NEW KIDS ON THE BLOCK (CHAIN)

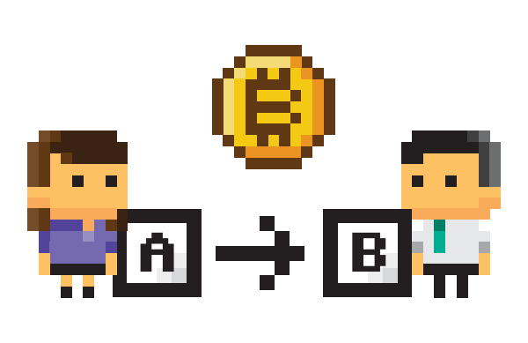
BLOCKCHAIN BEYOND BITCOIN

HOW DOES BLOCKCHAIN WORK?

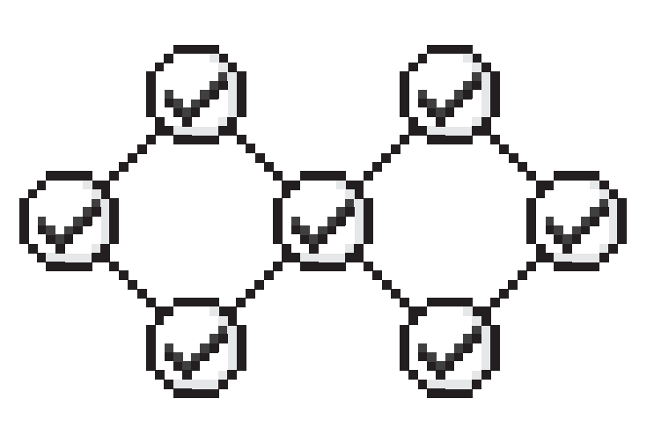
BLOCKCHAIN TRANSACTION

e.g. BITCOIN

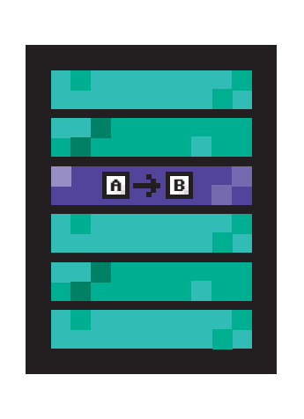
Customer 'signs' a transaction request using his or her private key ①



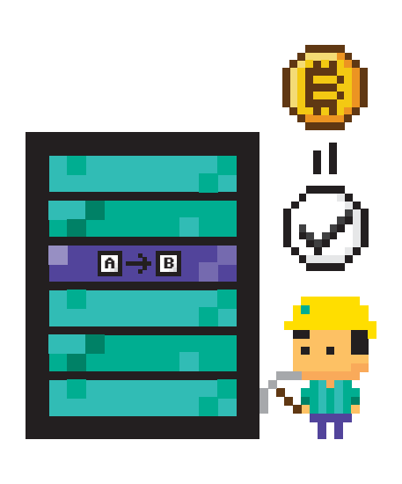
Transaction is broadcast to and verified by the whole network ②



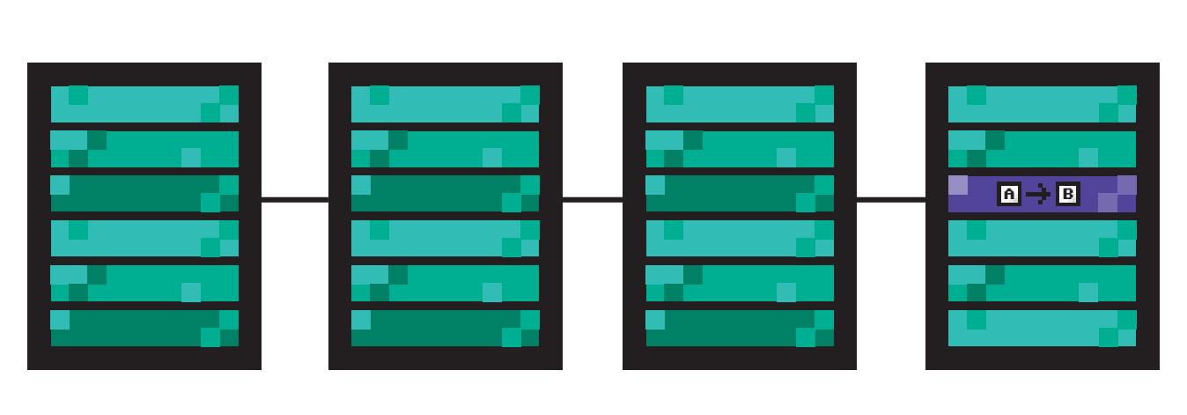
Individual transactions are added to a block ③

