



Blockchain Use Case Best Practices

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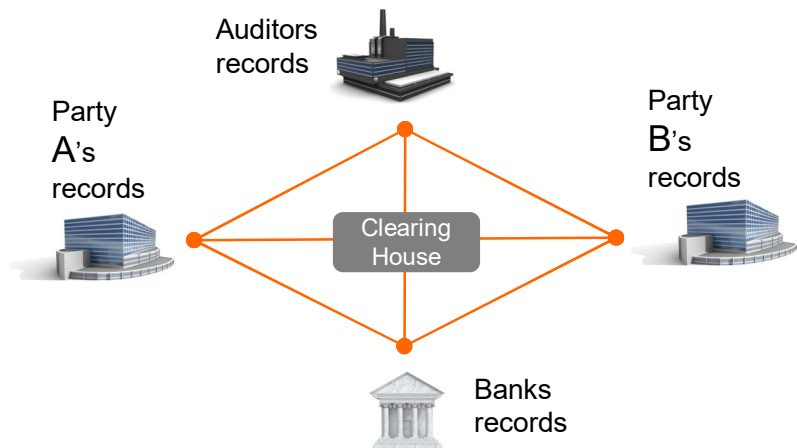


Session Objectives

- How do I determine if a workload is a good fit for Blockchain?
- How can Blockchain reduce time, cost, and risk for my organization?
- What are the performance implications?
- What are some of the best use cases for Blockchain?

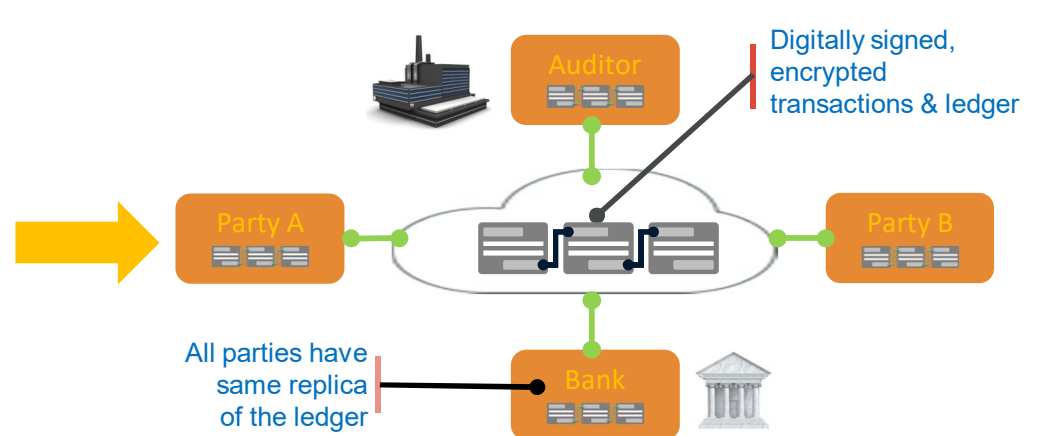
Blockchain will fundamentally change business processes

