



# Components of a Blockchain Network

Welcome to Unit 4 of our FINTECH AND FINANCIAL ANALYTICS course, focusing on blockchain technology. Today, we'll delve into the intricate components that make up a blockchain network.

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# Recap: Key Takeaways from Previous Presentation

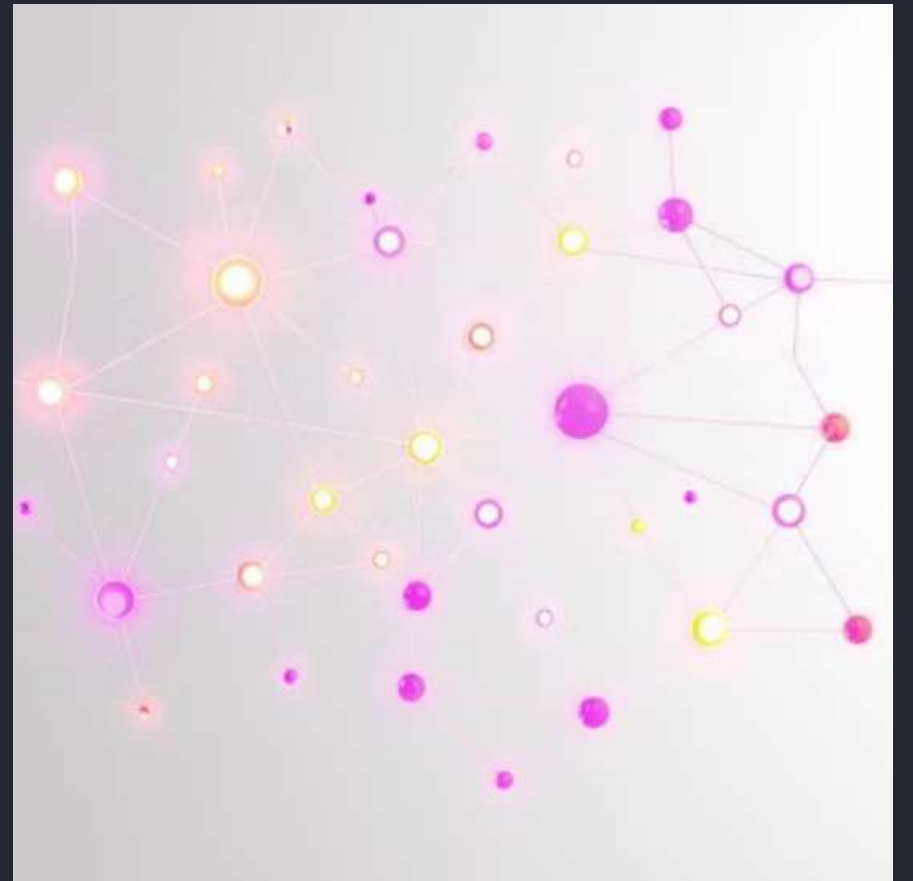
## Types of Blockchains

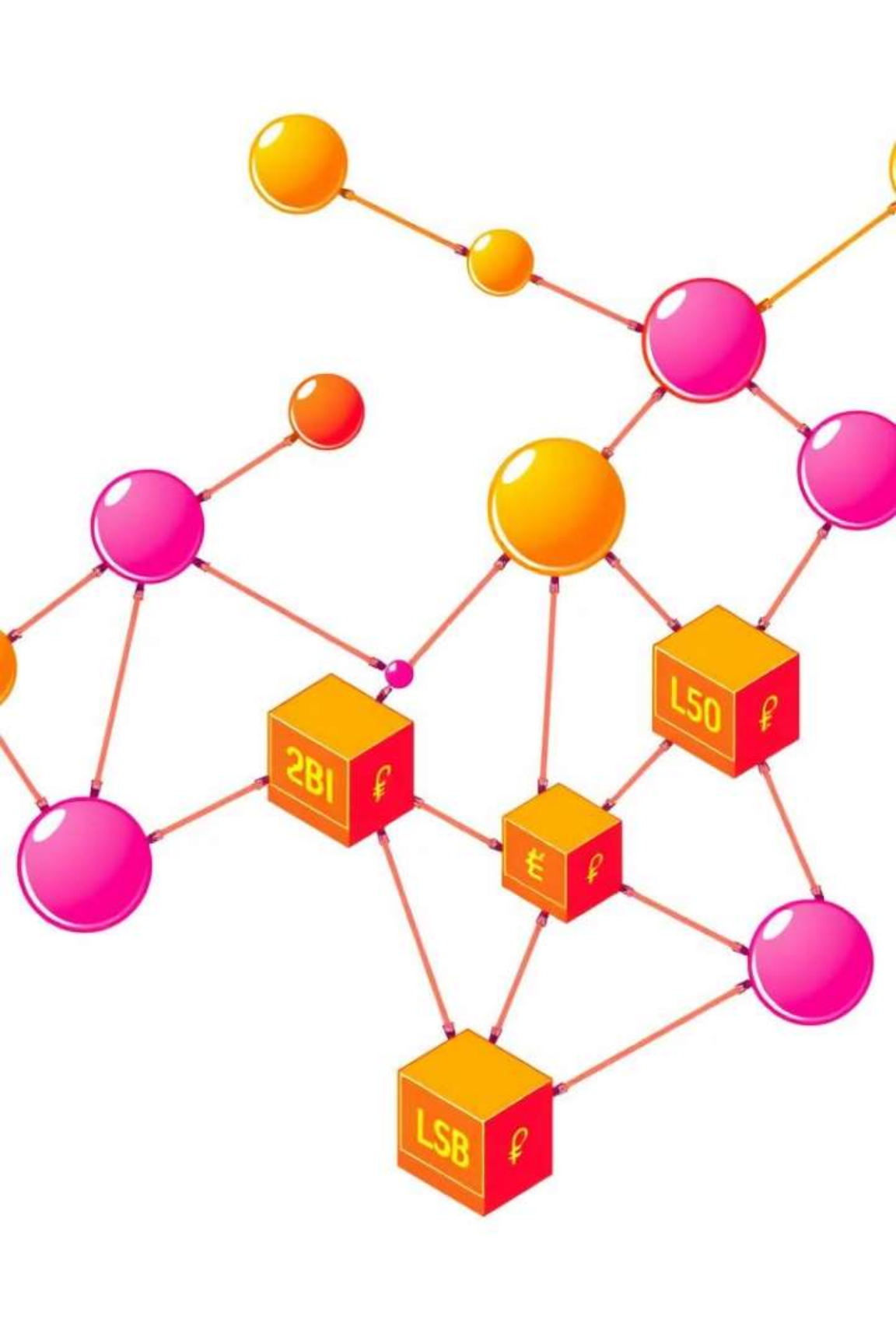
We explored different types of blockchains, including public, private, and consortium blockchains, and their distinctive features.

## Blockchain Applications

We discussed various applications of blockchain technology, ranging from cryptocurrencies to supply chain management and digital identity.

# Guess the Topic: Blockchain Network Visualization





# Blockchain Network Components: Nodes, Blocks, and Consensus

## 1 Nodes

Nodes are individual computers or devices participating in the network, validating transactions and maintaining the blockchain's integrity.

## 2 Blocks

Blocks are data containers containing records of transactions, chained together in chronological order, forming the blockchain's structure.

## 3 Consensus

Consensus mechanisms, such as Proof-of-Work or Proof-of-Stake, ensure agreement among nodes on the validity of transactions and the state of the blockchain.