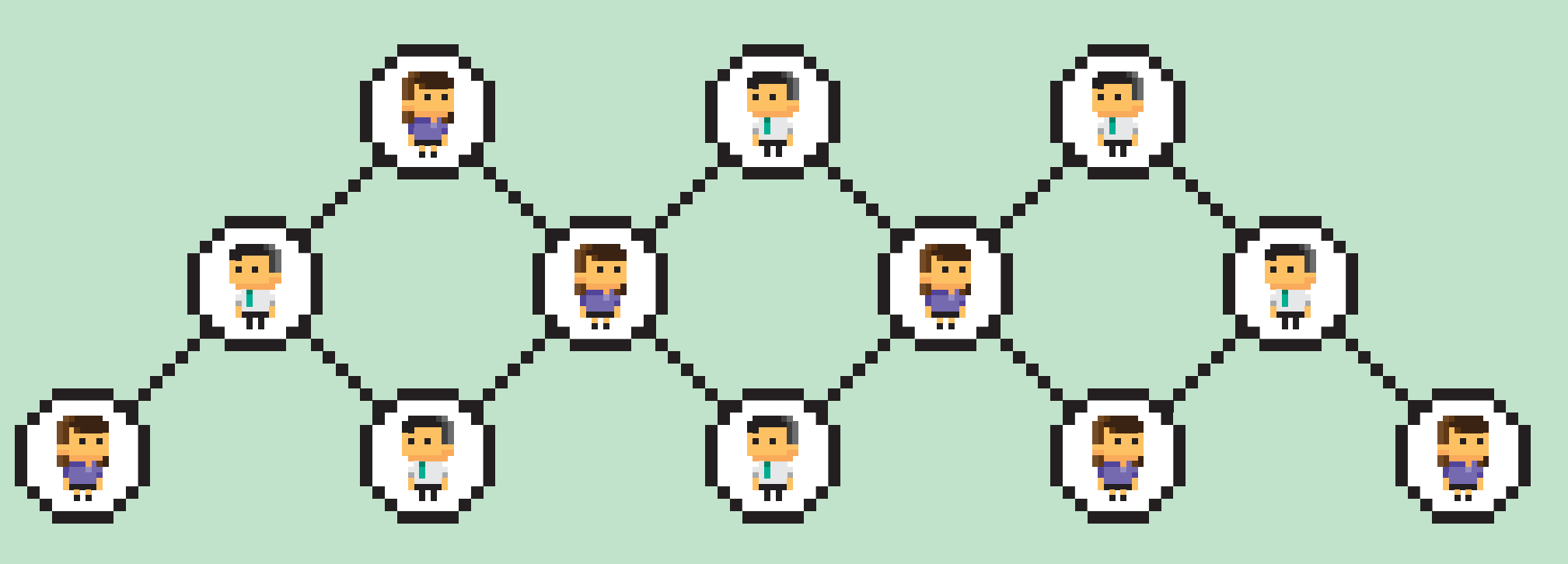


Miners follow a set of rules to verify each block, motivated by a built-in incentive ④



