

# Blockchain Study Notes Day 3:

## Chapter 3 - Why Web3 and Purpose of Smart Contracts

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### Introduction

Web3 represents the next evolution of the internet, emphasizing decentralization, user control, and enhanced security. Smart contracts, a critical component of Web3, enable automated, trustless transactions and interactions.

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### Subtopics

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#### 1. Why Web3?

##### What is Web3?

- Web3 refers to the third generation of the internet, powered by blockchain technology.
- It shifts control from centralized entities to individuals by decentralizing data and decision-making processes.

##### Key Features of Web3:

- **Decentralization:** Data is stored across a distributed network, eliminating the need for centralized servers.
- **Ownership:** Users own their data and digital assets (e.g., NFTs, cryptocurrencies).
- **Interoperability:** Different platforms and applications can work seamlessly.
- **Transparency and Trust:** Transactions and operations are publicly verifiable.

##### Why Web3 Matters:

- **Freedom and Control:** Users can interact and transact without intermediaries (e.g., banks, social media platforms).
- **Enhanced Security:** Blockchain ensures data integrity and reduces the risk of hacks.
- **Token-based Economy:** Incentivizes participation and rewards contributors.
- **Censorship Resistance:** Content and transactions cannot be easily suppressed by centralized authorities.

##### Real-world Applications:

- **Decentralized Finance (DeFi):** Financial services like lending, borrowing, and trading without banks.
  - **Decentralized Autonomous Organizations (DAOs):** Organizations governed by code and community voting.
  - **Decentralized Applications (dApps):** Apps built on blockchain platforms (e.g., Ethereum, Solana).
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## 2. Purpose of Smart Contracts

### What Are Smart Contracts?

- **Definition:** Self-executing contracts with terms directly written into code.
- **Platform:** Most smart contracts run on blockchain platforms like Ethereum.

### How They Work:

1. **Deployment:** A smart contract is created and deployed on a blockchain.
2. **Execution:** When predefined conditions are met, the contract automatically executes actions (e.g., transferring funds).
3. **Immutability:** Once deployed, smart contracts cannot be altered.

### Core Benefits:

- **Automation:** Eliminates the need for intermediaries by automating processes.
- **Transparency:** Contract code is publicly accessible, ensuring trust.
- **Cost Efficiency:** Reduces fees associated with middlemen.
- **Accuracy:** Ensures that contract terms are executed exactly as coded.

### Use Cases:

1. **Finance:**
  - Automating loan approvals, payments, and settlements.
2. **Supply Chain:**
  - Tracking goods from production to delivery, releasing payments upon delivery.
3. **Insurance:**
  - Automatically triggering payouts when certain conditions (e.g., flight delays) are met.
4. **Real Estate:**
  - Facilitating property transfers without the need for escrow agents.

### Limitations:

- **Code Dependency:** Errors in the code can lead to vulnerabilities or losses.
- **Irreversibility:** Once executed, smart contracts cannot be undone.

- **Scalability:** High network activity can slow down execution and increase fees.
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## Home Task

1. **Explore dApps:**
    - Identify and interact with at least one decentralized application.
  2. **Write a Simple Smart Contract:**
    - Use Solidity (Ethereum's programming language) to create a basic contract that stores and retrieves data.
  3. **Research Web3 Ecosystem:**
    - Study popular Web3 platforms like Ethereum, Solana, and Polkadot.
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## Conclusion

Web3 is revolutionizing the internet by empowering users with control, security, and transparency. At its core, smart contracts enable trustless, automated transactions, unlocking a wide range of applications across industries. Mastering these concepts is crucial for understanding and leveraging the full potential of blockchain technology.

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Day 3 Notes

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