PIDX Coordination with the new Oil & Gas Blockchain Forum

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What is Blockchain?

No single ownership, multiple contributors, no 3rd parties

A **distributed ledger** which allows **digital assets** to be transacted in real-time, immutable manner

Digital asset: something represented in a digital form that has an intrinsic or acquired value e.g. land, house, currency, vote, goods, certificates, identity, rewards

Transparent, secure, irreversible

Low Friction

Near real-time settlement of recorded transactions

Verifiable

Digital representation without the ability to delete or modify for every transaction

PIDX™ INTERNATIONAL
The place to go for
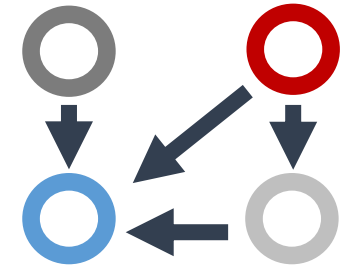oil and gas e-business standards

When to Use Blockchain?

5 KEY REQUIREMENTS, WHEN MET IN PART OR FULL, INDICATE THAT BLOCKCHAIN MAY BE A SOLUTION

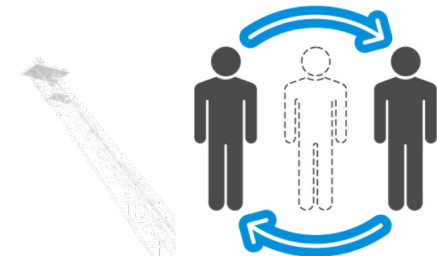**Shared data?**

More than one participant?

Transaction dependency?

Absence of trust?

Blockchain

May Be A Solution

Opportunity for disintermediation?

Benefits of Blockchain

PIDX INTERNATIONAL
The place to go for oil and gas e-business standards

- Cryptography combined with logic enables trust

- Master data management is executed without a controlling entity

- Universal data loss becomes a lesser issue

- Resilience is achieved through replication across dispersed architecture

- Time stamped events are agreed upon across multiple entities

- Secure encryption and verification technologies enable secure sharing of information

- Digital signatures provide authenticity and non-repudiation

- End-to-end asset lifecycles including ownership and custody can be tracked

PROGRAMMABLE LOGIC
TIME STAMPING
DATA MANAGEMENT
SECURITY
DATA LOSS PROTECTION
AUTHENTICITY
RESILIENCE
B2B OWNERSHIP

FASTER REAL-TIME PROCESSING   **DISPUTE/ERROR REDUCTIONS**   **COST SAVINGS**   **MORE ANALYTIC DATA**

Barriers To Widespread Adoption

Technical

- Scalability limitations
- Lack of integration libraries
- Lack of technical standards
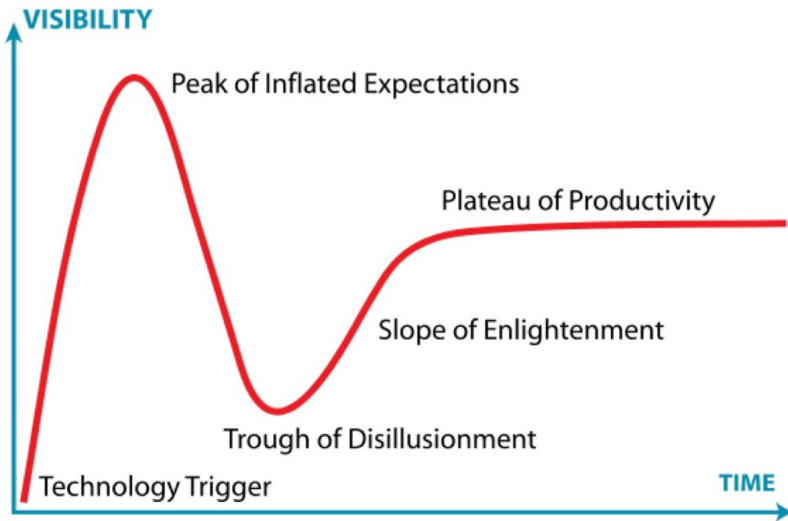- Limited developer tools
- Performance issues