Verified blocks are added to the blockchain as a permanent record ⑤

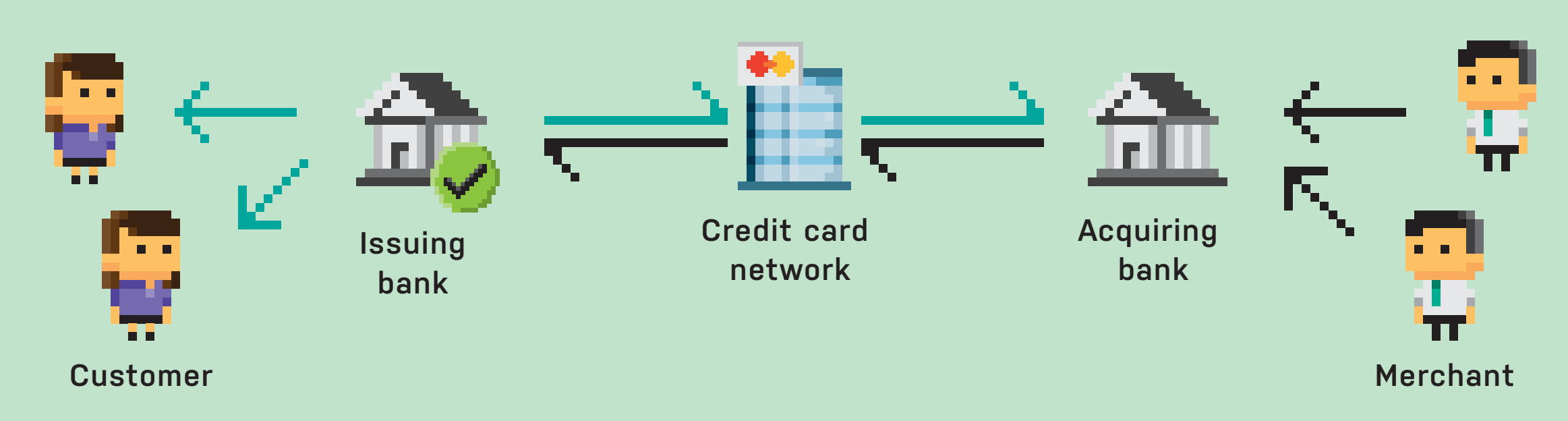




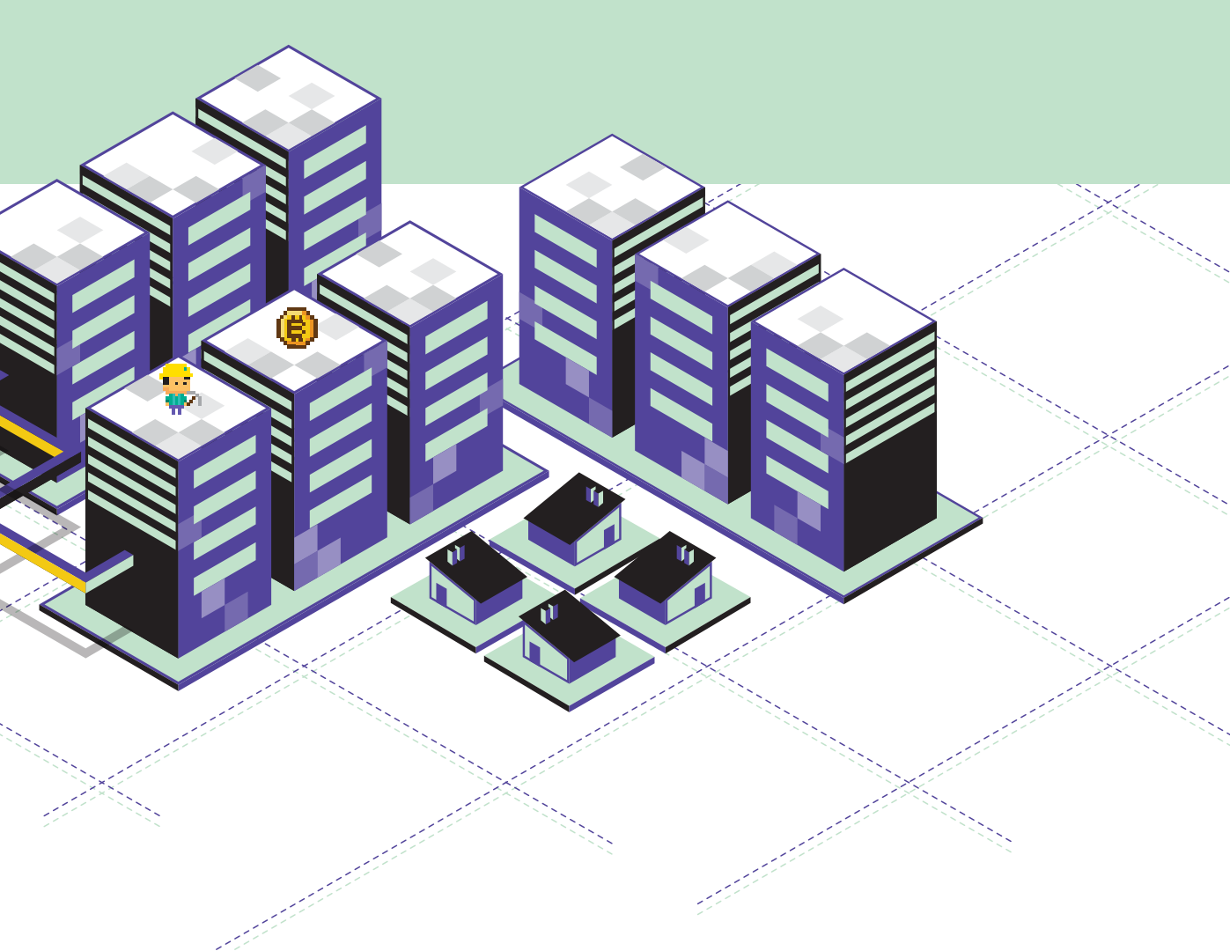
BLOCKCHAIN

VS

TRADITIONAL TRANSACTION



	Traditional e.g credit card	**Blockchain**
Network	Centralized, vulnerable to attack	Decentralized
Intermediaries	Many, each charging a service fee	None
Privacy	Identity and credit history disclosed	Privacy retained, only public key disclosed



