



Blockchain for Government Finance and Audit Professionals

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Opening Remarks



Moderator
Kinney Poynter
Executive Director
NASACT



Presenter
Christina Dorfhuber
Principal
Deloitte Consulting LLP



Presenter
Prakash Santhana
Managing Director
Deloitte Financial
Advisory Services LLP



Presenter
Will Bible
Audit & Assurance Partner
Deloitte & Touche LLP

Agenda

Overview

What is Blockchain?






When and how should Blockchain be used?

Market and regulatory environment

Implications for accounting and audit

Agenda (cont.)

By the end of this webinar, you will be able to:

-  Explain some of the different use cases of Blockchain technology
-  Have a basic understanding of Blockchain technical architecture
-  Outline some important considerations of this innovation
-  Discuss recent developments and impacts of Blockchain adoption and progression
-  Understand some of the implications for accounting and audit

Imagine if...



...you could see a tamper-proof trail of how the **food** on your plate got there



...you could have full control of your **personal data**, deciding what can be collected, directing what to share with whom, and restricting how it may be used



...you could immutably register your new **property**, see a tamper-proof record of past buy-sell transactions from the property, and transfer its ownership when needed without going through intermediaries or complex paperwork






Blockchain overview

What is Blockchain?

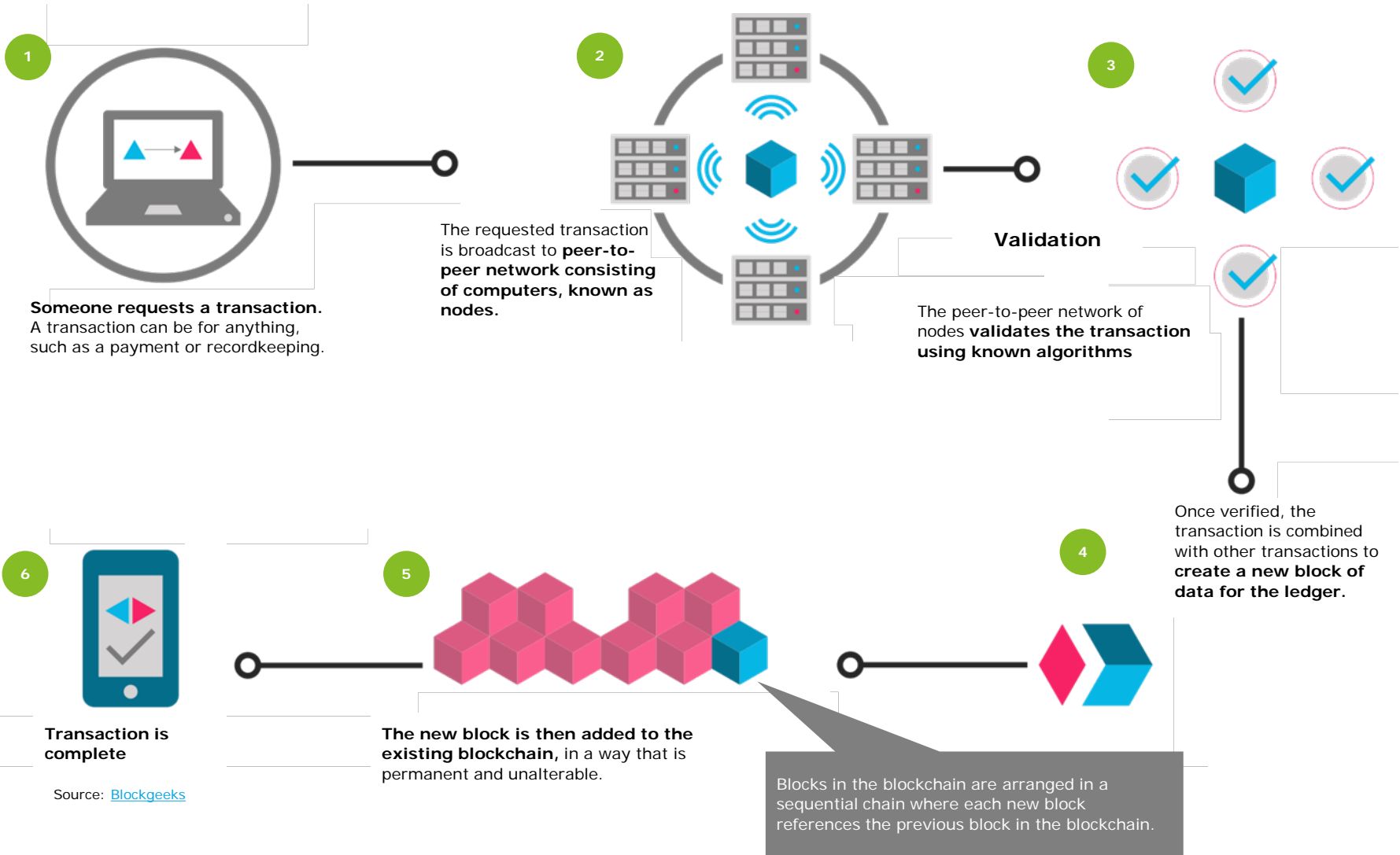
Blockchain is a distributed ledger that records digital interactions in a way that is designed to be secure, transparent, immutable, and auditable without having to rely on a trusted intermediary