Traditional



...inefficient, expensive, vulnerable

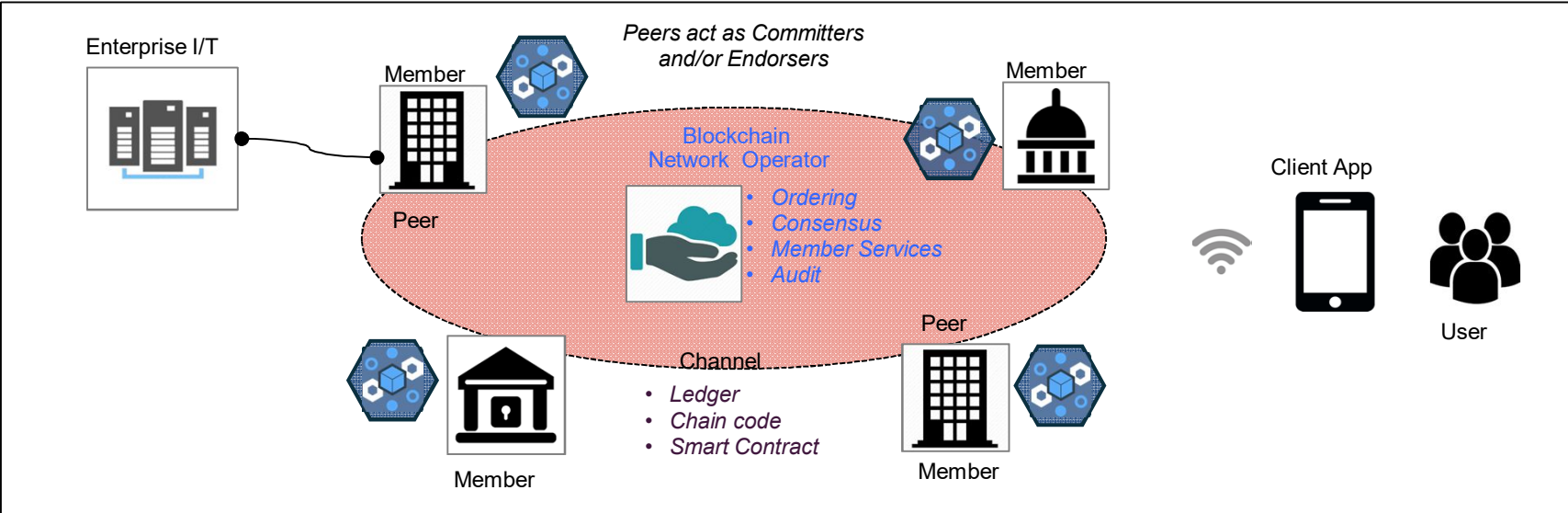
With Blockchain



...provenance, immutability, finality



What's in a Blockchain Business Network



Blockchain underpins Bitcoin...



 **bitcoin** is:

An unregulated shadow-currency - permissionless

The first blockchain application

Resource intensive

Blockchain for business differs in key areas:

Identity over anonymity - permissioned

Selective endorsement over proof of work

Assets over cryptocurrency



Blockchain Benefits



Saves time

Transaction time from days to near instantaneous



Removes cost

Overheads, paper-intensive processes and cost intermediaries



Reduces risk

Tampering, fraud & cyber crime caused by single-party system control



Increases trust

Through shared processes and recordkeeping via new digital economy built on blockchain applications



Hyperledger, a Linux Foundation project

- Announced by The Linux Foundation on December 17, 2015 with 17 founders, 130+ members
- Hyperledger is an open source and openly governed collaborative effort to advance cross-industry blockchain technologies for business, hosted by The Linux Foundation.
- Hyperledger Fabric is a blockchain framework implementation and one of the Hyperledger projects, intended as a foundation for developing applications/solutions with a modular architecture

Enable adoption of shared ledger technology at a pace and depth not achievable by any one company or industry

Premier



General










Associate



7 design principles of sustainable blockchain business networks



-  1 Providing network participants control of their business
-  2 Provision for an extensible business network – Flexibility in membership
-  3 Permissioned but protected network – Protecting competitive data
-  4 Open access and collaborative global network – Collective innovation
-  5 Scalability – Transaction processing and data encryption processing
-  6 Security – New security challenges of shared business network
-  7 Coexisting with existing systems of record and transaction systems



Blockchain Workload Indicators

Positive Indicators

- ✓ Managing contractual relationships
- ✓ Complex business logic
- ✓ Identity is important
- ✓ Transactions need to be private
- ✓ Market approach needed
- ✓ More than two parties
- ✓ Looking to reduce costs
- ✓ Want to improve discoverability

Negative Indicators

- ✗ Need high performance (millisecond tx)
- ✗ Small organization (no business network)
- ✗ Looking for a database replacement
- ✗ Looking for a messaging solution
- ✗ Looking for transaction processing replacement
- ✗ Very high assets volumes (millions)



The Top 10 Blockchain Roadblocks

1. Compelling use case costs/benefits
2. Cost of overhaul of legacy systems
3. Misaligned incentives
4. Standards
5. Scalability/Performance
6. Governance
7. Regulatory issues
8. Legal risks
9. Cryptology/Security
10. Simplicity/Interoperability



What's in the Block ?