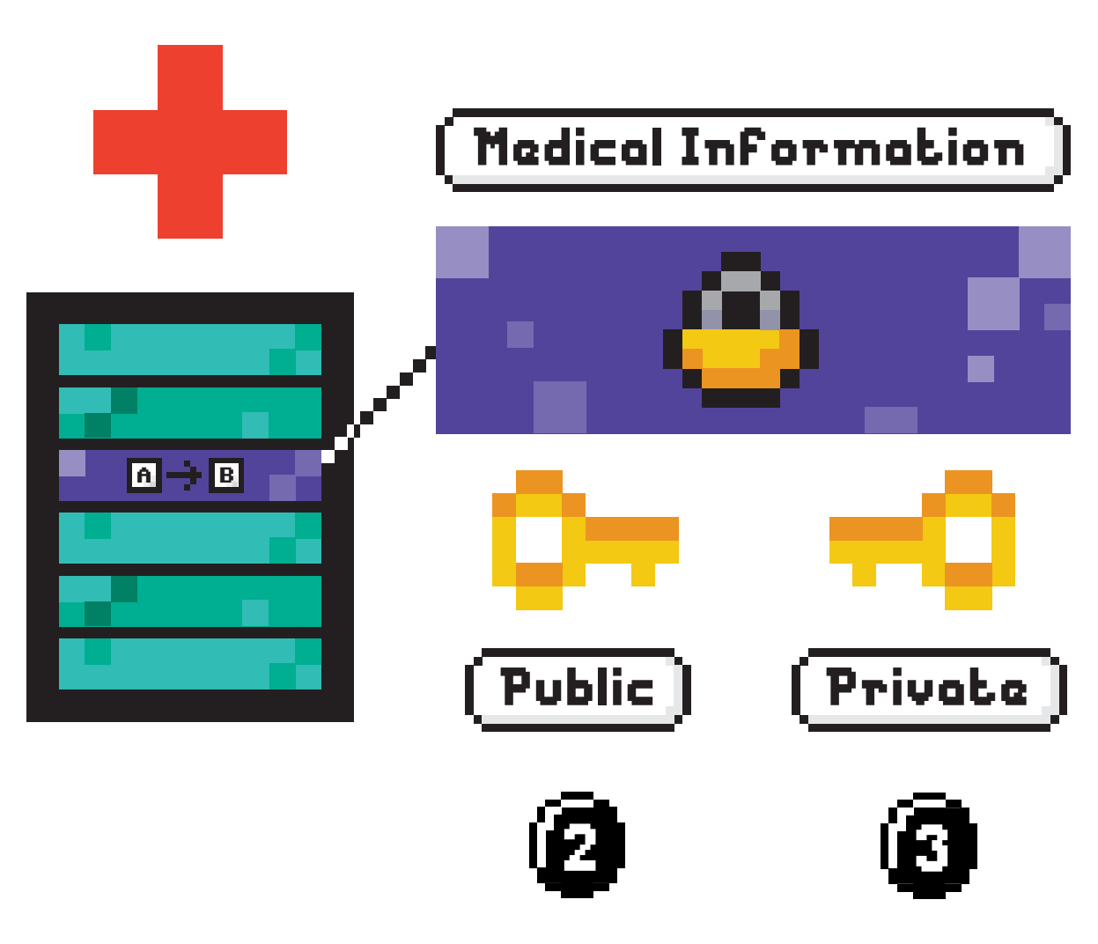
HOW IS BLOCKCHAIN USED?

