



Blockchain, Crypto Economy & NFTs

FS 2026

After this mini-lecture you will be able to:

- Apply the 5-question framework to evaluate enterprise blockchain use cases
- Cite ROI evidence from Walmart Food Trust, Kinexys, Contour, and TradeLens
- Build a simple TCO break-even model
- Identify governance failure as the primary cause of enterprise blockchain collapse

The central question

“Does blockchain do this *better* than a well-designed shared database, at acceptable cost?”

If you cannot answer yes, use a database.

Full 45-min lecture: 20260508_0930_enterprise_blockchain_roi.pdf

The 5-Question Decision Framework

Ask:

- 1 **Multiple parties?** Single org = use a database
- 2 **Shared truth required?** Do parties reconcile inconsistent records today?
- 3 **Intermediary to remove?** Is a trusted third party extracting rent?
- 4 **Immutability critical?** Would an audit-trail guarantee change behaviour?
- 5 **Tokenisation benefit?** Would programmable value transfer create new revenue?

Rule: ≥ 3 “Yes” answers \Rightarrow blockchain justified. < 3 “Yes” \Rightarrow use a shared database.

Enterprise Blockchain Use-Case Fit Matrix

	Multiple Parties?	Shared Truth Needed?	Intermediary to Remove?	Immutability Critical?	Tokenisation Benefit?
Single-org Database	No	No	No	No	No
Internal Accounting	No	Partial	No	No	No
Cross-border Payments	Yes	Yes	Yes	Partial	Yes
Trade Finance Letters of Credit	Yes	Yes	Yes	Yes	Partial
Supply Chain Provenance	Yes	Yes	Partial	Yes	Partial
Repo Settlement (Kinexys)	Yes	Yes	Yes	Yes	Yes

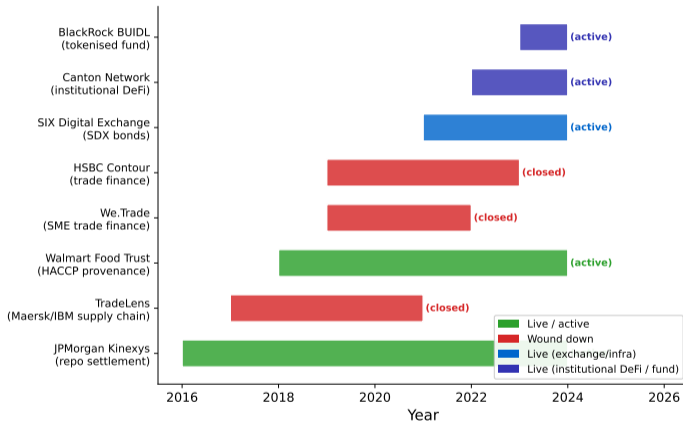
Legend: ■ Yes - strong fit ■ Partial fit ■ No - weak / no fit

Rule of thumb: need 3+ “Yes” answers to justify blockchain over a shared database.

Wust & Gervais (2018): “Do you need a Blockchain?”, the canonical decision framework. Single-org use cases consistently score below the threshold.

Enterprise Blockchain: Project Timeline & Outcomes

Enterprise Blockchain Projects: Launch, Evolution & Outcome (2016-2024)



Note: TradeLens wound down Dec 2022. HSBC Contour wound down Nov 2023. Kinexys (formerly Onyx) active with \$1B+ daily repo settlement volume.

TradeLens wound down Dec 2022. HSBC Contour wound down Nov 2023. Kinexys (\$1B+/day) and Walmart Food Trust remain operational.