Business

- Regulatory environment (lagging the pace of innovation)
- Lack of common process standards and best practices
- Existing intermediaries resistance
- Privacy concerns
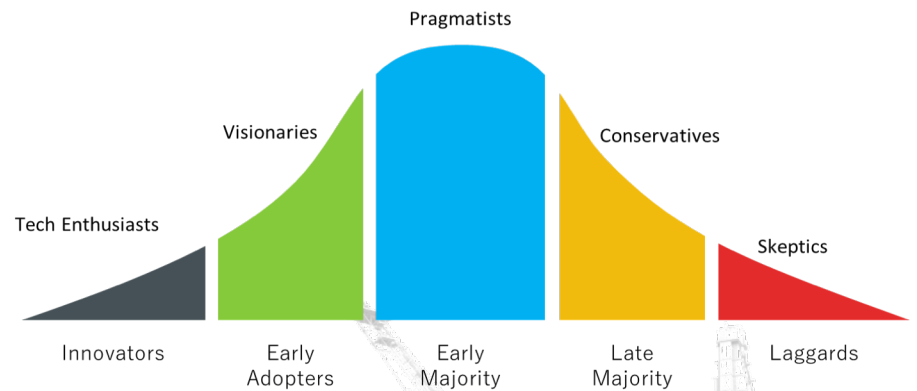- Negative perceptions created by cryptocurrencies

Why Blockchain Now?

Gartner Hype Cycle

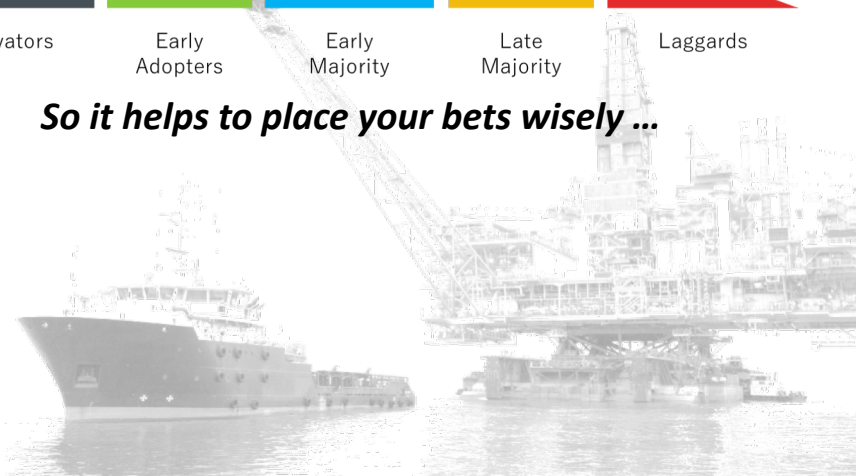*Emerging Technologies can be hard to predict...*

Product Adoption Curve

So it helps to place your bets wisely ...

But blockchain seems likely to be a winning technology, with the time-to-value and appropriate application targets being the primary questions

U.S. Oil & Gas Operator Blockchain Forum

EQT
Southwest Energy
A Southwest Energy / Dedo Joint Venture
devon
Anadarko
ConocoPhillips
noble energy
Marathon Oil
bp
Apache
PHILLIPS 66
MOTIVA
Chevron
HESS
equinor
FOUNDER
Shell
CALIFORNIA RESOURCES CORPORATION
eog resources
OXY
MP2 ENERGY
ExxonMobil
Energy lives here

WITH MORE JOINING...