ELECTRONIC HEALTH RECORDS

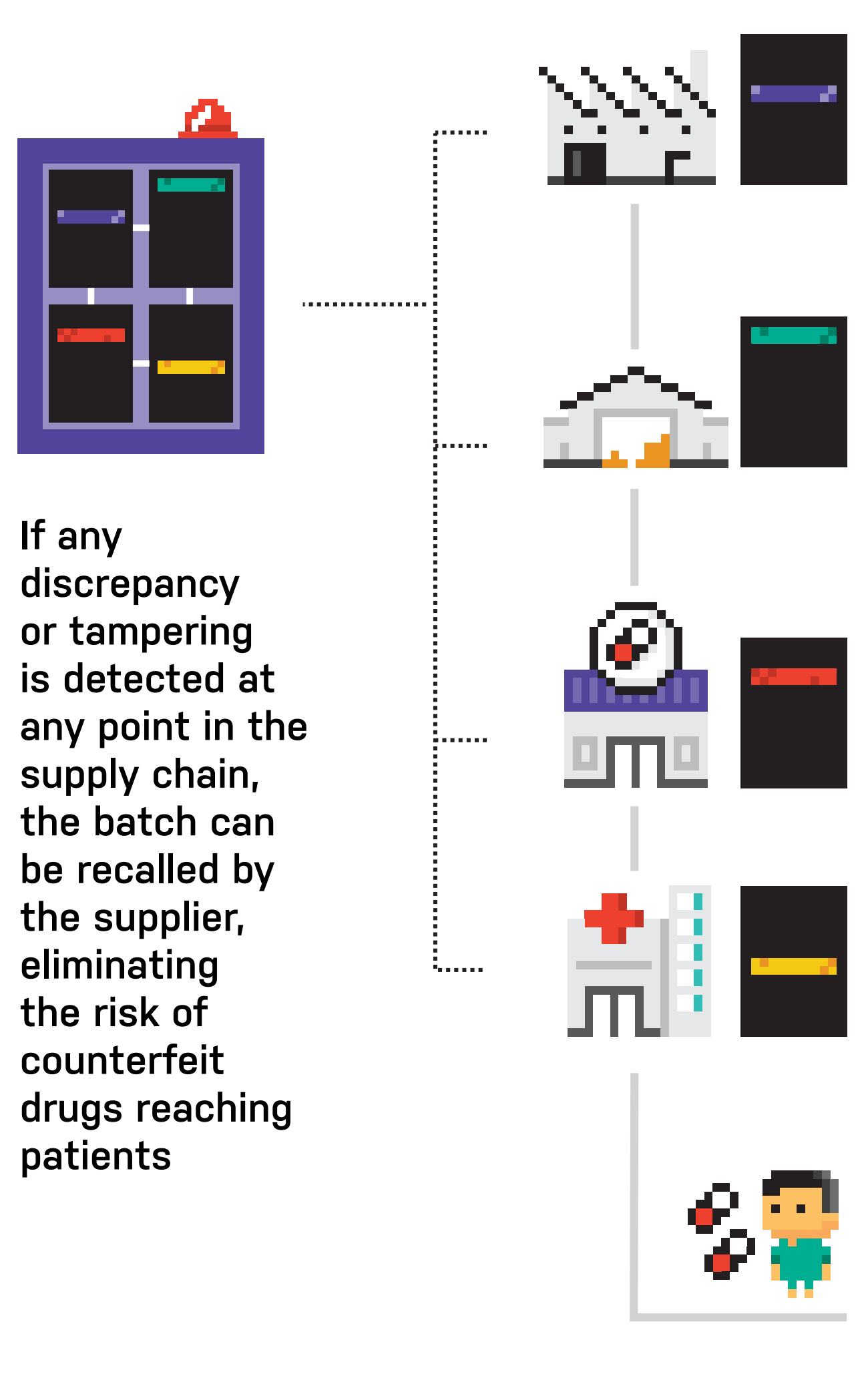
① Instead of transactions, the blockchain can be used to store medical information

② Health authorities and hospitals can query non-identifiable patient data to gain population-level clinical insights

③ Individuals can choose to share their private key to grant their physician full access to their complete health record



PHARMACEUTICAL SUPPLY CHAINS



If any discrepancy or tampering is detected at any point in the supply chain, the batch can be recalled by the supplier, eliminating the risk of counterfeit drugs reaching patients

① Supplier dispatches a batch of drugs geo-tagged with RFID technology. Dispatch details such as time, location and real-time tracking data are recorded on a blockchain

② Central warehouse verifies batch origin and registers receipt on the blockchain

③ District pharmacy verifies batch origin and registers receipt on the blockchain

④ Hospitals and clinics verify batch origin and registers receipt on the blockchain

