Enterprise Blockchain Applications

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Agenda

- The big picture
- Blockchain in the enterprise
- Case studies
- Thoughts
- Q&A
The big picture
Technology leaps rewrite transactional costs

When the **cost of transaction** changes, the underlying **economic order** of the transaction changes as well

*Oliver Williamson, economist and 2009 Nobel Prize winner*

"**IoT** lowers the cost of *monitoring*

**AI** lowers the cost of *prediction*

**AR** lowers the cost of *interaction*

**Blockchain** lowers the cost of *trust*

-@akadiyala
Scaling trust => larger TAM

Artisan age
Local knowhow
Local commerce
Local trust
Local scale

Trust is codified via local social signals

Industrial age
Regional knowledge & knowhow
Inter-regional commerce
Inter-regional trust Inter-regional scale
Hard to scale

Trust is codified via social & legal frameworks

Intelligence age
Global knowledge & knowhow
Global commerce
Global/regional trust
Global scale & very rapid scaling

Trust via laws, contracts, social & cryptography
Scaling trust => larger TAM

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<td>cryptography, Trust via laws, contracts, social</td>
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Trust automation slashes transaction cost (and business risk) by orders of magnitude.
Blockchain in the enterprise
Conversations are shifting

What is it? Do we need it? Let's try it.. Let's leverage it!
Blockchain
Not just about the ledger

What we hear today

- Distributed
- P2P
- Immutable
- Cryptography
- Smart contracts / chaincode
- Consensus
- Side chains
- Forking (soft & hard)

Emerging concepts

- Zero Knowledge proofs
- Zk-SNARKs
- Homomorphic encryption
- Elliptic curve cryptography
- Quadratic voting
- Prediction markets
- Schnorr signatures
- Self-sovereign identity
What are enterprises using blockchain for?

- Single source of truth
- Trusted transactions
- Near-real time data sharing
- Immutable ledger store

- Track the provenance of products and materials
- Reduce friction in business transactions and reconciliations
- Securely maintain and share decentralized private records
- Enable distributed, autonomous marketplaces
### Financial Services
- Intra-Bank Cross Border Payments/Remittances
- Inter-Bank National Payments
- Brokerage funds transfer
- Corporate B2B Payments
- Bank Guarantee
- Supplier / Vendor Finance
- Invoice Factoring
- Full Trade Lifecycle Mgmt
- Securitization
- Customer onboarding/KYC
- Lending/Credit Advance
- Loyalty points networks

### Supply Chain
- Genealogy and traceability of parts, components, ingredients
- Maintenance parts tracking in multi-layered distribution
- Parts & maintenance tracking for aircraft & other regulated assets
- Farm-to-table food provenance
- Country of origin traceability
- Electronic compliance records
- Quality control records
- Tamper-proof IoT sensor data, non-repudiation of monitored activities

### Public Sector
- Government records (titles, birth certificates, licenses, etc.) sharing
- Customs (import/export licensing, excise taxes)
- Regulatory certifications (food, pharma, etc.)
- Procurement/Acquisition
- Citizen services, e.g., benefits, multi-agency programs
- Digital Employee Records
- Digital Identity and Identity Proofing

### Healthcare
- Electronic Health Records
- Service provider credential management
- Revenue cycle – claims adjudication, disputes
- Clinical Tamper-proof IoT sensor data, non-repudiation of monitored activities, trials
- Anti-counterfeit track & trace for drugs
- Cold chain track & trace
- Integration with IoT devices monitoring health or equipment
IoT + blockchain in Supply Chain

• Product journey and lifecycle
• Point-of-origin
• Change of custody and ownership
• Tampering and counterfeiting attempts
• Global Trade Compliance
• Automated Bill of Lading and Customs
• Supplier performance management
• Trade Finance
Blockchain in HR

- Skill Passport
- Talent markets
- Smart Contracting
- Employee workflows
- Background Checks
- Cross border payments
Case studies
Oracle blockchain Cloud (GA in July 2018)

**LOGISTICS**
- CargoSmart
  - Maritime shipping documentation

**PROJECT MANAGEMENT**
- Solar SiteDesign
  - Solar Energy Project Tracking & Rewards Solution

**E-COMMERCE**
- M2O
  - Multi-brand loyalty network

**CORP. FINANCE & FINANCIAL SERVICES**
- IndianOil
  - Bank Guarantee
- AJIB
  - Funds Transfer

**IMPORT/EXPORT**
- Nigeria Customs Service (NCS)
  - Excise Licensing and Taxes

**PHARMACEUTICALS**
- NITI Aayog
  - National Institution for Transforming India, Government of India
- Apollo Hospitals
  - Strides
  - Anti-counterfeit drugs tracking

**SUPPLY CHAIN**
- certifiedorigins
  - Food Provenance & Quality Tracking
Ag: Food Provenance & Quality Certification

1. Product Provenance Tracking
2. Production quality & ingredients testing visibility
3. Product journey tracking (temperature, etc.)
4. Change of ownership and custody verification
5. Paperless logistics
Anti-counterfeit Drugs Tracking in India

