Making Blockchain Real for Business

Revisiting Design principles of Blockchain network: addressing security, scalability and sustainability by design

Inspirations from Real World Use Cases & Deployments

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Blockchain and Digital Money

Time & Trust
Blockchain

A Platform for:

- Trusted Digital Transaction System
- Disintermediation
- Co-creation models
- Digital Marketplace
- Multiparty trust network
- And more ...
Blockchain and Healthcare Ecosystem

- Patient
- Lab
- Radiology
- Specialist
- PCP
- Hospital
- Payer(s)
- Research
- Regulator/Auditor/Govt.
Blockchain-based solutions can streamline and transform processes in the healthcare industry.
Bundled Payments: fastest growing Alternative Payment Model

“All-in” reimbursement price for an episode of care
- Goal is to reduce cost of care while improving patient outcomes
- Payers shift risk toward providers

Common Bundled Episodes of Care
- orthopedic surgery, hip/knee joint replacement, cardiac procedures

Program Structure
- Two levels of contracts among stakeholders – bundle program & risk-share agreements
- Coordination of care across multiple healthcare providers
- Information exchange – claim, quality and other data shared across stakeholders
- Two primary models – Retrospective, Prospective

Source: Forbes (fastest growing APM)
What makes this problem difficult to solve?

Systemic challenges cause pain points contributing to limited adoption of bundled payment programs

**Risk Management**
Bundled Payment programs result in a major shift of risk to providers

**Multiple Stakeholders**
Cross-Organization coordination required for success

**Low Trust**
Payers and Providers do not share a single source of truth.

**Lack of Standardization**
Multiple program constructs and variation in episode of care definitions

**Operational Challenges**
System limitations at both Payer and Provider inhibit processing at scale

**Limited Visibility**
Lack of real-time visibility into bundle status across stakeholders limits proactive risk management

**Manual Processes**
Manual, inefficient and redundant processes across multiple stakeholders.

**Delayed Reconciliation**
Protracted time frames for reconciliation of actual vs target costs.

**Lack of Provenance**
Unclear history of data associated with each transaction.
Bundled Payment Solution

1. Claims from providers
2. Bundle identification and performance calculations by Smart Contracts
3. Bundled claims
4. Payment or Penalty
5. Bundled Payment Allocation
6. Gainsharing payment

Out of network providers
- Hospital
- Post Acute Care
- Physician

Patient information from provider

Payer
Convener/Episode Initiator

Bank
Bundled Payments on Blockchain

**Today**
- Manual reconciliation of claims under a bundle
- Months for payment reconciliation and no view into bundle performance until reconciliation
- Fragmented data regarding claim activity
- Lack of provenance for payment decisions

**With Blockchain/DLT**
- Smart contracts perform automated reconciliation of claims across contract participants
- Real-time reconciliation and view into bundle performance
- Shared and trusted information about claims stored on chain
- Immutable record for provenance and auditing
4 Steps

1. Identify the Use Case
2. Create the Business Blueprint
3. Map Business Blueprint to Technology Blueprint
4. Enterprise Integration

Blockchain Network
Step 1

Use Case Should Have:

Enterprise Impact

Industry Impact

Why:

Network Effect is essential

Must justify costs of investments
Step 2

Understand the Business Process:

- distill existing process into blockchain model
- redefine as necessary
- narrow the focus

Why:

- discover inefficiencies
- uncover interaction points
- Find dependencies

Create the Business Blueprint.
Step 3

Business components feed into technical requirements:

- define the smart contract logic
- choose a consensus protocol
- format the block data
- data visibility rules
- existing system integrations

Why:

- uncover risk and total costs
- understand total impacts

Map Business Blueprint to Technology Blueprint
Step 4

Consider operational integration points:
- ensure the trust model tenant is met
- eliminate redundancies of existing systems
- maximize savings and new efficiencies

Why:
- work with internal business processes
- proprietary value additions
- eliminate roadblocks to adoption
Path to enterprise adoption

Use Case Identification

Enterprise Impact and Industry Impact

Meaningful issues should revolve around significant costs to enterprise and industry

Business Blueprint

Existing business process is distilled down to blockchain-based model

Reinventing the business based on a trust system

Technology Blueprint

Technology to align with the business imperatives

Technology design decisions and deployment options

Enterprise Integration

Integration with down stream transaction systems reflecting on critical business systems

Blockchain network

IBM Blockchain
Lessons learnt:
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
7. Coexisting with existing systems of record and transaction systems
Recent Publication: Blockchain for Business
Making Blockchain Real for Business

THANK YOU!

Nitin Gaur – ngaur@us.ibm.com
Making blockchain real for business with over 600 engagements and multiple active networks

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Network of networks: Driving NextGen economies

GLOBAL TRADE
- Customs / Govt. Agencies
- Freight Forwarders
- Airlines
- Ocean Carriers
- Port Authorities
- Provenance Digitization
- Shared Economy

CONSUMER INDUSTRY
- Agriculture
- Flowers & Perishables
- Cattle Farms
- Warehouses
- Supplier
- Wholesale
- Retail
- Consumers

FINANCIAL SERVICES
- Trade Finance
- Insurance
- Payments
- Supply Chain Finance
- Payments

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Going back to basics

**Fundamental Tenets** – Trade, Trust and Ownership

**Duality of Transactions** – Issues of Clearing and Settlement

Focus just cannot be on **digital assets** (Tokenization of assets)

Is **Digital Identity** Essential?
- Non repudiation
- Establish ownership
- Claim on instance of an digital/crypto asset

What are we solving if we are ONLY solving for **reconciliation of ledger entries**?

**Digital Fiat** or a similar instrument is essential to solve the last mile – settlement issue

**Digital Identity** is diagonally essential to Digital fiat/crypto asset/ Digital asset
My focus for 2019 wrt to Blockchain

- **Digital identity**: foundation technology to ensure the trade and ownership.
- **Digital fiat**: address the last-mile issue of settlement for every financial transaction.
- **Asset tokenization**: ensure that digital manifestations reflect real-world assets.
- **Security design of the blockchain system**: address non-repudiation, privacy, confidentiality; and verifiability of claims with consent-driven models.
- **Business of blockchain business models**: a befitting business model to progress blockchain agenda.
- **Governance model**: self-governance networks to consortium-defined; and semi-autonomous governance structures.
What would enterprise chain infrastructure look like?

Integrated enterprise will need more than one specialized use case

- Driving synergies between blockchains
- Invisible blockchain infrastructure
- Inter- and Intra-enterprise connections
- Concept introduction
  - Interledger
  - Intraledger
- Cross the trust systems for transactions
- Fractal visibility of ledger data
- Enterprise visibility – control
Vision – ‘Enterprise Synergy’
Enterprise chain infrastructure

Design that enables new business models

- Invisible enterprise chain infrastructure will provide foundation
- Use of connectors, APIs to enable incumbent systems chain aware
- Conditional contracts between chains – ‘Enterprise Synergy’
- New business (e.g., P2P lending, crowdfunding) solely on blockchain
Separating blockchain from cryptocurrencies

- Cryptocurrencies are one specific usage of Blockchain technology
- Blockchain can be used to solve many more real-life business challenges without the fallacies of cryptocurrency

**Key Attributes**

- Exchange of digital currencies using cryptography
- First cryptocurrency = Bitcoin
- Fully decentralized
- Anonymous participation, Transparent activity

**IBM Blockchain**

However, we need few key attributes for Blockchain to be business ready