Blockchain “the Internet of value”



Characteristics	Description
 Near real-time	Blockchain technology enables near real time settlement of recorded transactions, removing friction and reducing risk
 Trustless environment	Blockchain technology is based on cryptographic proof , allowing any two parties to transact directly with each other without the need for an intermediary
 Distributed ledger	The Blockchain architecture operates as a consensually shared and synchronized network of nodes spread across multiple geographies
 Irreversibility	Transactions verified and posted on a Blockchain cannot be reversed , mitigating the risk of double-spending, fraud, abuse, and manipulation of transactions
 Censorship resistant	Crypto-economics built into the Blockchain model provides incentives for the participants to continue validating blocks, reducing the threat of external influencers

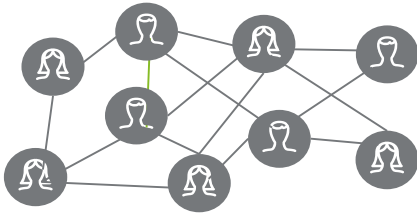
How does Blockchain work?



Three innovations laid the groundwork for Blockchain technology

1

Peer-to-peer network



In a peer-to-peer model, every peer in the network is a server and client, both supplying and consuming resources

2

Public key cryptography



Public key cryptography is a method for verifying digital identity with a high degree of confidence, enabled by the use of private and public keys

3





Proof-of-work



Proof-of-work is a piece of code appended to data that validates that data's authenticity and controls when it can be written into the system

The first Blockchain was created through the formation of Bitcoin

Blockchain deployment models

		Definition	Use case
1 Who can <i>view</i> the blockchain?	 Public	Anyone on the internet has full read access	<ul style="list-style-type: none"> • B2C relationship • Low trust • Transparency is beneficial • Network control not needed
	 Private	Inaccessible to public internet, with ability to limit access at node level	<ul style="list-style-type: none"> • B2B relationship • Data sensitivity • Autonomy in solution development beneficial • Complex IT maintenance acceptable
2 Who can <i>publish</i> to the blockchain?	 Non-Permissioned	Anyone with node software can read and publish any data	<ul style="list-style-type: none"> • System users are equal participants • Generally moderate trust in system
	 Permissioned	Maintainer decides who can publish, with ability to limit publishing rights	<ul style="list-style-type: none"> • Many users with distinct needs • Trust in system operators is inherently higher

What is cryptocurrency?

Cryptocurrency is a medium of exchange created and stored electronically on a Blockchain, using advanced cryptography to control the supply of monetary units and verify the transfer of funds between network participants

Method of payment / currency coins

Participants in the network use these coins to transact with one another for goods and services

Utility tokens

Participants in the network use these tokens to gain access to a specific product or service

Coin-as-a-service

Cryptocurrencies that allow more people to create their own tokens by providing a simplified language to deploy new currencies more easily

When is Blockchain the right fit?



If Blockchain is the right solution, what are some potential applications?

Transfer of value

Blockchain can efficiently facilitate transfers on peer-to-peer, business-to-business, and computer-to-computer transactions for minimal cost



Cross border payments

Blockchain can transfer payment across currencies almost instantly for a fraction of today's cost and provide access to the unbanked in remote areas



Digital identity

Blockchain can create an auditable source of information shared and verified across a network of organizations (e.g., KYC compliance)



Clearing and settlement

Blockchain shows promise to drive efficiency in the clearing and settlement process of digital assets through the use of colored coins



Provenance

Blockchain offers an immutable and irreversible source of information that can track the true ownership of a product across the supply chain



Multi-party aggregation

Blockchain can be used as a shared master data repository for common industry information allowing members to query the data



Record keeping

Blockchain provide a method for collectively recording and notarizing any type of data, whose meaning can be financial or otherwise



Smart contracts

Contractual terms and obligations can be programmed directly into the blockchain, maximizing adherence (e.g., syndicated loans, derivatives)