• Problem by the numbers:
  – India accounts for 10% of WW production
  – WHO estimates 20% of all drugs sold in India are fake
  – As the largest producer of generic drugs in the world, India is reported to be the source of 35% of all counterfeit drugs sold worldwide

• Solution
  – Track drugs from Mfg to Distribution & Retail using IOT and Blockchain
  – Pilot involves premier super specialty hospital, Apollo Hospitals and a global pharma company, Strides Pharma Sciences
Trade: Customs Service Excise Licensing and Taxes

Moving from a paper based excise duty collection and licensing process to utilizing a blockchain network built on Oracle Autonomous Blockchain Cloud Service as the single source of truth for license issuance and excise duty payments

**Before Blockchain**
- Paper based records
- Records often lost in transit
- Complicated and error-prone reconciliation processes
- Delayed settlement
- Manual on-boarding of excise traders
- Limited scale to collect duty
- Largely a manual process
- Low transparency for government and regulatory bodies

**Blockchain Benefits**
- Digital immutable records
- Digital delivery of records
- No reconciliation required
- Faster settlement
- Automated on-boarding
- Scalable solution to collect duty
- Automated processes
- Greater transparency to government and regulatory bodies
Banks: Global Loyalty Network (GLN)

Bank-anchored global integrated platform that offers **cross-border use of loyalty points and benefits around the world**

**BENEFITS**

**Enhance Customer Experience**
- Can use your country points in other countries.
- Typical use cases – payments, offline/online shopping, remittance
- No complex transfers that take weeks or months to complete

**Increase Operational Excellence**
- All participating companies simultaneously store identical transaction data -> enables accurate settlement without additional reconciliations

**Create Business Value**
- Good way to consume debt
- New business model based on exchange of digital currencies between global financial institutions
- Your customers → My customers → Our customers
Oil & Gas: Bank Guarantee

- Current process is paper based and manual
- Beneficiary is dependent on the Vendor for interactions with the Banks
  - Discrepancies after they receive the hard copy from the bank take time and effort to correct
  - Potential tampering with the content, requires extra verification steps
  - Lack of tracking makes proactive actions (invoke, amend or return) impossible
  - Lack of Transparency between all parties
  - Errors in manual interactions to correct or verify BG

Blockchain Benefits

- Establish trusted network to allow only authorized transactions
- Reduce the dependency, allowing direct interactions between parties
- Allow verification of the Digital BG before requesting a hard copy.
- Digital BG copy stored in the public ledger as a tamper proof immutable record
- Provide visibility into status and delays through a dashboard
Mfg: Invoice Factoring in a Multi-LOB Conglomerate

Before Blockchain
- Internal validations
- Costly and error prone reconciliations
- Manual submission to investors
- Delayed settlement

Blockchain Benefits
- Improved visibility & pool management
- No reconciliations
- Automated reports
- Faster settlement

- Manual on-boarding of investors
- Limited to bigger investors
- Largely a manual process
- Limited liquidity

- Automated on-boarding
- Easier to bring on smaller investors
- Better pricing using bids
- Faster settlement
Banks: Cross Border Funds Transfer for Subsidiaries

- A large bank with multiple regional subsidiaries
- Current cross-border transfers between the subsidiaries use SWIFT services, which
  - Are not real-time and require too many manual interventions
  - Charge fees and other expenses
- Blockchain benefits
  - Smart contracts enable automated transfers based on rules
  - Real-time handling of transfers
  - Integrated audit trail of transfer requests and confirmations, available to clients through mobile and Internet banking interfaces
Fighting Fraud in Insurance Claims

- Claim Details are owned by different insurance corporations
- Potential fraud cases due to duplicate claim against multiple insurance corporations
- Access to claim details is restricted and based on permission
- Automation & audit
Thoughts
Solutions needed to cross the chasm

TOOLS
- Better developer tools for faster, smoother dev cycles
- Operations: Member on-boarding, monitoring, supportability, lifecycle management, and Key management

GOVERNANCE
- On blockchain & for blockchain
- Configuration management, workflows, reporting, recovery

IDENTITY
- Retail, government, travel, conglomerates
- Cyberphysical world needs granular, user-managed identities for multitude of use cases

PAYMENTS & CRYPTOCURRENCY
- Unit of account/exchange
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Government: Identity Tracking and Asylum Case Status Sharing

• A major European country handling large influx of refugees
  – Identity proofing and tracking across multiple federal and state agencies
  – Case status and benefits coordination across multiple agencies
• Expected blockchain benefits
  – Single source of truth reconciled between multiple ministries at the federal and state level
  – Better integration of benefits eligibility and access to eliminate gaps and fraud in the system
  – Automatic notifications across agencies on status changes in near real-time