

Tokenizing assets on a blockchain

Presented by



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The EY logo, consisting of the letters 'EY' in a bold, white, sans-serif font. A yellow triangle is positioned above the 'Y'.

Building a better
working world

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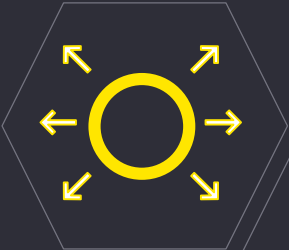
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Blockchain core concepts

The non-technical version ...

Blockchain is a **distributed ledger technology** — it maintains an ordered list of transactions that occur between members of a **network** which enables a **decentralized** ledger of trusted data — a **shared record book**

Decentralized



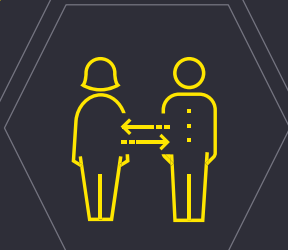
Consensus



Protocols



Smart contracts



Transactions



Distributed ledger



Hashing



Tokenization

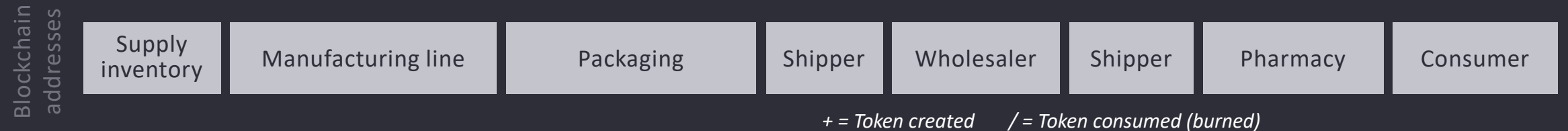
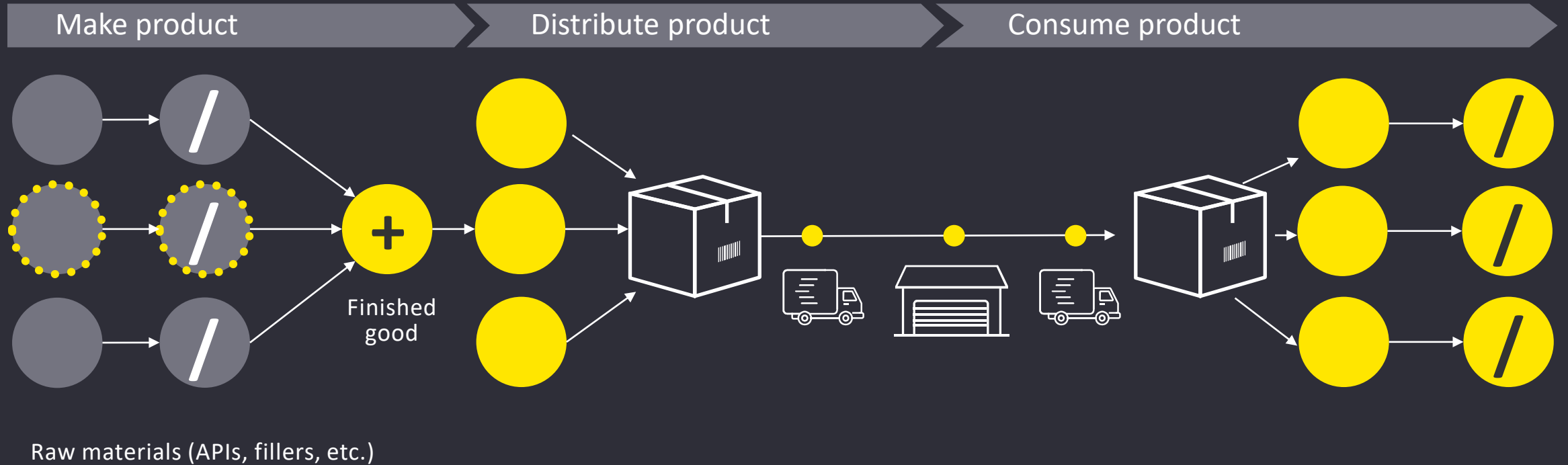
Tokenization video



