IDEA

How To Audit Blockchain

Presenters:

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Agenda

1. What is blockchain?
2. How does it work?
3. How could it transform internal and audit?
4. What are the key risks and challenges?
5. Integration into the audit process
6. Industry examples of using blockchain data
7. Useful resources
8. Question & Answers

What is Blockchain?

Blockchain is the **technical solution** behind cryptocurrencies that is now driving a new revolution in computing. Also known as 'distributed ledger' technology' (DLT).

Shared Ledger – Blockchain stores records in 'ledgers' in a **network managed database**

Distributed - Records are stored in blocks of data which are **distributed** (shared) with every computer on the network, so storage is **decentralised**

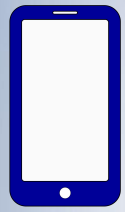
Secure - Each block is encrypted, making it '**incorruptible' 'permanent'** and '**irreputable**' (so cannot be altered)

Consensus (Trust anchor)
All updates, changes and transactions must be validated by **all** participants in the network.

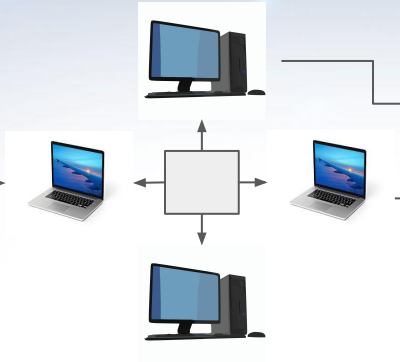
P2P - Blockchain makes it possible to transact direct '**peer to peer**' with no need for intermediaries or banks

Smart Contracts - A computer programme which executes itself when certain terms and conditions are met

How It Works:



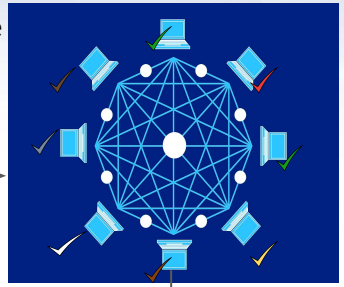
Someone **requests** or initiates a new transaction.



The transaction is **broadcast** to a network consisting of 'nodes' (active device connected to a network) where the nodes can verify the ongoing transaction and the history.

Validation through consensus - All nodes validate the transaction and the user's status using cryptographic algorithms.

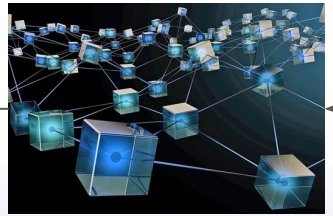
Validators are sometimes known as **miners** and can receive a reward for the service.



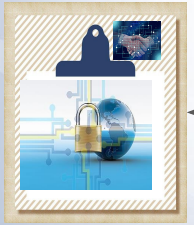
Verified transactions can be new records, payments, digital tokens or just communications. In fact it can be anything of value.

Once verified, the transaction is captured as a **new unalterable block (immutable) using encryption.**

Every ledger entry of blockchain is linked to the previous transaction so that it is **traceable** across its full history.



The new block is **added to the existing block chain** and the chain gets longer. Additions are **immutable** (cannot be altered) so create a **permanent record** of all transactions. This makes blockchain very secure.



The **transaction is complete** and is locked, encrypted and becomes a permanent record that cannot be altered.

The Future is Now

- The solution has the potential to **transform** historic industries and revolutionise how we shop, transact, vote or own things
- The core capabilities of blockchain are **record keeping**, **transfer of value** and **smart contracts**
- Implementations are accelerating in different industries
- Rapid development creating different blockchain types: Public, Private and Hybrid
- The drivers are often common: **reduce cost, create efficiencies, reduce timescales, increase services or improve satisfaction**
- New technology brings risks and opportunities for business and for both internal and external audit

Discussion & Review

IDEA

Blockchain: A Revolution for Audit, Risk and Compliance

- Real time monitoring
- Exception reporting
- Data analytics
- 100% testing
- AI and automation

Data driven **360, 4D, 24/7** assurance:

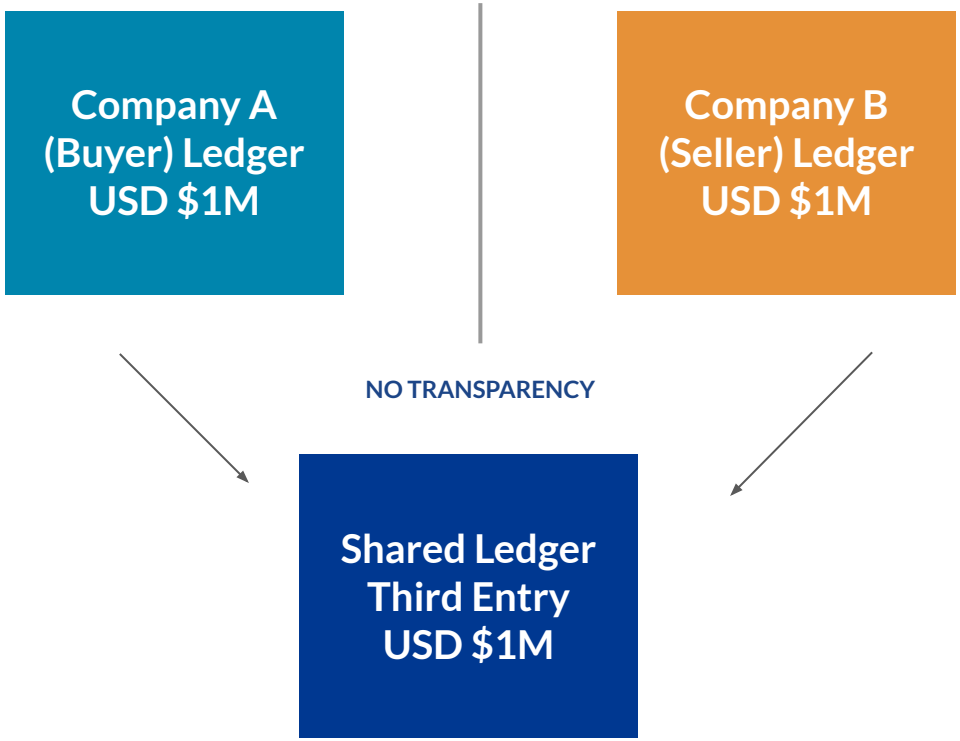
- Direct access via audit nodes
- API tools to extract data
- Data extracts, AI and Automation

- Digital time stamps
- Full history of payments, transfers or owners
- Helps with fraud detection

- Records are transparent, immutable and encrypted
- Secure P2P transfer of ownership, payments or communication
- Fast and automated settlement via Smart Contracts

- **Better targeting of audit effort**
- **Increased 3 lines assurance**
- **Improved efficiency**
- **Greater coverage and value**

How Can Blockchain Transform External Audit?



Triple entry accounting provides:

- Transparency over entries
- Real time information

Shared records helps to:

- Detect errors or fraud
- Reduce need for reconciliation
- Simplify intercompany transactions
- Avoid need to verify balances
- Valuations are easier
- Creates time for value-add activities

Risks & Challenges of Blockchain

ACCESS

DATA SECURITY

IMPLEMENTATION

IT	OPERATIONAL	COMPLIANCE	REPORTING
• ITGC • CYBER • Data Governance • Data Ownership • Data Security • Data Storage • Resilience • Data retention • Data archiving • Data Removal • IT change & implementation • Key management	• Fraud • Supplier Management • P2P & B2B payments in crypto currency • Conduct • Patent management • Regulatory approvals • Product development • Procure & pay • Policy • Governance	• Data privacy • Right to forget • AML • Sanctions • KYC • Source of Wealth • ESG • H&S • Product comments, content or ingredients	• Valuation & reporting of digital assets & currencies • Existence of digital assets & NFT's • Ownership of NFT's or other physical assets • Integration into accounting processes & systems
DATA LOSS	GOVERNANCE	SANCTIONS / AML	COMPLIANCE

VALUATION

REPORTING

PRIVACY

Risks & Challenges of Blockchain

RISK ASSESSMENT

Updating Risk libraries and scoring tools for risk assessment
Mapping blockchain solutions to auditable entities
Identifying change projects which involve blockchain
Identifying suppliers who use this technology and understanding where business data is held
Monitoring changing customer behaviour, company policy or external threats caused by competitor behaviour
Including new data sources in analytics, compliance or other strategies