Authenticity

Blockchain immutable characteristic maintains the integrity of transactions, removing a central point of trust to validate transactions (e.g., real property management, land registry)

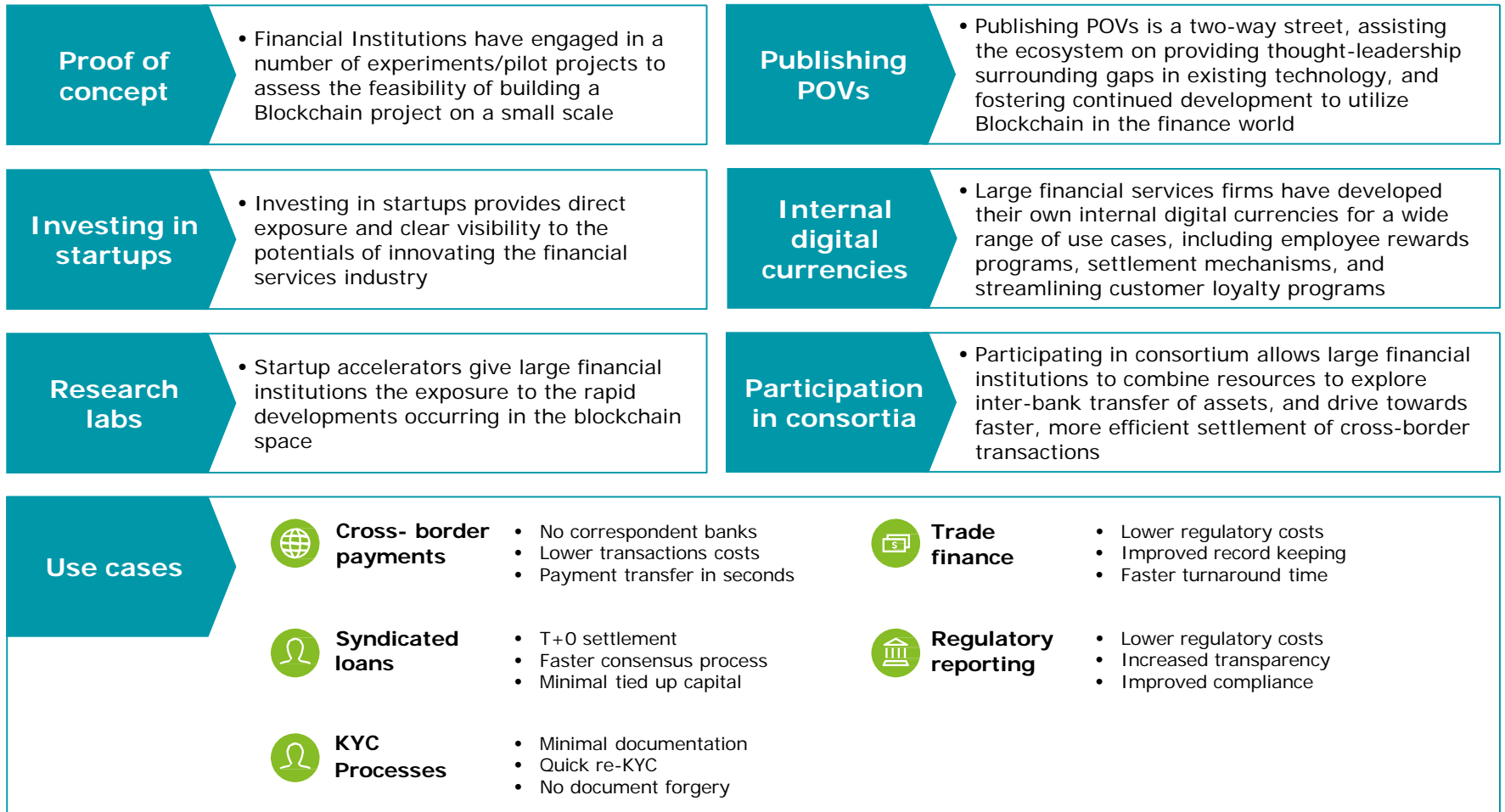


Audit trail

Transparency and total ordering of operations allows for a method to view transaction history, mitigating fraud and misappropriation of funds (e.g. funds control management for grants)



Financial services continue to be an industry that is heavily focused on Blockchain technology



Use-case overview: Know Your Customer (KYC)

Existing challenges



LACK OF AUTOMATION

Many banks are still using manual processes for reporting. This is time consuming and increases risk of error or manipulation.



TIME CONSUMING

Customer is often required to provide the same information during different occasions.