⑤ Patients can be certain of the authenticity of the drugs dispensed to them

LAND TITLING

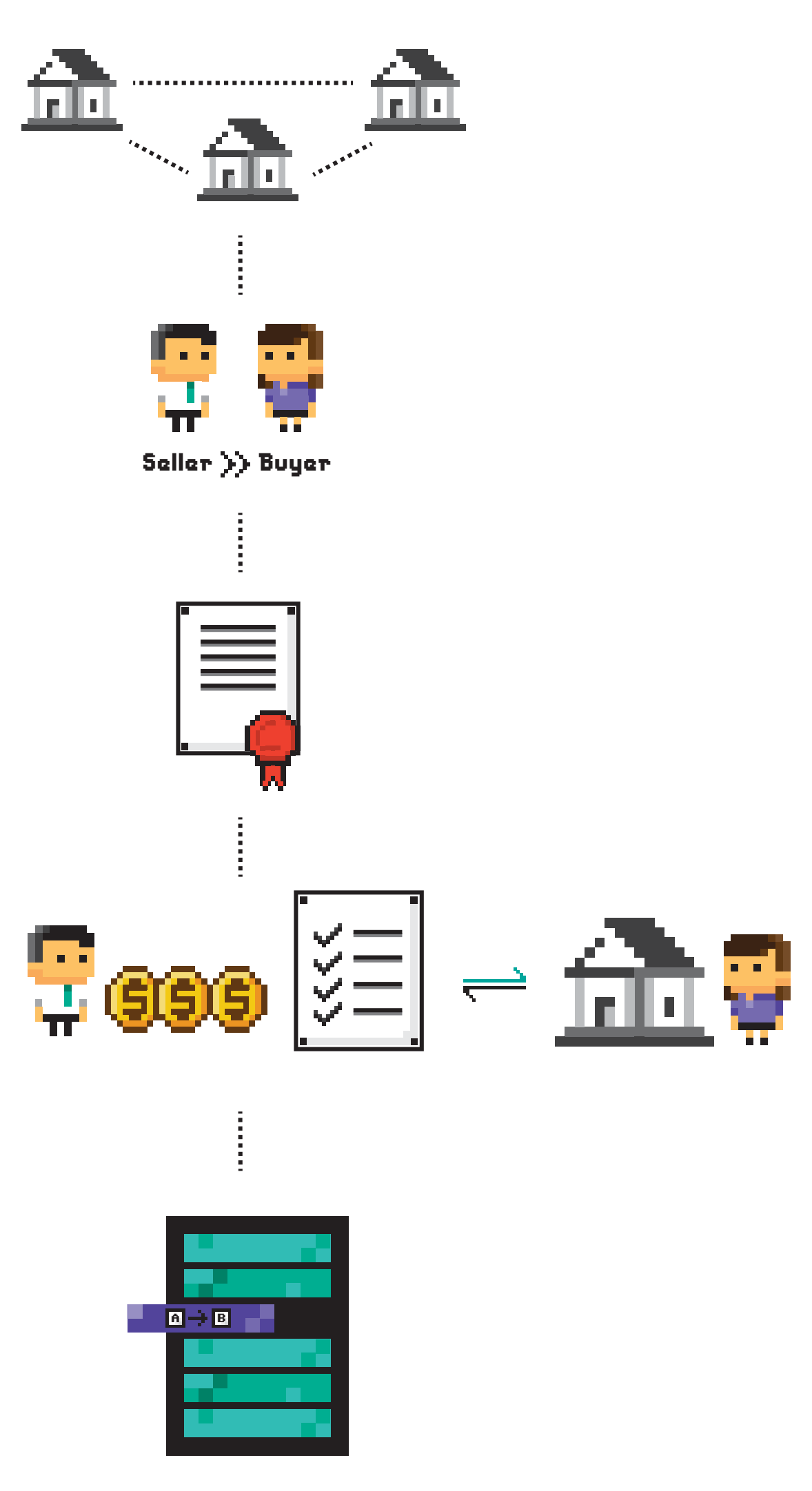
Land titles are recorded on a blockchain ①

In the event of a transfer of ownership, a citizen initiates the transaction ②

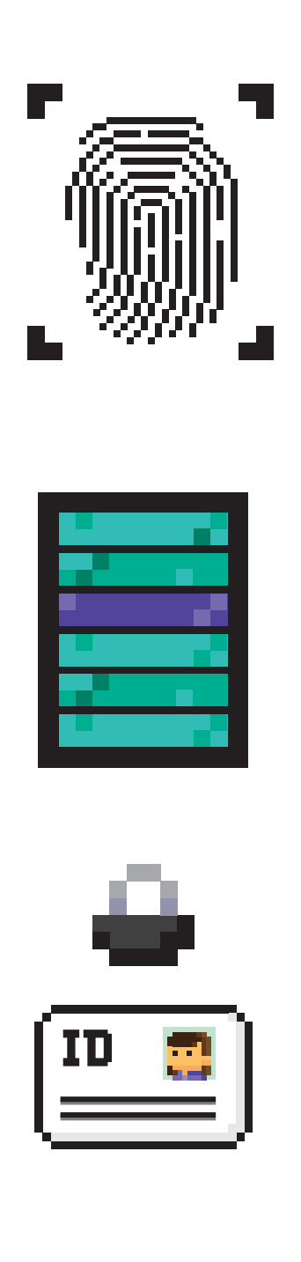
A smart contract is generated on the blockchain containing information about current ownership, sale value, new owner details, etc ③