Purpose of the Forum: *Learn, lead and leverage blockchain technology, to improve operational efficiencies, further automation, and reduce overall costs*
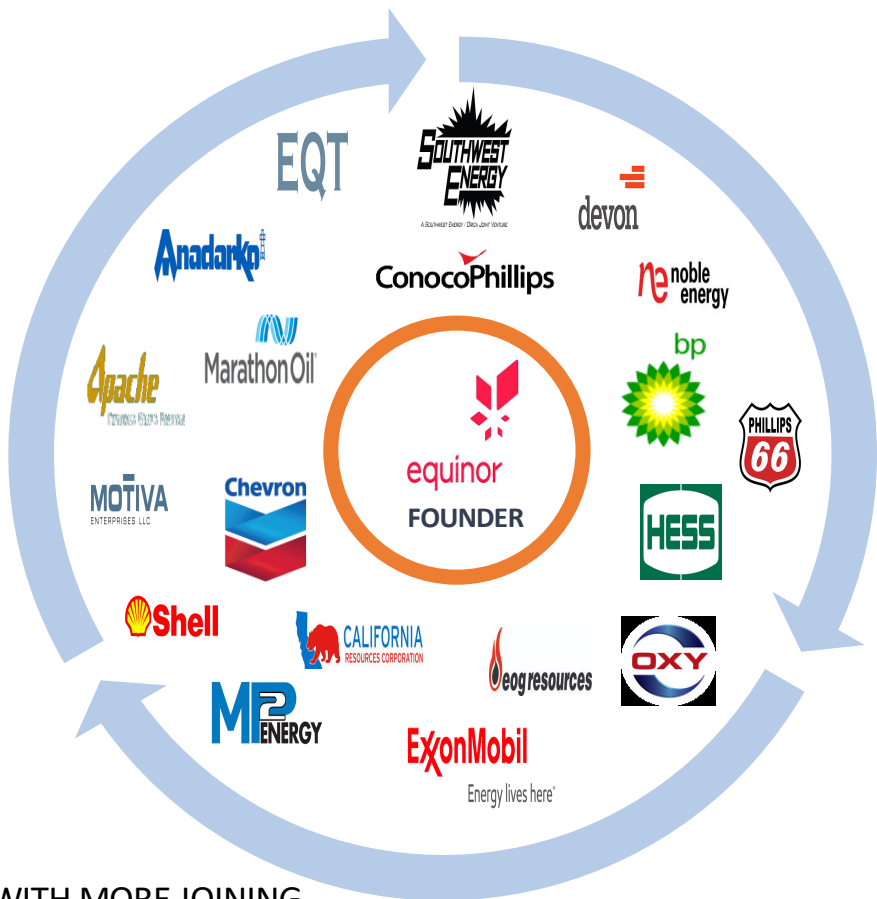
Key Objectives