- **type** - Transaction type that is taking place.
- **chaincodeID** - the ID of the chaincode that was called on
- payload** - Contains all the processes being made in the transaction such as functions, assets names and arguments
- uuid** - The unique identifier of this transaction
- timestamp** - The time at which the block or transaction order was proposed
- cert** - Certificate of the participant submitting the transaction
- signature** - Signature of the participant submitting the transaction
- stateHash** - The hash of all the transactions in the block
- previousBlockHash** - The hash of the previous block in the chain
- consensusMetadata** - Consensus modules may optionally store any additional metadata in this field
- nonHashData** - Data stored with the block, but not included in the blocks hash. This allows this data to be different per peer or discarded without impacting the blockchain
- localLedgerCommitTimestamp** - The time at which the block was added to the ledger on the local peer

0	Undefined
1	Deployment
2	Update
3	Invoke
4	Query
5	Terminate

Blockchain Performance

- GO Lang
- + RocksDB
- + Security
- + Consensus

- Multithreading, Scaling, Capacity, . . .



Blockchain technology across industries



Cross Industry	Financial	Government	Healthcare	Insurance	Manufacturing
Shared reference data	Letter-of-Credit	Land Registry	Medical records	Claims processing	Supply chain
Internal financial ledger	Cross currency payments	Vehicle Registry	Medicine supply chain	IoT integration for policy monitoring	Product parts
Audit and compliance enablement	Mortgages	Citizen ID			Maintenance tracking
Regulatory view					
Improved efficiencies					
Innovation					
Digital property management					

New Opportunities for Innovation by (Selected) Industry



Financial

Trade Finance
Cross currency payments
Mortgages

Public Sector

Asset Registration
Citizen Identity
Medical records
Medicine supply chain

Retail

Supply chain
Loyalty programs
Information sharing (supplier – retailer)

Insurance

Claims processing
Risk provenance
Asset usage history
Claims file

Manufacturing

Supply chain
Product parts
Maintenance tracking

Selected References

FX Netting



Settlements through digital currency



Identity management



Food Safety



Private Equity



Channel Financing



Low liquidity securities trading and settlement



Cross Border Supply Chain



Contract Management



Blockchain Solution for IBM Global Financing (IGF)



Our Commercial Financing business provides working capital to IT suppliers, distributors and partners through financing of inventory and accounts receivables

What?

Improve the efficiency of our commercial financing business by sharing data in a secure and transparent manner on Blockchain

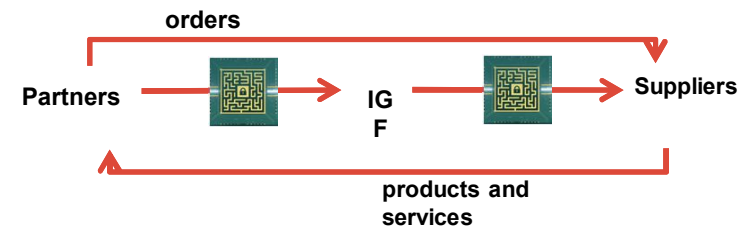
How?

