

DEMOCRACY AT RISK: EU POLITICS IN THE 21ST CENTURY



UNIVERSITY OF PELOPONNESE

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TODAY'S DISCUSSION



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- What Blockchain is
- Databases vs Blockchain
- Blockchain Use Cases
- Smart Contracts
- Blockchain Digital Wallets

BLOCKCHAIN

WHAT IS IT?



Blockchain is a decentralized and distributed ledger technology. Unlike traditional centralized databases where data is stored in a single location, a blockchain operates on a network of computers (nodes). Each node maintains a copy of the entire blockchain ledger, creating redundancy and reducing the risk of a single point of failure.

In a blockchain network, there is no central authority or intermediary. Instead, transactions are validated and added to the ledger through a consensus mechanism, *often* involving network participants (nodes) reaching an agreement.

BLOCKCHAIN

WHAT IS IT?



In a blockchain, data is grouped into blocks, with each block containing a batch of transactions. Think of a block as a page in a ledger.

Blocks are linked together in a chronological order, forming a chain. This chain of blocks gives blockchain its name.

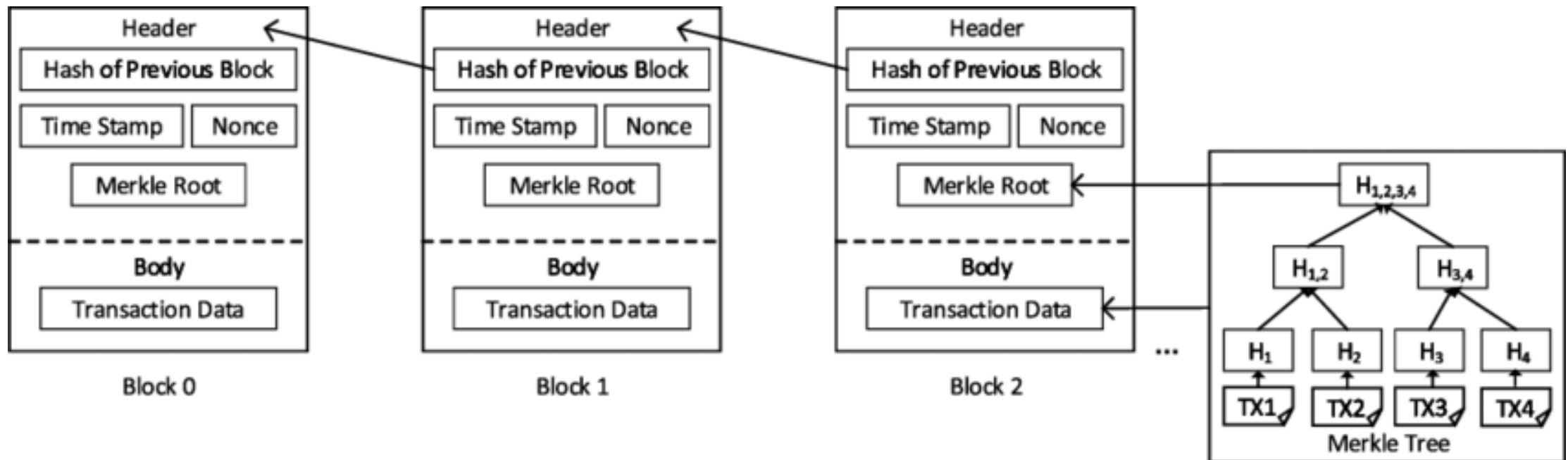
The linking of blocks is achieved through cryptographic hashes, which are unique identifiers generated from the contents of the previous block. This ensures the integrity of the data and prevents unauthorized tampering.

BLOCKCHAIN

WHAT IS IT?



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Source: Ying-Chang Liang, Blockchain for Dynamic Spectrum Management (2020). DOI: 10.1007/978-981-15-0776-2_5

BLOCKCHAIN DATABASE VS BLOCKCHAIN



	Traditional Databases	Blockchain
Data Storage	Single Location	Many Nodes (computers)
Control Authority	Central	Control is given to the "people" (nodes)
Trust	In Central Authority	In Each Other - Established through Cryptographic Algorithms and Consensus Mechanisms

BLOCKCHAIN DATABASE VS BLOCKCHAIN



	Traditional Databases	Blockchain
Speed	Typically Faster	Slower for high-frequency transactions
Use Cases	Traditional Business Applications (<i>e.g., bank</i>)	Ideal for applications requiring trust, transparency, and security
Data Ownership and Privacy	Database Owner	Defined by Blockchain Protocols

BLOCKCHAIN

BENEFITS OF DECENTRALIZATION



Security: Decentralization makes it extremely difficult for a malicious actor to alter the data in a blockchain. To tamper with one block, they would need to control the majority of the network, which is highly improbable in well-established blockchain networks.

Transparency: All participants in the network can view the blockchain's contents, enhancing transparency. Transactions are visible to anyone but pseudonymous, often identified by unique addresses.