- Build blockchain technology and provider understanding
- Explore and assess industry wide use cases
- Develop operator-led standards for blockchain adoption
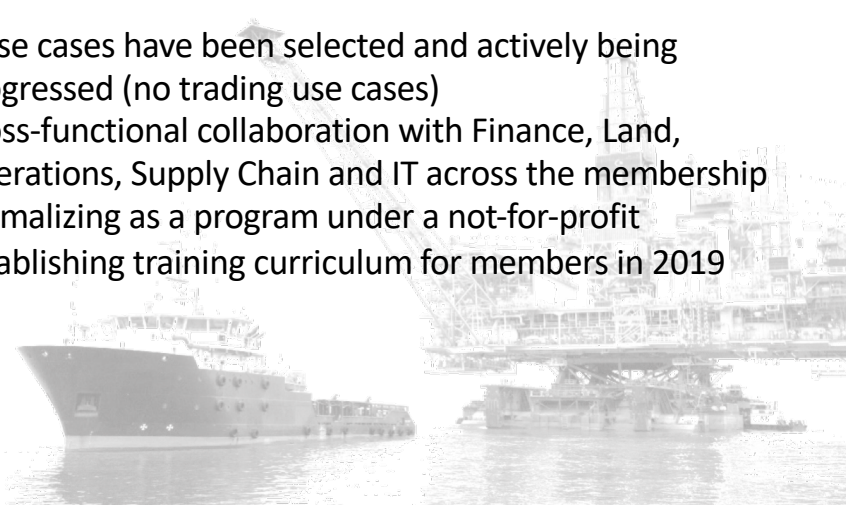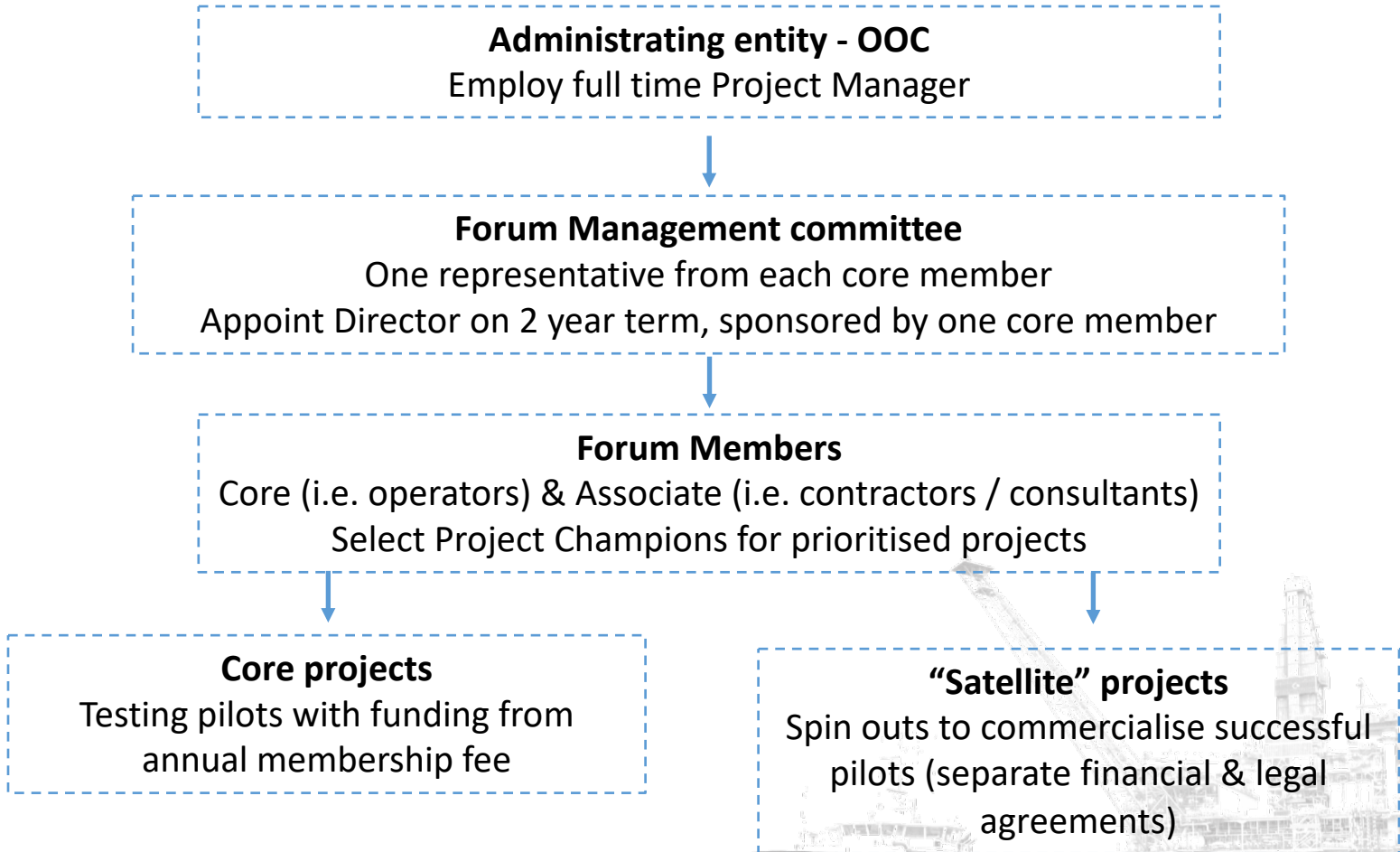
Current Status and Focus

- 3 use cases have been selected and actively being progressed (no trading use cases)
- Cross-functional collaboration with Finance, Land, Operations, Supply Chain and IT across the membership
- Formalizing as a program under a not-for-profit
- Establishing training curriculum for members in 2019

Proposed Forum Structure

Administrating entity - OOC
Employ full time Project Manager

Forum Management committee
One representative from each core member
Appoint Director on 2 year term, sponsored by one core member

