

# Understanding Blockchain: A Deep Dive

Welcome to FINTECH AND FINANCIAL ANALYTICS, unit 4 on blockchain. This presentation explores different types of blockchains, including their characteristics and real-world applications.

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# Recap: Previous Presentation

## Introduction to Blockchain

We introduced the concept of blockchain, including its core principles, decentralized nature, and role in the emerging digital economy.

## Key Concepts

We discussed important concepts like cryptography, consensus mechanisms, and smart contracts, forming the building blocks of blockchain technology.

# Guess the Topic

■ What is a blockchain?

It's a secure, transparent, and decentralized ledger for recording transactions. It's a fundamental technology driving innovation in finance and beyond.

■ How does blockchain work?

It relies on cryptography and a distributed network to ensure data integrity, security, and transparency.

■ What are the different types?

Today we'll explore different types of blockchains, each with unique features and applications.



# Public vs Private Blockchains

## Public Blockchains

Anyone can join the network, participate in mining or validation, and access the entire transaction history.  
Examples: Bitcoin and Ethereum.

## Private Blockchains

Access is restricted to authorized participants, typically controlled by an organization or consortium. Examples: Hyperledger Fabric and Corda.

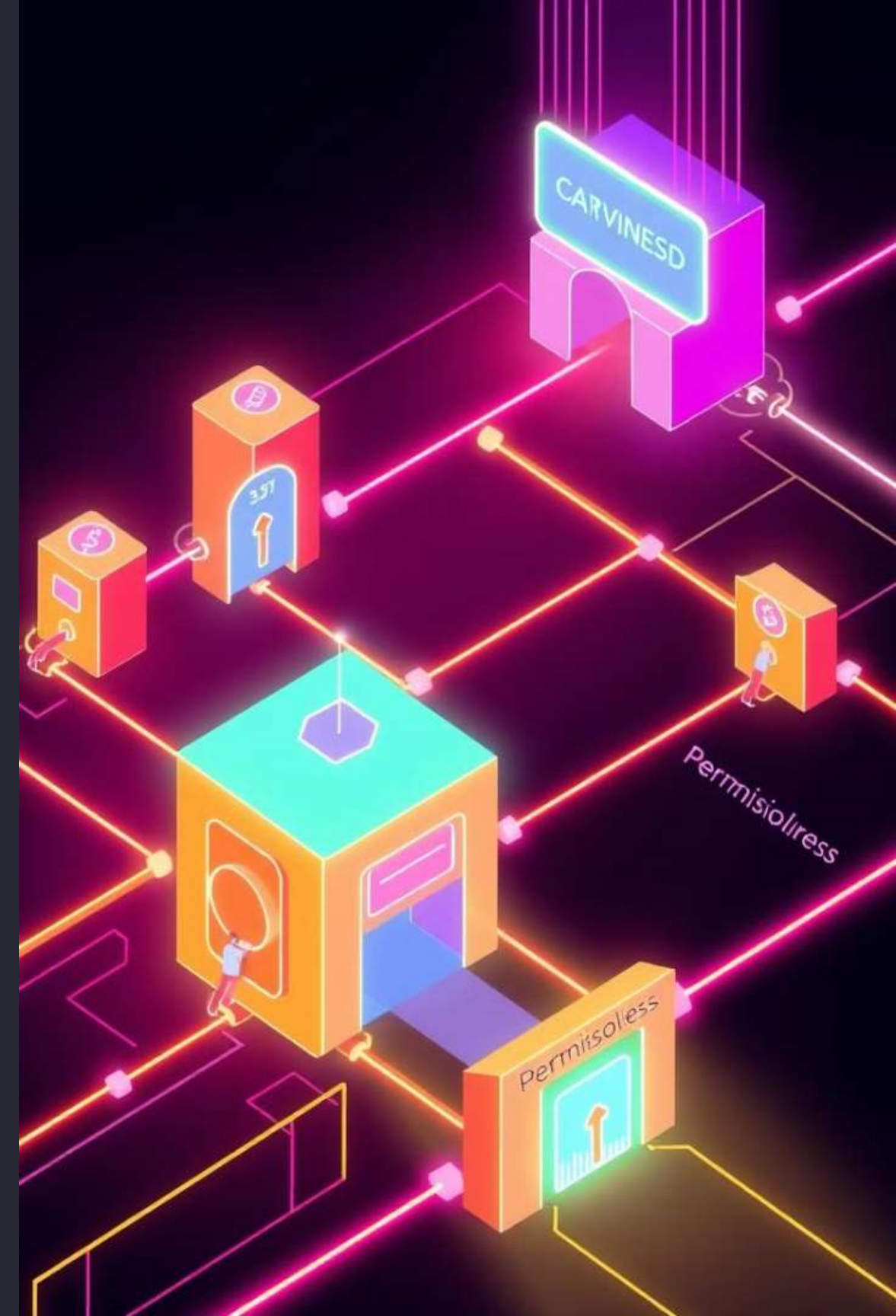
# Permissioned vs Permissionless Blockchains

## Permissionless Blockchains

Open to anyone, allowing anyone to join and participate in the network without any authorization.