# Decentralized Nature of Blockchain Networks

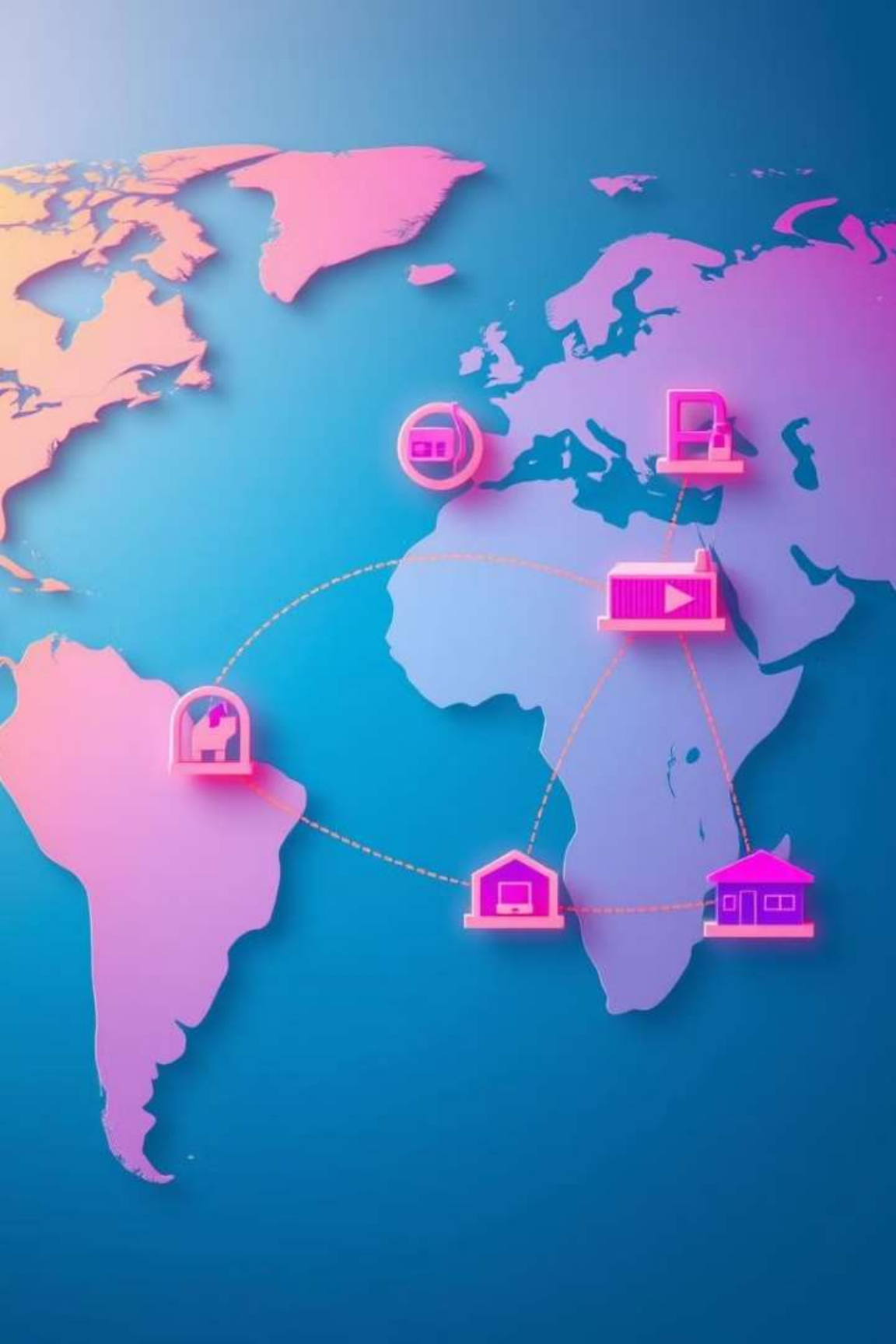
## Distributed Ledger

A blockchain is a distributed ledger, meaning every node in the network holds a copy of the blockchain, ensuring redundancy and resilience.

## No Single Point of Failure

The decentralized nature of blockchain networks eliminates reliance on a central authority, reducing risks of manipulation or downtime.