Walmart Food Trust (2018 pilot benchmark):

- Triggered by 2018 US E. coli outbreak (romaine lettuce)
- IBM Food Trust on Hyperledger Fabric
- Traceability: **6.5 days** → **2.2 seconds** (2018 pilot benchmark)
- Walmart mandated all leafy-green suppliers join (Sept 2019)
- Honest caveat: 2.2s is pilot figure, not production average; IBM Food Trust discontinued standalone 2023

JPMorgan Kinexys (formerly Onyx):

- **\$1B+ daily repo settlement** (2024)
- Intraday repo: impossible in traditional market (closes 3pm)
- Counterparties: BlackRock, Barclays, BNY Mellon
- Private Ethereum; permissioned; FINMA/regulators visible
- All 5 framework criteria: Yes

Pattern: narrow scope + quantifiable ROI + neutral governance.

Walmart 2018 pilot benchmark is the canonical enterprise blockchain ROI figure. Kinexys is the largest-volume live enterprise deployment.

TradeLens (2018-2022):

- Maersk + IBM; global shipping documentation
- Investment: press-reported figures in the range of \$1.6B+ (estimate; not fully disclosed)
- Wound down December 2022: “not commercially viable”

Root cause: Maersk as co-operator; rival carriers (CMA CGM, MSC) refused to share data with a competitor. *Governance failure, not technology failure.*

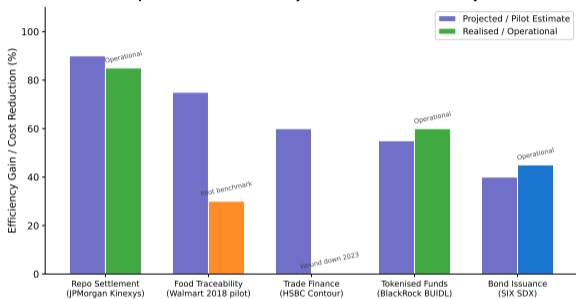
HSBC Contour (2019-2023):

- HSBC, StanChart, ING, Citi; Letters of Credit on R3 Corda
- Claimed: 90% LC processing time reduction in pilots
- Wound down November 2023

Root cause: LC market declining (~5%/year). SWIFT gpi also improving speed. Non-bank participants (importers/exporters) never onboarded. *Business-model failure in a declining market.*

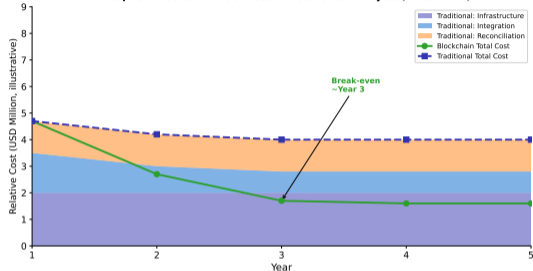
34% of enterprise blockchain consortium failures are due to governance disputes. Technology worked in both TradeLens and Contour; the business model failed.

Enterprise Blockchain ROI: Projected vs. Realised Efficiency Gains



Note: Figures are approximate estimates from public disclosures and press reports. Contour wound down Nov 2023 before full ROI realisation. Walmart figure = 2018 pilot benchmark (traceability time from days to 2.2 s).

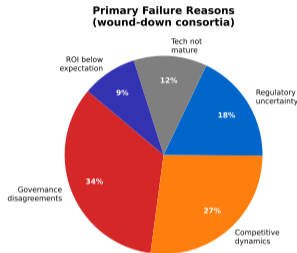
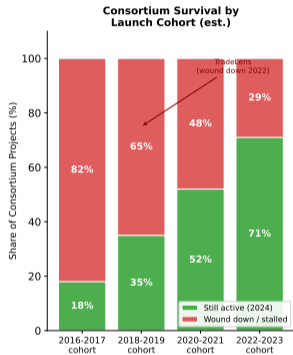
Enterprise Blockchain TCO Model: Break-even Analysis (Illustrative)



Note: Illustrative model. Blockchain shows high Year-1 integration cost; savings from eliminated reconciliation emerge Year 3+. Actual numbers depend on consortium size, transaction volume, and infrastructure choices.

Pilot benchmarks overstate production ROI. TCO break-even typically at Year 3-4. Multiply initial dev estimate by 3x to get realistic 5-year TCO.