Immutability: Once data is added to the blockchain, it is nearly impossible to change or delete it. This immutability is a key feature of blockchain technology.

BLOCKCHAIN USE CASES



Supply Chain

Traceability: Blockchain enables end-to-end traceability of products in the supply chain. Companies can record every stage of a product's journey from raw materials to delivery, ensuring transparency and authenticity.

Authenticity: It helps combat counterfeiting by verifying the authenticity of products. Consumers can scan QR codes or use apps to verify product origins.

BLOCKCHAIN USE CASES



Food Safety

Tracking Food Origins: Blockchain helps track the origins of food products, making it easier to identify and recall contaminated items.

BLOCKCHAIN USE CASES



Healthcare

Patient Records: Blockchain can securely store and manage patient records, ensuring data integrity and privacy. Patients have control over who accesses their health data.

Drug Traceability: Similar to supply chain, blockchain can track pharmaceuticals from production to distribution to ensure the legitimacy of drugs and reduce the circulation of counterfeit medications.

BLOCKCHAIN USE CASES



Voting Systems

Secure (Remote) Elections: Blockchain can enhance the security and transparency of election systems. Votes can be securely recorded, and the results can be audited by anyone with access to the blockchain.

BLOCKCHAIN USE CASES



Cross-Border Payments

Fast and Cost-Effective: Blockchain simplifies cross-border transactions by reducing the number of intermediaries and enabling quicker and more cost-effective transfers.

BLOCKCHAIN USE CASES



Real Estate

Property Records: Blockchain can streamline property transactions by securely recording and transferring property titles. This reduces fraud and simplifies the buying and selling process.

BLOCKCHAIN USE CASES



Intellectual Property

Copyright Protection: Artists and creators can use blockchain to timestamp their work, proving its originality and ownership.

BLOCKCHAIN USE CASES



Energy Trading

Peer-to-Peer Energy Trading: Blockchain facilitates the direct trading of energy between producers and consumers in a decentralized grid

BLOCKCHAIN USE CASES



Education

Credential Verification: Academic credentials and certificates can be securely stored on a blockchain, allowing for easy and tamper-proof verification.

BLOCKCHAIN USE CASES



Political Campaign Financing

Transparent Donations: Blockchain can be used to track campaign donations transparently. This ensures that donations are legal and compliant with campaign finance laws.

BLOCKCHAIN USE CASES



Public Records and Accountability

Government Documents: Public records and government documents can be securely stored on a blockchain, making them tamper-proof and easily accessible to citizens.

Public Spending: Blockchain can provide transparency in government spending, allowing citizens to track how public funds are allocated and used.

BLOCKCHAIN USE CASES



Policy and Legislation

Transparency in Lawmaking: Blockchain can be used to track changes and versions of proposed legislation, ensuring transparency in the lawmaking process.

Smart Contracts for Policy Implementation: Smart contracts can automate policy enforcement, ensuring that policies are executed as intended.

BLOCKCHAIN USE CASES



Civic Engagement

Direct Democracy: Blockchain can facilitate direct citizen participation in decision-making processes through secure and verifiable voting mechanisms.

Transparency in Public Feedback: Citizens can provide feedback on government initiatives or policies in a transparent and traceable manner.

BLOCKCHAIN VIDEO



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Πανόραμα Επιχειρηματικότητας 2019: Blockchain: ένας νέος θαυμαστός κόσμος

BLOCKCHAIN SMART CONTRACTS



Smart contracts are self-executing contracts with the terms of the agreement directly written into lines of code. They run on blockchain technology and automatically enforce, facilitate, or verify the negotiation or performance of a contract, making them a fundamental component of blockchain-based applications.

BLOCKCHAIN SMART CONTRACT - USE CASES



Payment Confirmation

In a supply chain scenario, a smart contract can be programmed to release payment to a supplier automatically once the goods are delivered and confirmed in good condition. This is based on real-time data from sensors or tracking devices.

BLOCKCHAIN SMART CONTRACT - USE CASES



Insurance Payout

Smart contracts in the insurance industry can automatically trigger payouts when certain conditions are met. For example, in the case of flight insurance, the contract can release compensation if a flight is delayed beyond a specified time.

BLOCKCHAIN SMART CONTRACT - USE CASES



Royalty Payments

For creators in the entertainment industry, smart contracts can automate royalty payments whenever their content is used or purchased. This ensures that artists receive their fair share of revenue.

BLOCKCHAIN

BLOCKCHAIN DIGITAL WALLET



A Blockchain Digital Wallet allows the user to store, manage, and interact with their-blockchain-based assets, including digital ID, driver's license, university diplomas and certificates, medical records, property titles and land records and cryptocurrencies.

Selective Disclosure: A Blockchain Digital Wallet provides its user with selective disclosure capabilities. This means users can choose what specific information they want to share in each transaction.