HEIGHTENED CHECKS

Number of checks is very high with repeated checks.

How Blockchain can help

Digital proofs guarantee the order and the content of transactions and data, enabling secure data transfers. Public distributed ledger allows for transparency.

Cryptographic proof does not require trust between parties. No centralized supervision. One distributed ledger allows for safe sharing of information.

Digital onboarding process allows for information to be updated within different financial institution with ease, while maintaining confidentiality.

Use-case overview: Regulatory reporting

Existing challenges



OPERATIONAL INEFFICIENCY

Manual processes for core systems are high cost and low value.



DATA MANAGEMENT

Data quality is low due to easy errors from manual keying and potential for manipulation.



COMPLEXITY AND CHANGE

Increasing requirements for granularity. Constantly changing regulations are costly when updating legacy applications.



COST CHALLENGES

Requires large investments to change legacy systems. Increasing FTE cost burden on fund administrators.

How Blockchain can help

By providing a single source of accurate and immutable data the Blockchain, a repository of transactional and fund data, can be used to develop greater analytics. A singular view of each participants positions across asset classes can be made available assisting in overall management.

Data is extremely difficult to alter. Blockchain does not have a central point of failure and is better able to withstand malicious attacks. Disaster recovery is inherently built into a blockchain as standard due to all parties having a copy of the ledger.

RegChain streamlines the traditional regulatory reporting processes by acting as a central repository for the safe storage and review of large volumes of regulatory data.

Smart contracts enable automatic execution of reporting requirements and auditing any changes made to the data by authorized parties.

Use-case overview: Insurance

Existing challenges



HIGH COMPETITION

Intense competition between carriers that have low-cost operations. Fragmented and complex legacy IT systems increase cost of operation.



REGULATION

Fiduciary rule issued by Department of Labor prioritizing client interests will disrupt the distributor incentive model.



SALES

Need for holistic financial planning solutions with more information and consultative distributors. Youth showing lower interest in traditional insurance products.



CYBER-RISK

Insurers possess large volumes of Personally Identifiable Information and are cyber crime targets. Risk of fraudulent claims.

How Blockchain can help

Process customer transactions more quickly; reduce overhead costs and paperwork; bolster security for personal health information. Transactions between insurance companies and their intermediaries can be settled near real-time.

Distributed ledgers create an auditable and immutable trail. Smart reporters may enable automatic regulatory reporting.

Enable setting up of insurance exchanges electronically linking consumers to carriers. Transparent calculation of premiums and frictionless evaluation of claims. Decentralized ledger to create marketplace and smart contracts guaranteeing payment.

Private, permissioned ledgers may help insurers guard against cyber attacks on Personally Identifiable Information.

Audit trail examples



Enforce regulations effectively

Current state

Slow enforcement process as new regulations cross multiple departments and national borders

Future state

Disputes resolved faster with fully transparent audit trail as regulations will be approved through consensus

Example: Legislative branch



Promote data integrity and record keeping

Current state

Data tampering prevalent due to data control and authority issues

Future state

Append-only characteristic reduces the threat of transactions or document tampering along the audit trail

Example: Record keeping



Improve supply chain management

Current state

Difficulty in effectively distributing product information on a near real time basis

Future state

End-to-end traceability, shared distribution, and consensus allows related parties access to necessary information during sensitive manufacturing and delivery

Example: Diamond provenance



Advance Know Your Client (KYC) procedures

Current state

KYC procedures are repetitive in nature as multiple agencies carry out identical KYC checks

Future state

A Blockchain based registry shared across government agencies creates a citizen's digital identity ending the duplication of KYC checks.

Example: Joint KYC utility development



Benefit welfare distribution system

Current state

Unbanked welfare claimants face barriers to enter the benefit system such as credit checks

Future state

Establishment of citizen digital identity through a securely encoded device allows welfare claimants to receive benefits at reduced transaction costs to authorities

Example: Welfare benefits



Improve land registry process

Current state

Vulnerable to human error and forgery as current land registry processes are highly manual and susceptible to manipulation