Consortium Survival & Governance Lessons



Governance checklist for viability:

- ✓ Neutral operator (not a competing member)
- ✓ Weighted voting (not 1-member-1-vote)
- ✓ Pre-agreed data portability (exit plan)
- ✓ Usage-fee funding (not upfront capital calls)
- ✓ Regulatory pre-approval (sandbox)

Success formula:

Narrow scope + neutral governance + quantifiable ROI

Note: Survival estimates based on Gartner, McKinsey, and press-reported consortium outcomes 2016-2024. Cohort survival improves as later cohorts had more realistic scopes and governance frameworks.

Later cohorts survive at higher rates as projects learn from earlier failures and adopt realistic governance frameworks.

The decision framework:

- Blockchain justified when ≥ 3 of 5 criteria are “Yes”
- Single-org, internal, or declining-market use cases: use a database
- Apply $3\times$ TCO multiplier to initial dev estimate
- Break-even typically Year 3-4

Case study verdicts:

- Walmart (2018 pilot): genuine ROI in narrow scope
- Kinexys: \$1B+/day; largest live enterprise success
- TradeLens: governance failure (press-reported \$1.6B+ wound down 2022)
- Contour: business-model failure (wound down 2023)
- SDX: single operator + FINMA licence = success model

Architecture choices:

- Permissioned: control + privacy (Kinexys, SDX)
- Permissionless + KYC: composability + compliance (BUIDL)
- Hybrid (converging): Canton Network, SWIFT interoperability

Governance is the critical variable:

- 34% of failures = governance disputes
- Technology worked in TradeLens and Contour
- The blockchain is only as good as its governance model

Enterprise blockchain is maturing, not dead. The survivors share one trait: they solve one specific pain point rather than trying to blockchain-ify an entire industry.

Success Formula: What Separates Winners from Losers

Three necessary conditions for survival:

- **Narrow scope:** one use case, measurable ROI from day one (not “blockchain for everything”)
- **Neutral governance:** operator has no competing commercial interest among consortium peers
- **Regulatory clarity:** framework exists or sandbox licence secured before launch

Pattern match:

- Kinexys: 3/3; \$1B+/day active
- SDX: 3/3; FINMA-licenced, active
- TradeLens: 1/3; closed Dec 2022
- Contour: 1/3; closed Nov 2023

Avoiding “blockchain theatre”:

- Ask: would a shared database achieve the same outcome at lower cost?
- If yes: do not deploy blockchain
- If no: apply the 5-question framework to confirm

TCO reality check:

- Multiply dev estimate by 3× for 5-year TCO
- Break-even: Year 3–4 for well-scoped projects
- Year 1 governance costs are the biggest surprise

Enterprise blockchain is not dead: it is maturing. The 18% survival rate of 2016–2017 cohort projects reflects early hype, not the technology’s ultimate potential.

Quiz: Enterprise Blockchain ROI (1/2)

Q1. How many “Yes” answers to the 5-question framework are needed to justify blockchain over a shared database?

- A) 1 B) 2 C) 3+ D) All 5

Quiz: Enterprise Blockchain ROI (1/2)

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Answer: C: Three or more “Yes” answers indicate blockchain likely adds genuine value.

Q2. What was the traceability time improvement measured in the Walmart Food Trust **2018 pilot benchmark**?

A) 6.5 hours to 30 minutes B) 6.5 days to 2.2 seconds C) 3 days to 1 hour D) 2 weeks to 24 hours

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Answer: C: Contour’s technology worked (90% faster LCs) but the LC market itself was declining and non-bank participants never adopted.

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Q5. What is the recommended TCO multiplier to apply to initial development estimates for a realistic 5-year cost?

- A) 1.5× B) 2× C) 3× D) 5×

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Answer: C: SDX has a single operator (SIX Group), FINMA licence, and existing client base, avoiding all common consortium failure modes.