Forum Members
Core (i.e. operators) & Associate (i.e. contractors / consultants)
Select Project Champions for prioritised projects

Core projects
Testing pilots with funding from annual membership fee

"Satellite" projects
Spin outs to commercialise successful pilots (separate financial & legal agreements)

OOC = Offshore Operator Committee

How the Forum Will Assess Use Cases*

- Fee based membership per calendar year
- 2-tier membership: Full Members and Associate Members

Membership-Based Organization

Management Committee

- Approves Core projects and funding distribution per year
- Ratifies Satellite projects but no funding is allocated

- Members participating in either a Core or Satellite project will enter a consortium agreement defining future operations

Consortiums Formed

CORE PROJECT

Individual project that is approved by the Management Committee, co-developed by all Core members, and funded entirely with resources from the annual membership fee

SATELLITE PROJECT

A separate project that originates from a member or spins out of the U.S. Oil & Gas Blockchain Forum program from a single/group of Core members that wishes to execute and fund outside of the annual membership fees

* Draft approach subject to finalization of membership agreement.
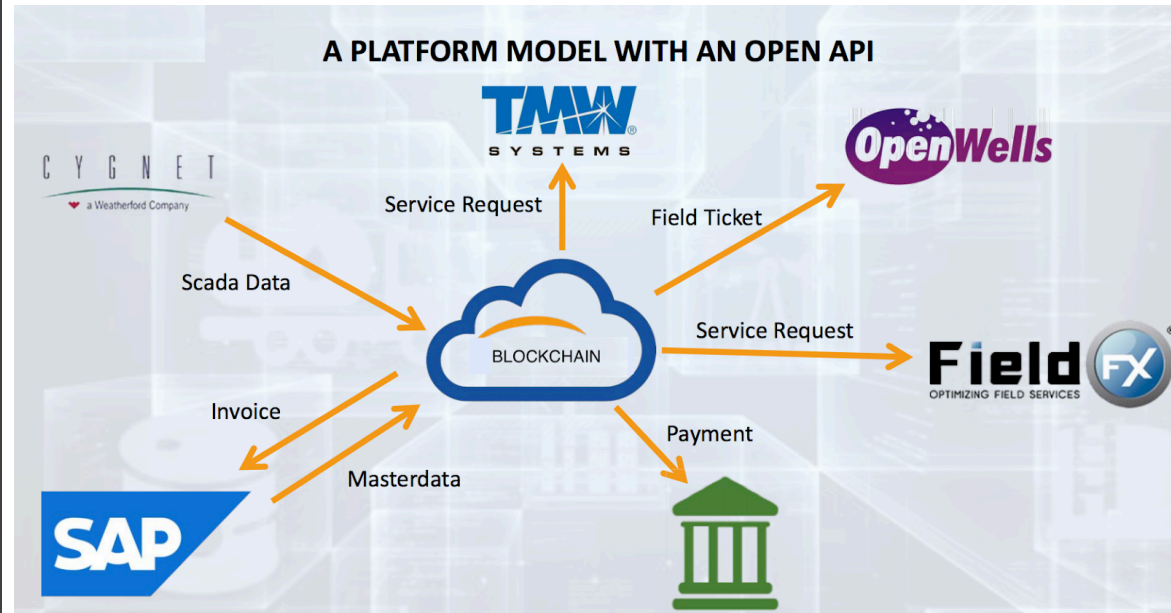
Truck Ticketing