Once the terms are met, the blockchain automatically executes the contract and transfers ownership of the property ④

Transaction becomes part of the blockchain record ⑤



IDENTITY



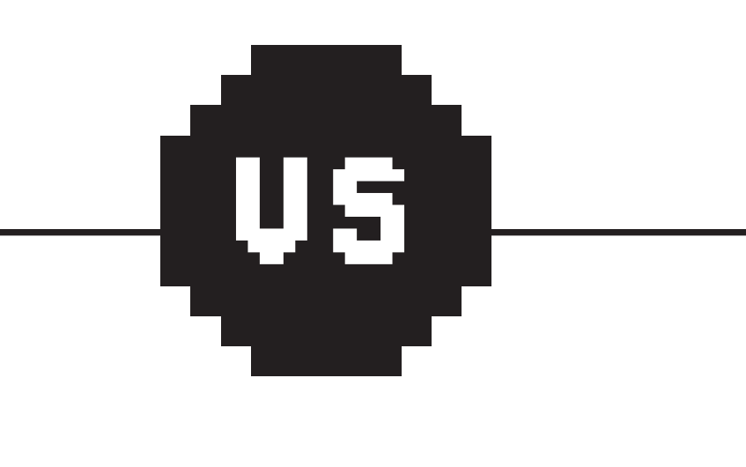
① Biometric data (e.g. fingerprints) is generated

② Biometric data is recorded on the blockchain

③ Private, portable and persistent records of personal identities on the blockchain cannot be revoked or deleted

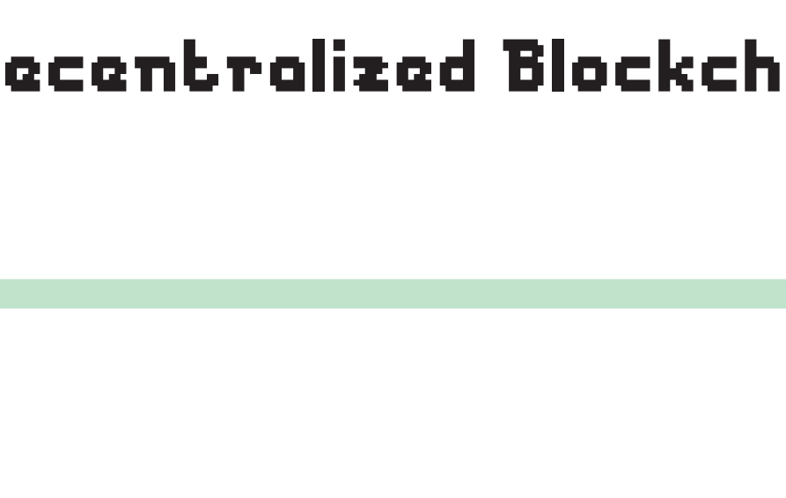
CYBERSECURITY

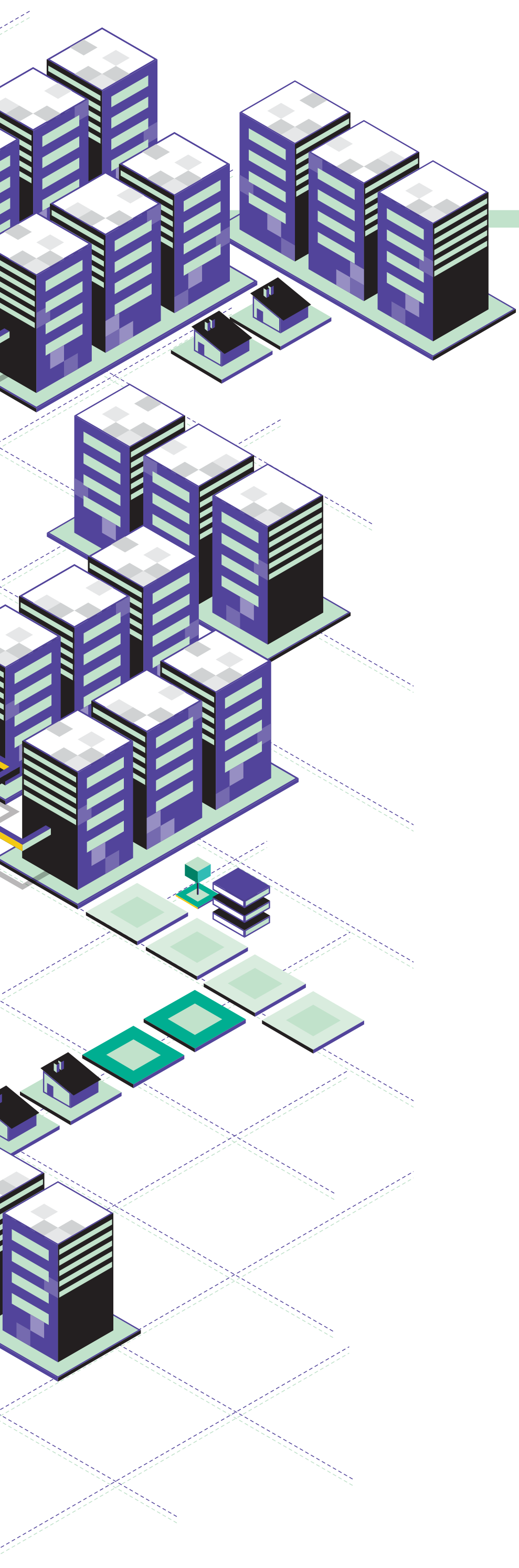
Centrally managed SSL certification is a single point of failure and vulnerable to hacking