# Real-Life Case Study: Blockchain in Supply Chain Traceability



## Transparency and Traceability

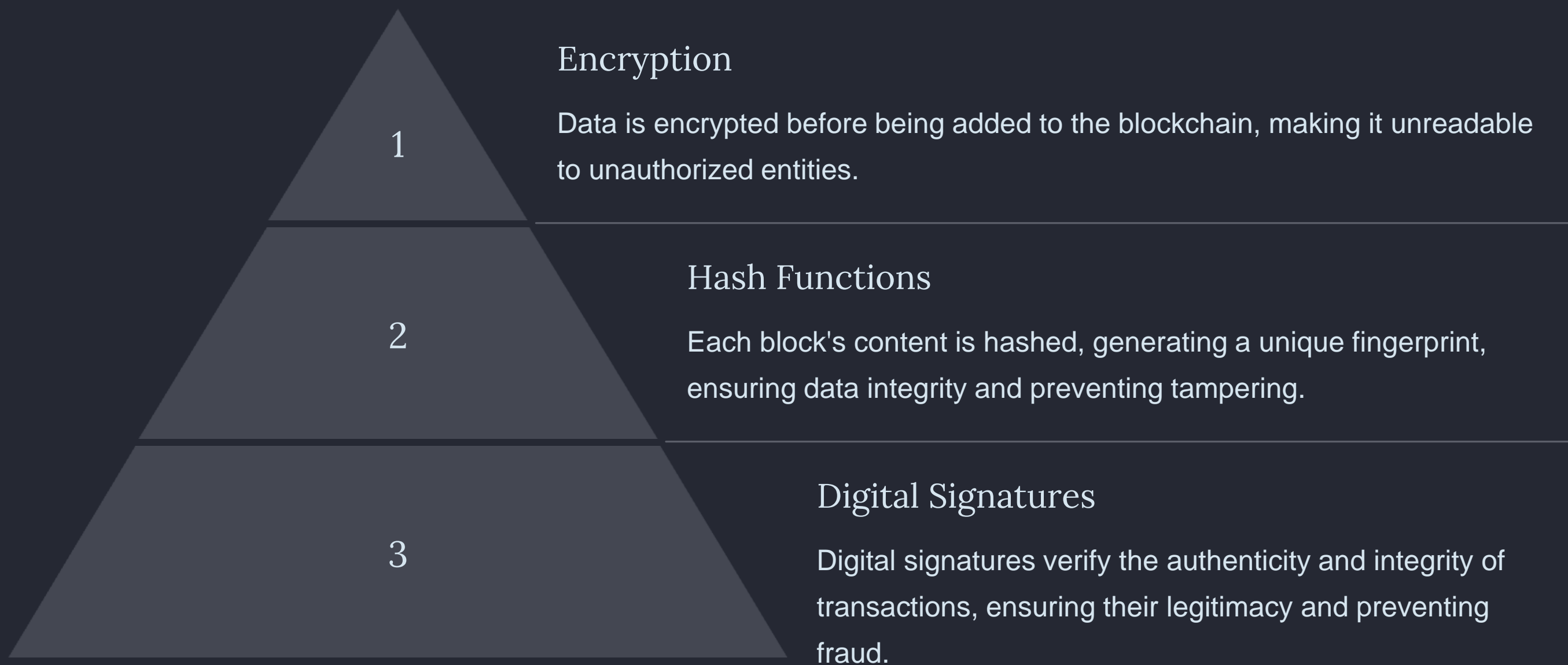
Blockchain provides transparency and traceability throughout the supply chain, ensuring authenticity and origin of products.



## Efficient Data Management

Real-time data tracking and access improve efficiency, reduce fraud risks, and enhance supply chain management.

# Secured Transactions through Cryptography



# Immutability: The Cornerstone of Blockchain

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## Once Written, Cannot Be Altered

Once a block is added to the blockchain, it cannot be modified or deleted, ensuring data immutability and integrity.

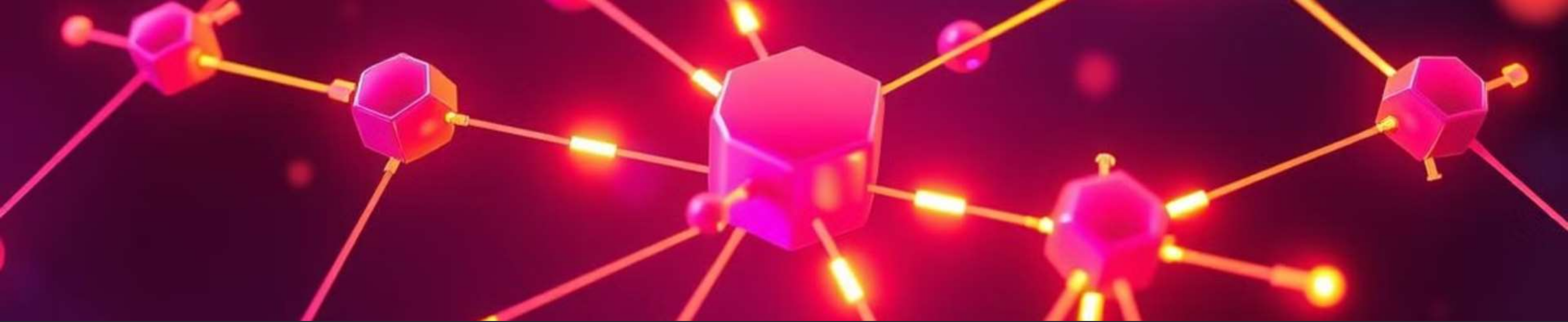
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## Trust and Transparency

Immutability enhances trust and transparency, as all actions and transactions are permanently recorded and verifiable.