Problem
- Error Prone
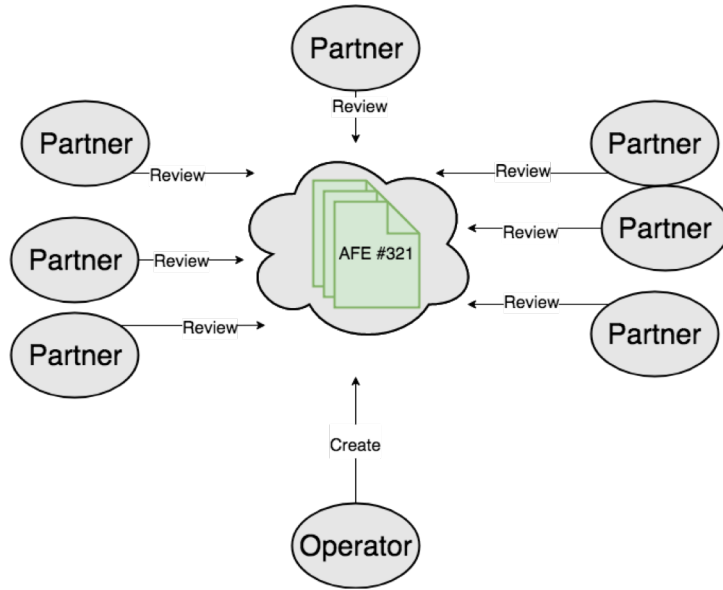- Paper Based Process
- Low Transparancy
- Difficult Auditing

Solution – Digital Ticket
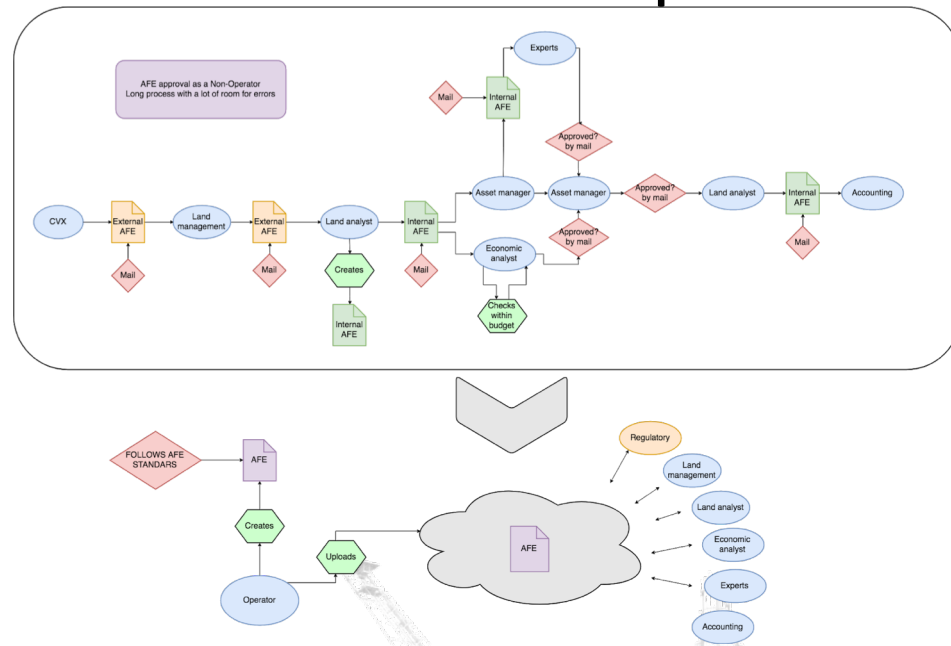- Automation
- Increased Security
- Transparency
- Direct Audit