Blockchain enables Comprehensive View of key operational data:

Purchase Order > Transaction Approval > Shipments > Invoices > Remittances

Benefits

- Fewer disputes & faster settlement
- **Reduction in dispute resolution time: 44 days to under 10 days**
- Improved capital efficiency; freer flow of capital



IGF world-wide statistics			
4000+ Partners and Suppliers	2.9M Invoices / year	\$44B Financed / Year	
\$100M Capital tied up any time!	25,000 Disputes / year	\$31K Avg. disputed invoice value	44 days Avg. time to resolve a dispute



Major US Healthcare Provider

- Healthcare Use Case Examples
 - Medical records
 - Images
 - Financials
 - Provenance of pharmaceuticals or products from birth to death
- A Pricing Alignment Blockchain First Project PoC with the following nodes and approvers:



- Business Case: \$3M in annual savings could be achieved through reduced write-offs and reduced labor

Private Equities



- Equity securities and debt in operating companies that are not publicly traded on a stock exchange - Private equity has lower volume of transaction and is more manual when compared to other asset classes
- 1 client and 1 fund in the IBM High Security Business Network (HSBN)
- Business Network: Investment managers, general partners, limited partners, fund administrators, tax advisers, legal, auditors and regulators
- Benefits
 - Greater transparency, efficiency and security to an asset class that has remained largely paper-based and manual
 - Benefit to investor and private equity management firm: Improved time to market to launch new funds -> \$\$ invested quicker
 - Benefit to regulator: real-time access to data



Blockchain Best Practices: Large Bank in Middle East

- Blockchain started as "a casual chat", an experiment
- First test - a digital thank you for employees
- Success led to 3 Use Cases:
 1. Fraud for Checks
 2. Trade Finance
 3. Payments
- PoCs and Use Cases were key. For the Trade Finance and Payments Use Cases partnered with another bank
- The best use cases are ones that are not too easy but not too hard. A purely internal use case is almost useless. A use case is best when it contains only a few nodes where members will agree to be part of the blockchain (such as the bank partner) but that will create a large enough ROI to demonstrate a successful business case.



Blockchain Challenges: Large Bank in Middle East

- 80-20 rule: 80% shift of business processes and 20% technologies
- Technology is the easier part; Governance is harder.
- Created an internal blockchain Center of Excellence:
 1. To get hands dirty
 2. To explore Use Cases
 3. To create a dedicated team and management
- Platform selection and lack of enterprise standards
- Lack of licensing models standards
- Management of organizations
- Quantitative validations of business cases
- Lack of skills



Large Bank in Middle East – Future of Blockchain

- Need portable standards to make sure can migrate to standard platforms of the future
- Security and flexibility key - a decoupling architecture; platform agnostic.
- Impressed with the open source aspects of Hyperledger Fabric and IBM Blockchain implementation.
- Would like to see a significant Know Your Customer (KYC) model for blockchain where a consumer can open an account at one bank and then easily open one at another bank.
- Starting with transfer of information assets; value transfer will come later.
- Consortium created to share experiences
- The ultimate measurement in the future of the true global benefit of blockchain will come with massive adoption

Where to start?



Choose a Blockchain Fabric that offers an open architecture and tooling



HYPERLEDGER
BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

Hyperledger Fabric

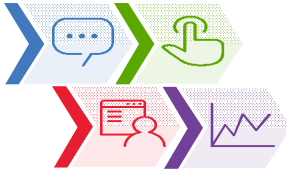
Hyperledger Composer



Make Blockchain Real



Garages



Engagement



Choose a Hosting Platform



IBM High Security Business Network



IBM Bluemix



docker

How Do I Get Started ?

Let's Talk

1. Discuss Blockchain technology
2. Explore customer business model
3. Show Blockchain Application demo

Remote or face to face

Free of charge

Blockchain Hands-on

1. Understand Blockchain concepts & elements
2. Hands on with Blockchain on Bluemix
3. Standard demo customization

Remote or face to face

Free of charge

First Project

1. Design Thinking workshop to define business challenge
2. Agile iterations incrementally build project functionality
3. Enterprise integration

Face to face

For fee

Scale

1. Scale up pilot or Scale out to new projects
2. Business Process Re-engineering
3. Systems Integration

Face to face

For fee