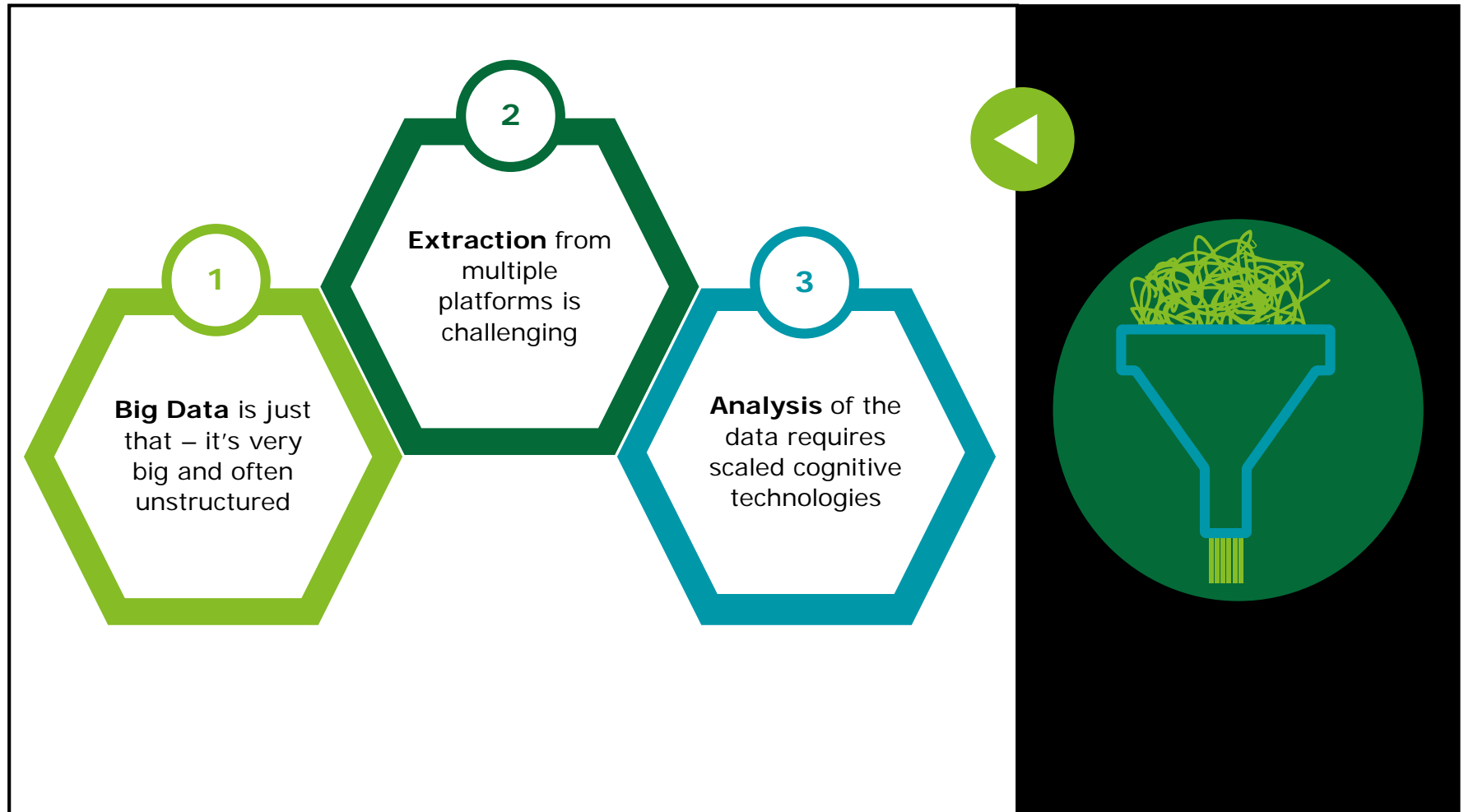
Future state

Higher confidence in land title ownership as properties can be uniquely coded and linked to individual smart keys only held by the owner

Example: Land registry

Implications for Accounting and Audit

Today, extracting and making sense of “big data” can be difficult



Data standardization



A common data platform = common data pool to build applications, including analytics and artificial intelligence.

Potential benefits to accounting and auditing

Data standardization and transparency

Financial statement preparation

- Continuous feed of structured data
- Automate financial statement preparation and reporting
- “Automate” counterparty reconciliation
- Continuous monitoring
- Advanced analytics and artificial intelligence