FIELDWORK

Adapting audit work programmes to include risks and test methods for digital assets
Including new risks within existing work e.g. ITGC to add in new tests e.g. management of keys
Updating tools, training and test methods
Leverage transaction data and full history to deliver multiple test objectives from one data source or transaction history
Making more use of analytics, AI and automation to test 100% population

REPORTING

Monitoring developing accounting policies and reporting requirements in different jurisdictions
Developing feeds from new solutions to support data visualisation or real time monitoring
Explaining technology risks and opportunities to clients, stakeholders, execs and audit committees
Developing guidance which busts myths or misunderstandings on difference between using crypto currencies and distributed ledger solutions

CONSIDER

- Direct Impacts
- Indirects Impacts
- Threats
- Opportunities

THINK

- Recruitment
- Training
- Use of Co-Source
- Data Tools
- Charter
- Methodology
- Guidance

ACT

- Be Proactive
- Build in Small Steps

Case Study - Trade Finance

INTERNATIONAL TRADE

Letters of credit support approximately 15 percent of merchandise trade globally - **$2.5 Trillion annually**

The LC has been around for over 100 years to mitigate trade risks and provide working capital

LC's are complex, paper based, slow and costly

Shipment Details	Parties Involved	Goods	Documents	Financial Information
Shipment Id Shipment date Name of Vessel Shipping line Freight forwarder	Shipper name Shipper address Importer name Importer address Remitter	Description Classification Country of origin Packaging Weight	Bill of lading Certificate of origin Packing list Invoice Payment Order	Currency of LC Value of LC Payment terms Payment due date Issuing Bank

OPERATIONAL

- Smart contracts drive workflow to make payments when criteria met
- Automated document checking and exchange
- Secure communications

COMPLIANCE

- Automated sanctions and AML checks
- Data gathering and reporting for ESG goals

RISK

- Real time monitoring against risk appetite measures

AUDIT

- Implementation on current systems
- 100% transaction testing
- ITGC controls testing
- Encryption key management
- Access management
- Developing data feeds to ledgers and financial statements
- Valuation of crypto balances

Case Study - Pharmaceutical

PHARMALEDGER

Pharmaceutical companies, hospitals, universities, patient organisations and technology companies

Consortium

29 partners

Budget

22 Million Euros

Duration

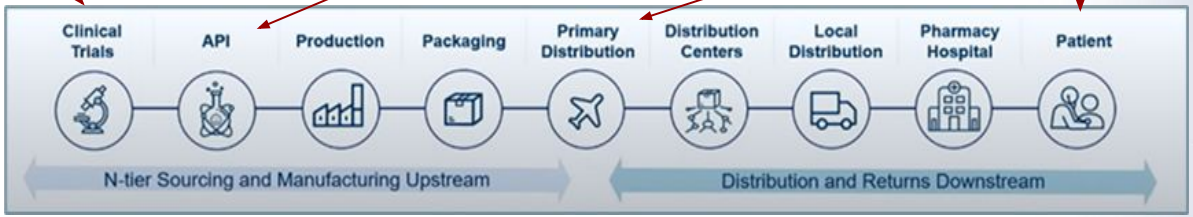
Jan 20 to Dec 22

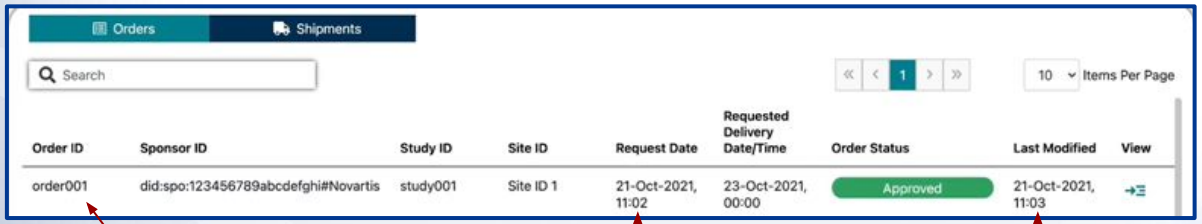
- Regulatory approvals
- Existence of patents
- Patient consent
- Completeness and integrity of trial data

