
- Certified Cryptocurrency Trader

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