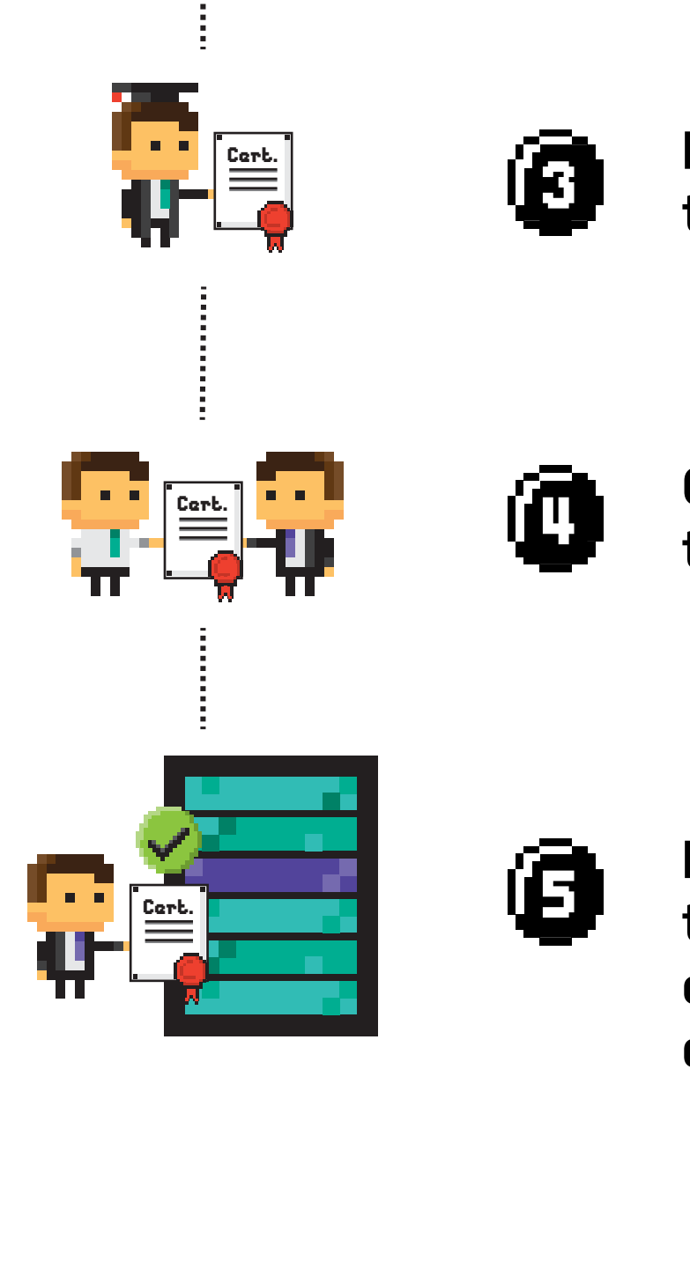
VS

SSLs registered on decentralized blockchains make it impossible to steal or falsify certificates





EDUCATION



① Graduate requests for certificate for employment interview

② School issues certificate signed with a private key, and the record is registered on the blockchain

③ Digital certificate is sent to the graduate

④ Graduate submits certificate to potential employer

⑤ Employer can independently verify the certificate's authenticity by comparing it against transaction data stored on the blockchain

ASIANSCIENTIST