- ITGC
- Disaster recovery
- Data storage
- Cyber defences
- Data governance

Checking compliance with ESG goals

Checking Consent and who has access to records





Shipment Details	
Batch number:	10
Consignment number:	111
Product name:	paracetamol
Package size:	40
Distributor name:	Anuj
Transporter name:	Sam
Vehicle reg number:	89707
Date of dispatch:	2020-01-03
Submitted on:	2020-01-07 09:32:13

Matching Orders to goods received in financial ledgers

Using site data for stock control and inventory

Checking approvals to company authorities

Case Study - Retail

RETAIL

Walmart:
265 million customers
11,200 stores,
$43 billion ecommerce.
Retailers rely on an efficient global supply chains to stock their shelves just-in-time. Walmart thought blockchain technology might be a good fit for the **decentralized food supply ecosystem.**

Quality Control

Financial Records

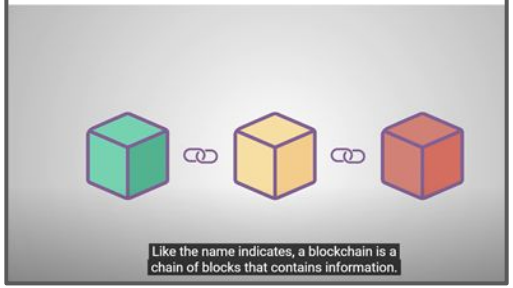
- Traceability - Reviewing documents proving the authenticity of products
- Compliance - ensuring safe handling of food and other perishables
- ESG – Checking sustainable, ethical, and organic sourcing of materials

- Theft/fraud – analysing trends and checking controls operate
- Supplier Audits – checking service levels using data
- Tax – Using data to verify duties and taxes are paid

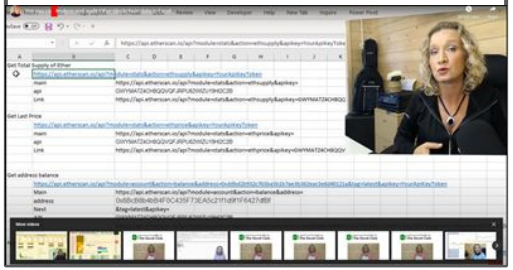
- Matching procurement orders to invoices and payments
- H&S – ensuring faulty goods are traced and recalled
- Resilience – using data to identify single points of failure or over reliance on countries, ingredients, suppliers etc

Blockchain Resources

How Does Blockchain Work?



Using Excel to Audit Blockchain



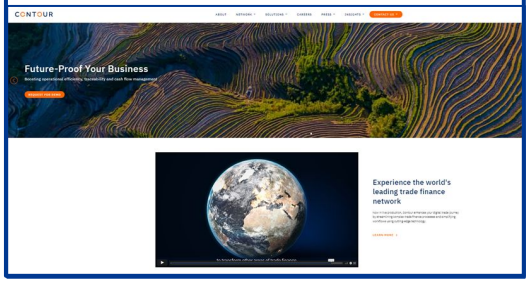
World Economic Forum

Triple Entry Accounting

The Blockchain Resources (Part 1: Understanding Blockchain Technology)

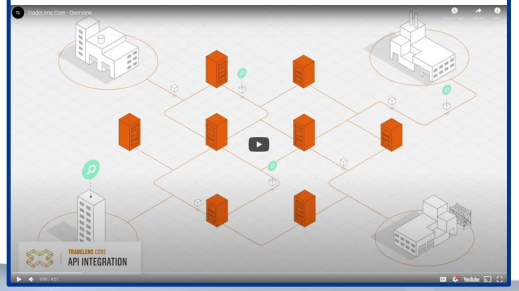
Buying an item in a shop (BBC)

Contour solution for trade finance

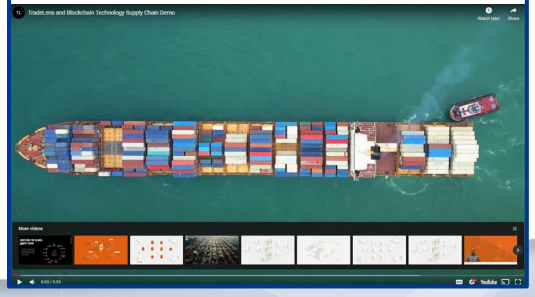


The Hyperledger Foundation

Tradelense Helps Supply Chains



TradeLens Blockchain Technology Supply Chain Demo



Learn How blockchain Works with this PharmaLedger Video

Questions?

Thank You

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