Risks with Blockchain

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Manu Mankad
Managing Director
Deloitte & Touche LLP

Dmitry Korneev
Senior Manager
Visa Inc.
Manu is a managing director in Deloitte’s Risk and Financial Advisory in San Francisco. He is a Certified Information Systems Auditor (CISA) and has been with Deloitte since 2003. He recently completed a two year Global Development Program (GDP) in United Arab Emirates.

Manu has extensive experience in managing internal audit cosourced engagements, contract risk compliance and consulting clients on enterprise risk management, internal controls design and implementation, and information technology governance. He specializes in IT internal audit, information security, third-party assessments, business continuity management, business process and operational control reviews. He has designed and evaluated application controls, general computer controls, and segregation of duties assessments for various technology applications. Operational and regulatory experience includes fraud risk assessments, Bank Secrecy Act/Anti-Money Laundering, FCRA/ FACT Act and GLBA/Privacy regulatory compliance projects.

He has also performed entity-level, business process, and general computer controls (GCC) assessments in support of year-end financial audits. Prior to joining Deloitte, Manu received his MBA in Finance and International Business and BA Communications from the University of Washington.
Dmitry Korneev is a Senior Manager, Visa Inc. in San Francisco. He is a Certified Fraud Examiner (CFE) and Encase Certified Examiner. He has over 12 years of experience in financial and consultative industry. He has experience of working with several internal audit clients in the Australia, UK and Russia.

Dmitry has extensive experience in leading internal audit function. In this current role, he is responsible for managing forensic and discovery projects on internal investigations financial fraud & conflict of interest. During his tenure with Visa Inc., Dmitry leveraged his experience in IT forensic and compliance to build expertise in the risks associated with the use of blockchain technology. He is a blockchain evangelist within the company and spearheads initiatives aimed at raising awareness of the impact the blockchain technology on business operations, audit and compliance.

Dmitry received his Masters in Computer Science from MSTU, Russia.
How blockchain works

1. Individual block

2. Distributed network

3. Chain of blocks
Blockchain Value

Blockchain is to VALUE what the Internet is to INFORMATION → Hence, the Internet of Value

A distributed ledger allows digital assets to be transacted in an immutable manner, in real time

- No single ownership, Multiple contributors, No third party
- Transparent, Secure, Irreversible
- Low Friction
  - Near real-time settlement of recorded transactions
- Verifiable record of every transaction

Something represented in a digital form that has an intrinsic or acquired value (e.g., land, house, currency, votes, goods, certificates, identity, rewards, etc.)
Blockchain characteristics

Blockchain technology have particular characteristics that set it apart from other technologies.

Shared with other technologies
- Value transfer
- Data storage

Unique to blockchain
- Finality
- Immutability & audit trail
- Smart contracts
- Non-repudiation
- Disintermediation
- Decentralized

Common theme: Trust!
Different types of blockchain

Blockchain can be public, permissioned, or private, referring primarily to the participation in and permissions to the network.

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
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<tbody>
<tr>
<td><strong>Public Blockchain</strong></td>
<td></td>
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<tr>
<td>- Fully decentralized and require very low trust</td>
<td>- No transaction reversal or modification possible</td>
</tr>
<tr>
<td>- Fully transparent. Anyone can read, send transactions and participate in the consensus process</td>
<td>- Possibility of collusive actors</td>
</tr>
<tr>
<td>- Blockchains are secured by economic incentives and cryptographic verification</td>
<td>- Slow confirmation of transactions</td>
</tr>
<tr>
<td>- Limited privacy protections</td>
<td>- High transaction costs</td>
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| **Permissioned Blockchain** | | |
| - Faster and more scalable since transaction validation is controlled by a preselected set of network participants | - Complex access right management procedures so only preselected entities can read the blockchain |
| - Better privacy since permissions are restricted to participants | - More centralized |
| - Lower transaction costs since transaction validation is less demanding | - Partial decentralization leads to reduced finality, non-repudiation and immutability |

| **Private Blockchain** | | |
| - No need for mining, no transaction costs | - Centralized authority has a capability to implement changes or reverse a transaction. A network consensus is not required |
| - Fast transaction throughput. Scalable | - Advantages over a traditional database are less conspicuous due to ultimate centralization |
| - Low risk of external attacks | |
# When is blockchain the right fit?

A handful of requirements that, when met in part or in full, can indicate if blockchain will sufficiently address business need:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Shared data</strong></td>
<td>Structured repository of information</td>
</tr>
<tr>
<td><strong>Multiple writers</strong></td>
<td>More than one entity generating the transactions that modify the database</td>
</tr>
<tr>
<td><strong>Absence of trust</strong></td>
<td>Level of mistrust between the entities writing to the database (e.g., one user will not accept the “truth” as reported by another user)</td>
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<tr>
<td><strong>Opportunity for disintermediation</strong></td>
<td>Lack of trusted intermediary or central gatekeeper to verify transactions</td>
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<tr>
<td><strong>Transaction interaction</strong></td>
<td>Interaction or dependency between the transactions created by different entities</td>
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Blockchain impacts to business will be widespread as processes transform from linear silos to integrated networks.

**Security token offerings**
- Cryptographic blockchain-based tokens that represent financial assets such as bonds, notes, debentures, shares (stock), options, and warrants

**Cross-border payments**
- Near-real time settlement
- Reduced transaction costs
- Data rich architecture enabling sharing of significant data within each transaction

**Decentralized identity**
- Consumers and businesses can store their own identity data on their own devices
- They provide it efficiently to those who need to validate it, without relying on a central repository of identity data.

**Decentralized exchanges**
- A decentralized exchange is an exchange market that does not rely on a third party service to hold the customer's funds.
- Trades occur directly between users (peer to peer) through an automated process.

**Smart insurance contracts**
- Parametric insurance kicks in when a specific event occurs or measurable condition is met
- Blockchain technology can simplify the flow of information and payments among insurers and reinsurers.

**Content management**
- Blockchain can help preserve the integrity of content, validate the reliability of information and/or its sources, enable transparency and traceability

**Prediction markets**
- Reputation-based system in which you can be rewarded with profits for accurately predicting events.

**AML and KYC**
- Blockchain can serve as a trusted shared repository of AML and KYC data
- Smart contracts can be used to automate and streamline KYC procedures
Common blockchain risks

Risk Categories
- Strategic
- Contractual
- Regulatory & Legal
- Information Security

Risk Areas
- Chain permission and network participant risk
- Consensus and governance risks
- Code and cryptography risk
- System integration and scalability risk
- In-country and cross-border regulatory risk
- Knowledge and talent shortage risk

Reputational Risk Categories
- Business Continuity
- Ops and IT
- Supplier

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Future with blockchain

Blockchain could potentially eliminate data reconciliation and verification activities like accounts receivables, accounts payables and intercompany reconciliations.

- Integrated network of participants spanning the end-to-end value chain
- Integrated network of processes linking transactions across the entire business

Network participants:
- Sellers
- Buyers
- Regulators/Auditors
- Financiers
- Logistics providers

Business processes:
- Single source of truth
- Digital tracking
- Autonomous financing
- Autonomous settlement
- Identity & Credentials
Common challenges and opportunities for Internal Audit

- Tamper-proof audit log and chain of custody
- Paradigm shift from the traditional sample-based retrospective audit to proactive event-triggered monitoring
- Complex data structure requiring new approach to data analytics
- Evolution of the role of Internal Audit due to decentralization of cross-company operations
- Autonomous audit and compliance bots
- Unique blockchain techniques: blockchain receipts and anchors
QUESTIONS?
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