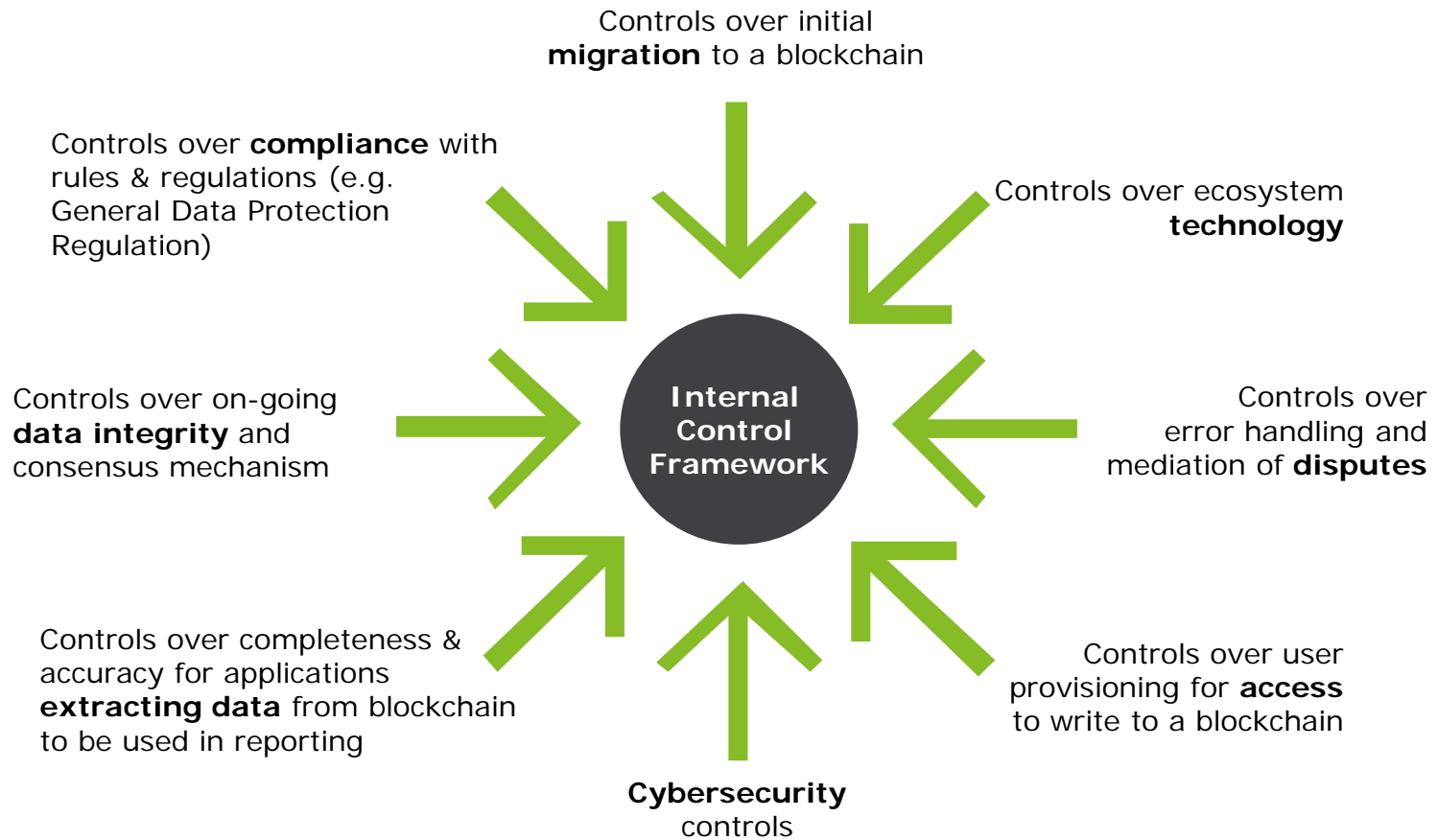
Auditing techniques

- Independent data extraction
- Real-time monitoring and exception reporting
- Memorialize evidence through time-stamping on the blockchain
- Advanced audit analytics scalable to multiple engagements
- Large training data for artificial intelligence