## Permissioned Blockchains

Require permission to participate, controlled by a central authority or consortium, suitable for specific applications and use cases.





# Real-Life Case Studies



## Supply Chain Management

Blockchain can track goods from origin to delivery, enhancing transparency and reducing fraud.



## Digital Identity

Blockchain allows for secure and tamper-proof digital identities, simplifying user authentication and verification.



## Financial Services

Blockchain enables faster and more efficient cross-border payments, securities trading, and other financial operations.





# Scalability and Consensus Mechanisms

1

## Proof-of-Work

Requires miners to solve complex computational puzzles, securing the network but consuming significant energy.

2

## Proof-of-Stake

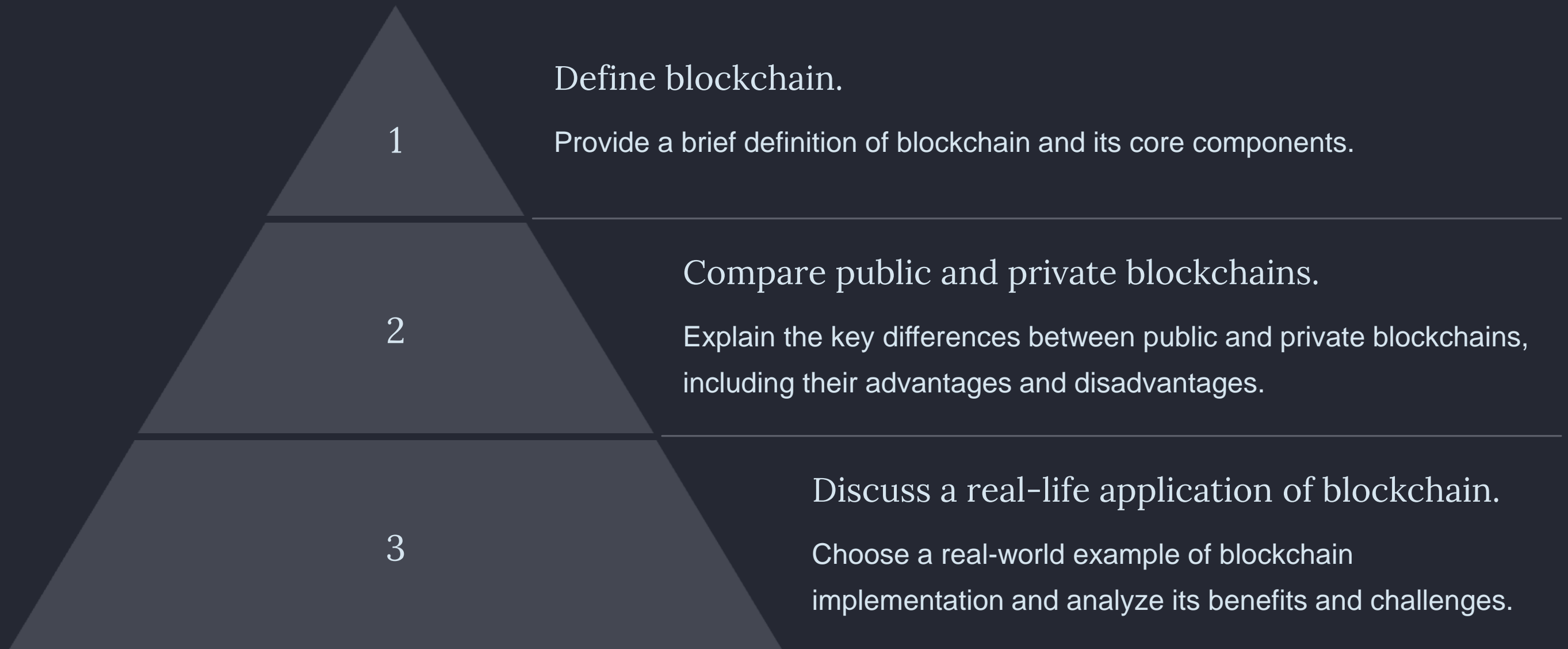
Validators are selected based on their stake in the network, offering a more energy-efficient approach.

3

## Practical Byzantine Fault Tolerance (PBFT)

Suitable for permissioned blockchains, allowing for faster transaction processing and improved scalability.

# Student Learning Assessment





# Summary and Key Takeaways

1

## Types of blockchains

We explored different types of blockchains, including public, private, permissioned, and permissionless.

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2

## Real-world applications

Blockchain has diverse applications in various sectors, from finance to supply chain management.

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3

## Scalability and consensus

We discussed the importance of scalability and different consensus mechanisms used in blockchain networks.



# References and Additional Resources

1

Online Resources

CoinDesk, Cointelegraph, Bitcoin.org, Ethereum.org

2

Books

Blockchain Revolution by Don Tapscott and Alex Tapscott,  
Mastering Bitcoin by Andreas Antonopoulos