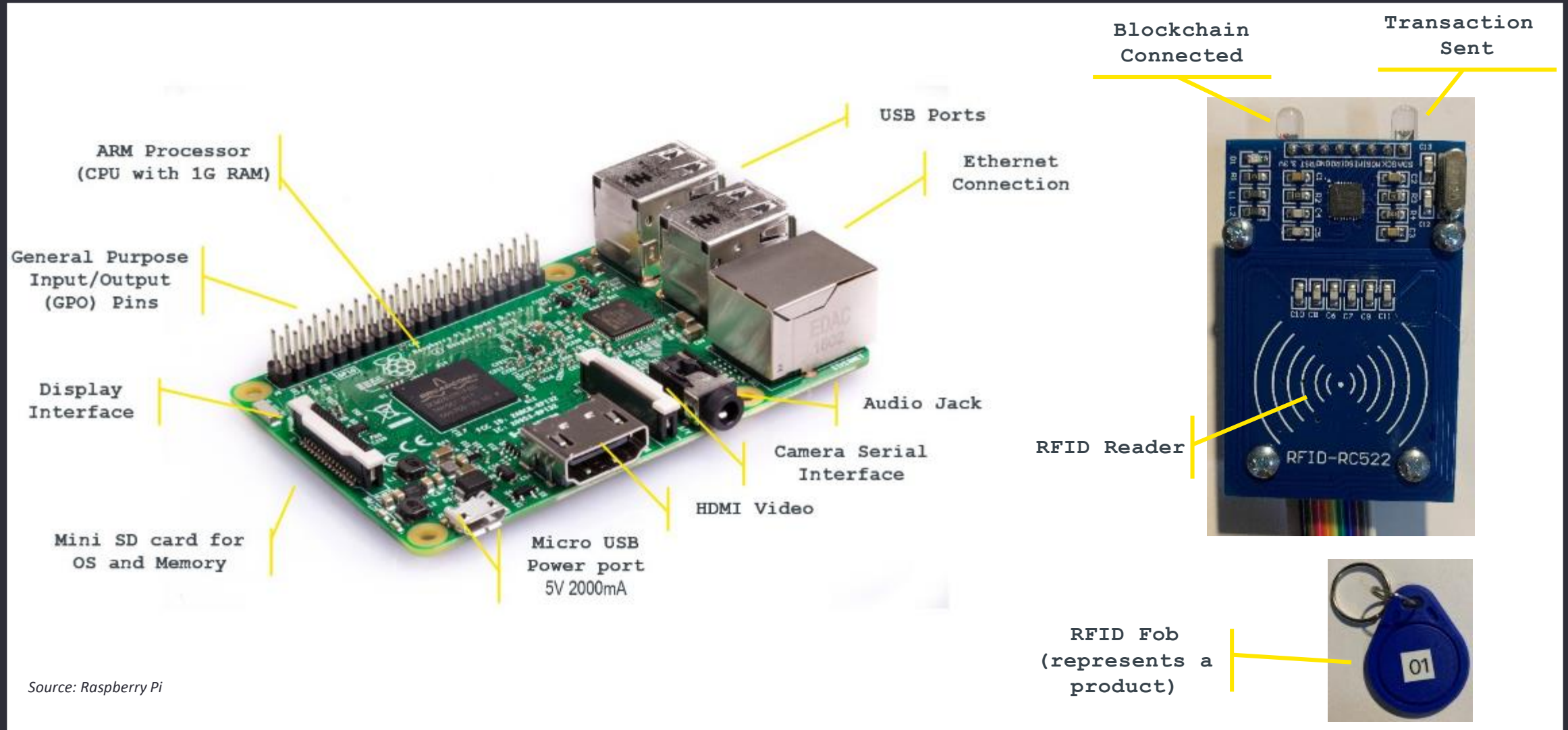
Tracking tokenized assets on the blockchain

Creating transparency into the supply chain for drugs and devices

Example of a token strategy design



Demo equipment: anatomy of a Raspberry Pi 3B



Raspberry Pi demo

Some technical stuff

- ▶ Spin up a fresh Ethereum Proof of Authority (PoA) network
 - ▶ Create a 3-node cluster on the Macintosh
 - ▶ Create participant nodes on Raspberry Pi A, B and C
 - ▶ Unlock all of the accounts (relax this is only a demo ...)
- ▶ Deploy the openzeppelin ERC-721 contract
 - ▶ Sync the contract address to the Raspberry Pis
- ▶ Mint 10 non-fungible tokens to represent products assigned to predefined RFIDs
- ▶ Approve Raspberry Pi accounts to receive the tokens
- ▶ Transfer the 10 tokens to Raspberry Pi A
- ▶ Trigger the transferFrom () function of ERC-721 when an RFID token is scanned by a Raspberry Pi
- ▶ See what happens ...

Common use case categories

Notary systems:

Using the blockchain to notarize digital documents allowing the user to “prove” that a document/data existed at a specific point in time in the past

Examples:

Capturing consent:

Combining digital identity with transactions that document someone giving or revoking consent

Certifications:

Signed certificates from reputable sources (e.g., college degrees)

Value exchange:

Using tokens to represent value and exchanging those tokens between parties using blockchain as the common source of truth

Examples:

Cryptocurrencies:

Creating programmable money that is used to settle accounts between parties

Tokenized assets:

Representing physical assets on a blockchain and tracking their movements via smart contracts and transactions

Not-yet-common life sciences use cases

Token curated registries (TCRs):

Using a public blockchain to maintain an accurate list of public information with a cryptocurrency incentive to correct errors (e.g., shipping addresses or public contact info)

Decentralized autonomous organizations (DAOs):

Leveraging a voting system in conjunction with a prediction market to facilitate scalable — yet resilient — collective decision-making

Do you need a blockchain for that?

We have a five-point test for viability

1 **Are there multiple parties in this ecosystem?**
Blockchains get more secure with more parties in the network. One-participant networks are not especially secure.

2 **Is establishing trust between all the parties an issue? Or disparate data systems feeding shared info?**
Blockchains improve trust between participants by having multiple points of verification and can work on data fed from disparate systems.

3 **Are we securing the ownership or management of a finite resource?**
Core logic in the system is designed to prevent double counting of assets and record ownership and transfers.

4 **Do all the parties need to work with shared, complex business logic?**
Smart contracts can handle very complex logic and be customized for each relationship.

5 **Does this ecosystem benefit from improved transparency?**
Data shared on a blockchain is public to all network participants.
Future encryption methods will enable participants to verify data accuracy without viewing transaction details.

“an ‘a’ with a ring around it”
Comments on blockchain maturity



Clip from 1994 Today Show
explaining the internet ...

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