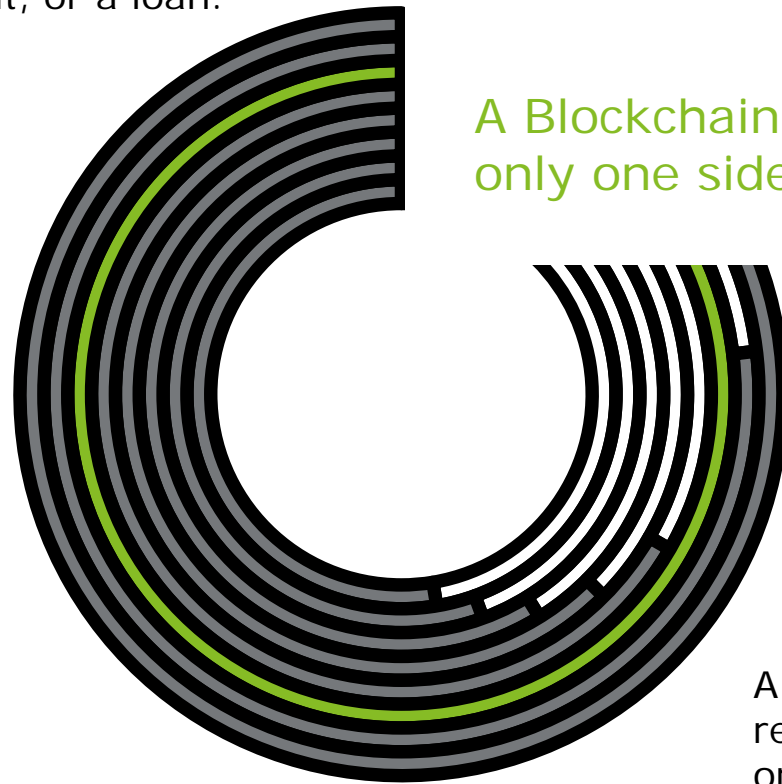
Risks to consider

Blockchains could augment critical databases



Where to record the credit?

For example, a record on a Blockchain to transfer a token could represent a payment, a prepayment, or a loan.



A Blockchain ledger may represent only one side of the accounting

A transfer could also involve related parties, a right of return, or other side agreements.

Unique digital risks

Financial risk

Loss of digital assets due to cyber attacks on system protocol, networks, wallets, end points and exchanges.

Digital theft can be instantaneous and may be impossible to reverse or recapture.

Technological risk

Unencrypted customer data can be exposed resulting in public disclosure of proprietary information / transaction history.

Confirmation of transactions may be delayed by blockchain protocol.

Operational risk

Blockchains may have complex identity verification systems, including cryptographic keys.

Losing the keys can mean permanently losing access to assets.