A PLATFORM MODEL WITH AN OPEN API

AFE Pooling

External – between partners

Internal – for non-ops

Problem: Error Prone Paper-Based Process
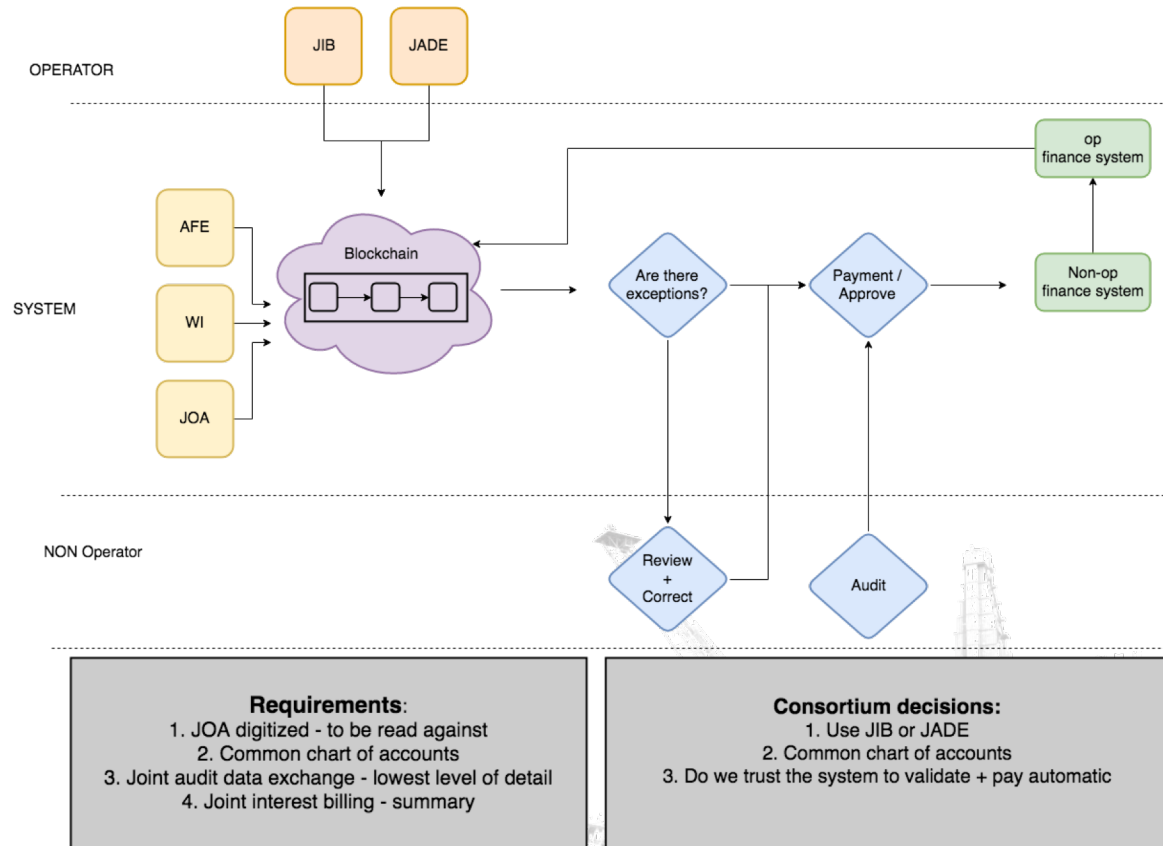Solution: Transparent And Secure AFE Pooling

Joint Interest Billing (JIB) Exchange

❖ Problem
- Audit Adjustment
- Prior Period Adjustment
- Disputes
- JIB-AFE Mapping Lacking

❖ Solution – Transparent Billings
- Integration
- Less Error Prone
- Minimal Audits
- Improved Capital Reporting

OPERATOR: JIB, JADE

SYSTEM: AFE, WI, JOA → Blockchain → Are there exceptions? → Payment / Approve → Non-op finance system / op finance system

NON Operator: Review + Correct, Audit

Requirements:
1. JOA digitized - to be read against
2. Common chart of accounts
3. Joint audit data exchange - lowest level of detail
4. Joint interest billing - summary

Consortium decisions:
1. Use JIB or JADE
2. Common chart of accounts
3. Do we trust the system to validate + pay automatic

- ❖ Blockchain Forum will leverage other non-profits for expertise
- ❖ Likely that data standards will need to be produced, maintained, and IP protected
- ❖ PIDX already has an electronic field ticketing workgroup that seems a natural leverage point
- ❖ PIDX has a JIB EDI standard that could be refreshed/leveraged
- ❖ Other efforts may leverage PIDX if a more appropriate alternate non-profit does not exist

How To Engage

❖ Directly via Blockchain Forum
- Operators only for now (contact: Rebecca Hoffman at Equinor via LinkedIn to join)
- Others can join once formal structure in place

❖ Via PIDX work groups
- Electronic Field Ticket work group (Contact: James Thompson at ConocoPhillips on PIDX web site page for Field Ticketing)