# Blockchain Network Scalability and Performance

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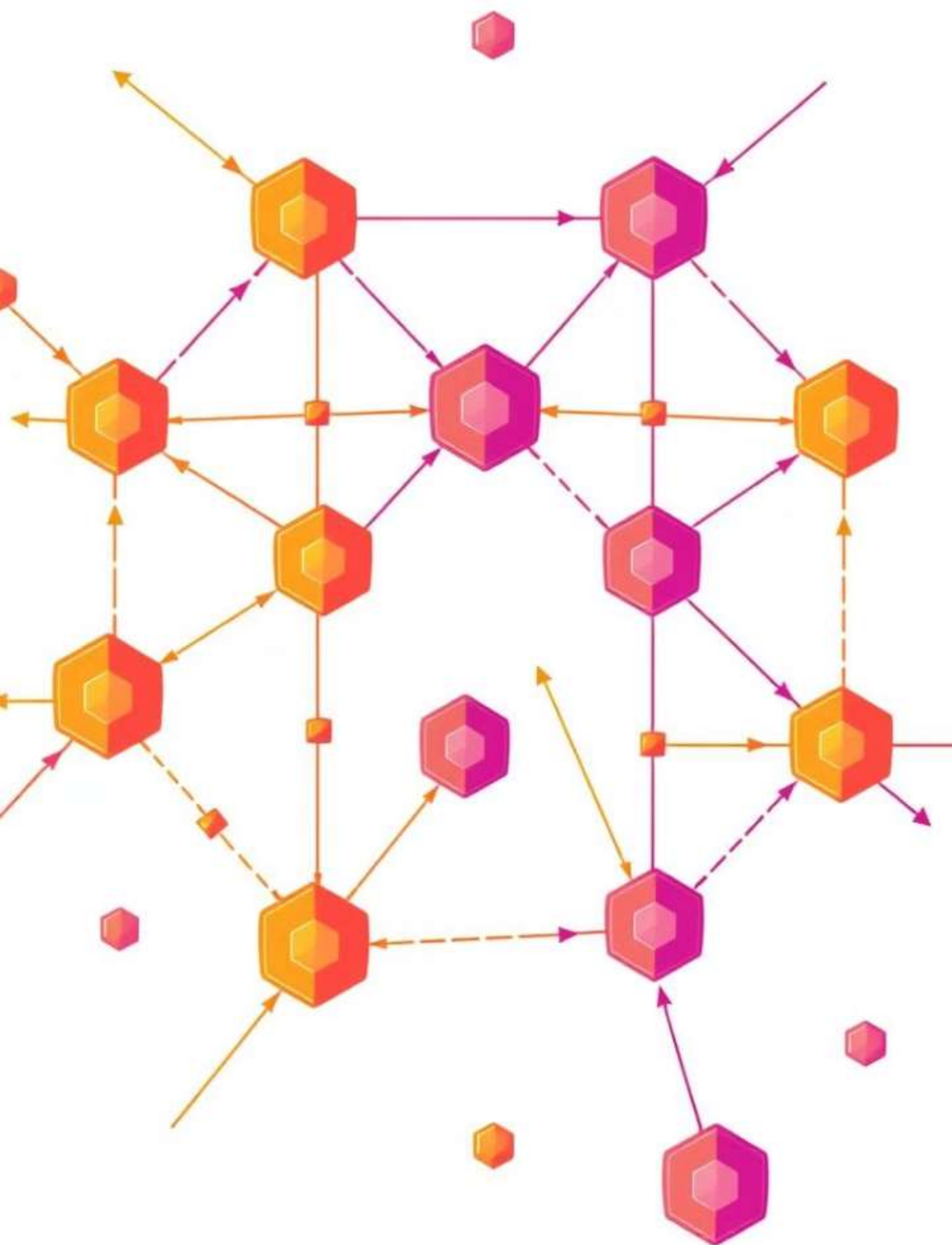
Transactions Per Second (TPS)

Blockchain networks can process transactions at different speeds, depending on the technology used and network congestion.

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Scalability Challenges

As adoption increases, blockchain networks face challenges in scaling to handle high volumes of transactions efficiently.



# Summary and References

Today, we explored the fundamental components of a blockchain network, its decentralized nature, and its real-world applications. By understanding these concepts, you can better grasp the potential of blockchain technology to revolutionize various industries.