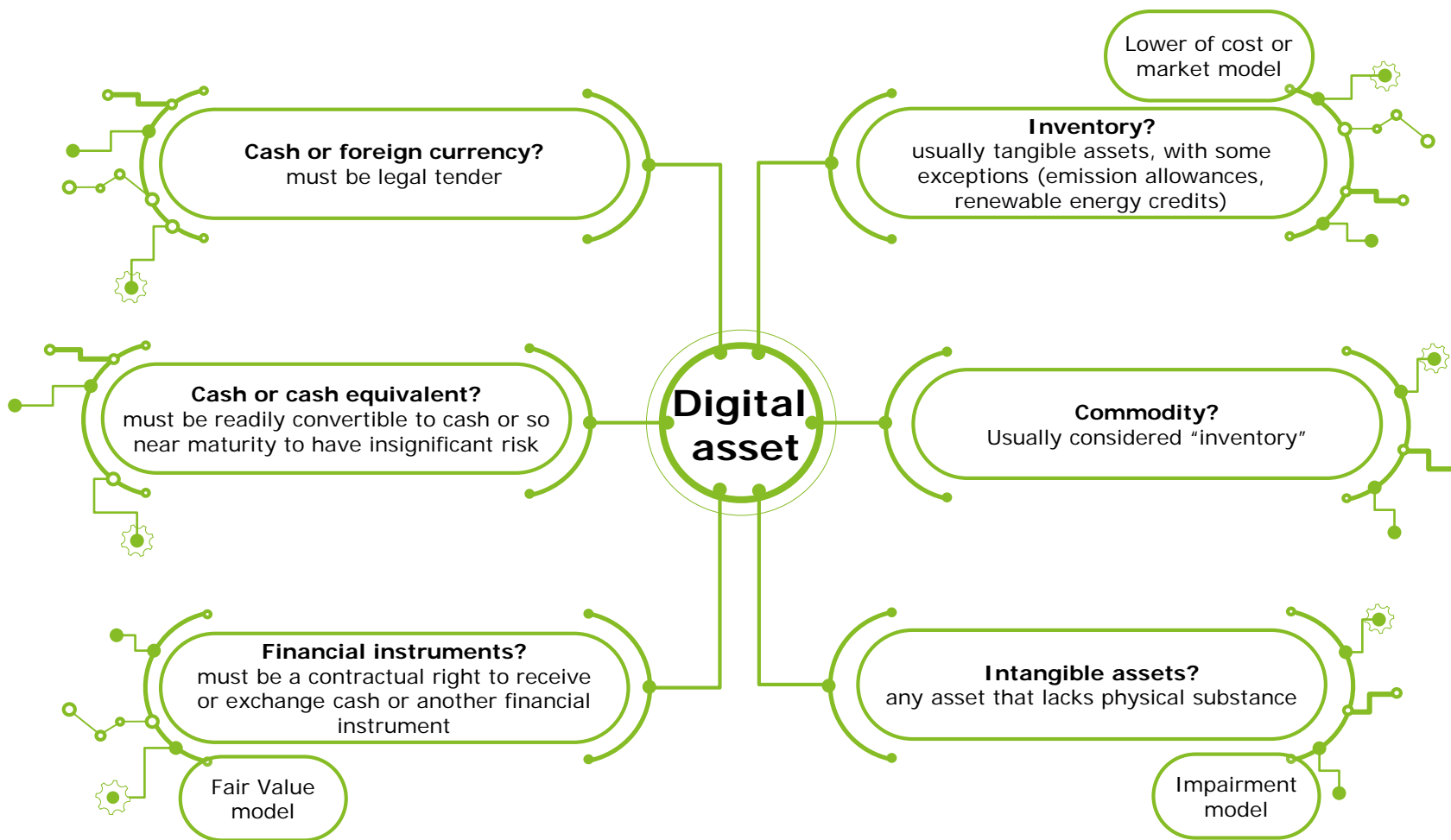
Regulatory and legal risk

There are unclear, evolving and varying regulations across jurisdictions.

What is the contract of record that will be used in court to settle disputes?

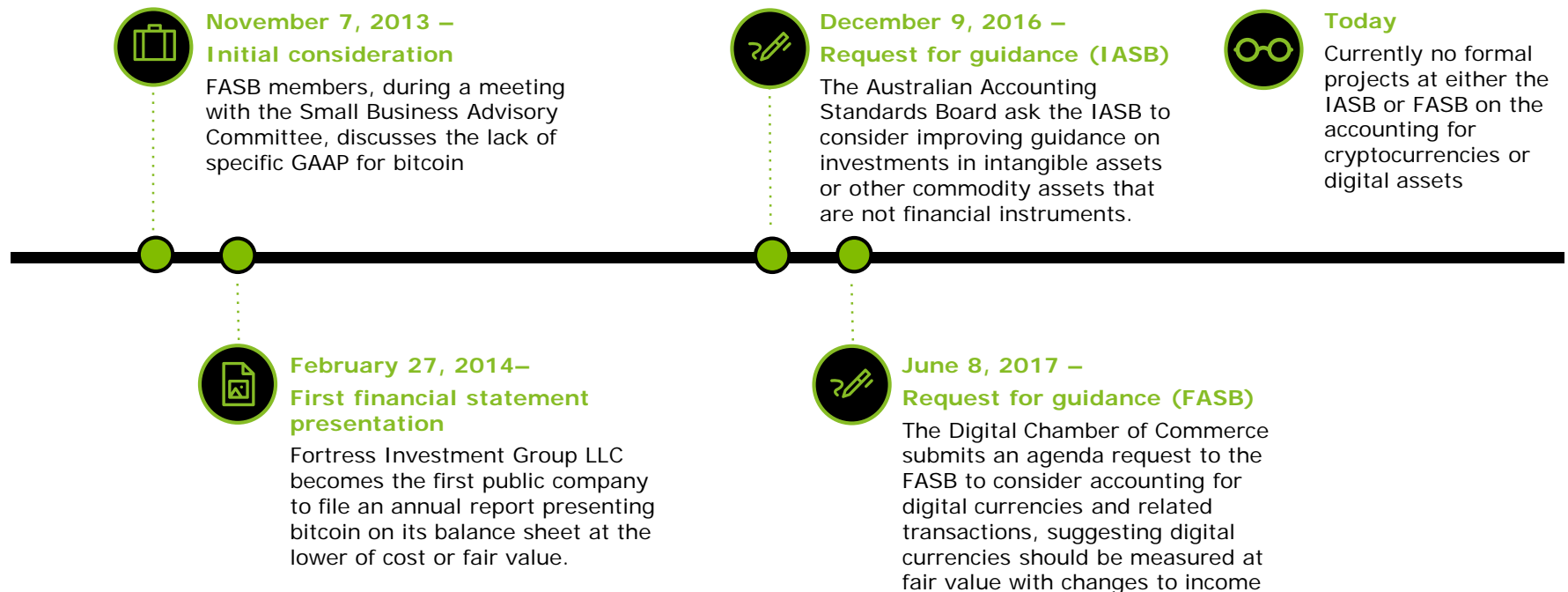
Accounting for digital assets not clear under GAAP

What is the nature of the digital asset?



Accounting standards

Consideration, but no deliberations currently



Contact information

Christina Dorfhuber

Principal
Deloitte Consulting LLP
cdorfhuber@deloitte.com

Prakash Santhana

Managing Director
Deloitte Financial Advisory
Services LLP
psanthana@deloitte.com

Will Bible

Audit & Assurance Partner
Deloitte & Touche LLP
wilbible@deloitte.com

Questions and Answers



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