Blockchain Honor Minor Degree : Sem VIII

HBCC801 : Decentralized Finance (DeFi)

Module - 1: Introduction to Centralized & Decentralized Finance (2 Hours)

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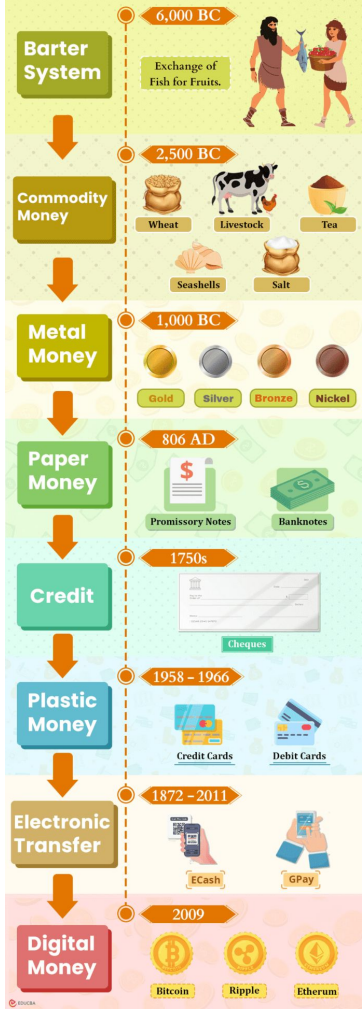
Topics to be covered

- Evolution of Finance
- Purpose of Money
- Characteristics of Money
- Introduction to Centralized and Decentralized Finance
- Difference between Centralized and Decentralized Finance
  - Architecture
  - Payment and Clearance systems
  - Transaction Flow
  - Accessibility
  - Centralization and Transparency
  - Cost & Time Comparison
- Impact & Challenges of DeFi
- Comparison on DeFi with Traditional Finance in India

Evolution of Finance

1. **Barter System (Pre-monetary Era)**
   - First peer - peer DeFi
   - Direct exchange of goods and services
   - Example: Grain exchanged for cattle
   - **Limitations:**
     - Double coincidence of wants
     - No standard value measure
     - Difficult to store wealth
2. **Commodity Money**
   - Commodities used as money (gold, silver, shells)
   - Accepted due to intrinsic value
   - **Advantages:** Durable and divisible
   - **Limitations:** Heavy, not easy to transport



Courtesy :
DeFi - The Future of Finance, Campbell et. al

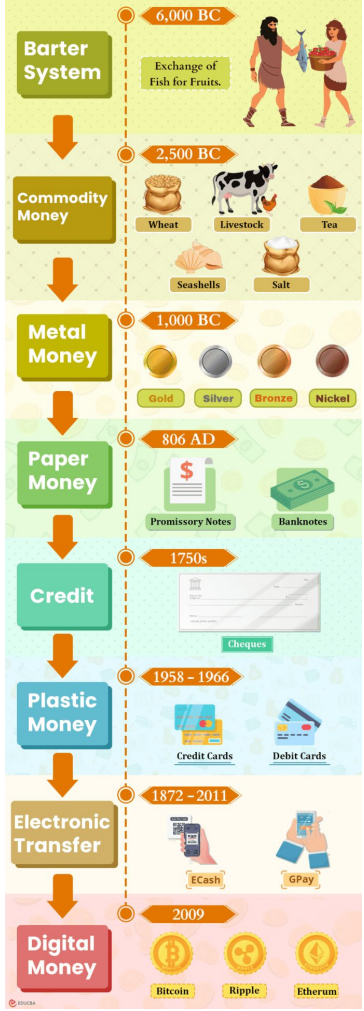
Evolution of Finance

3. Metallic Money

- Coins made of gold, silver, copper
- Issued by rulers or governments
- Standardized value and weight
- Increased trust and acceptance

4. Paper Money (Fiat Currency)

- Introduced by governments
- Value backed by trust, not commodities
- Easier storage and portability
- Regulated by central banks



Courtesy :
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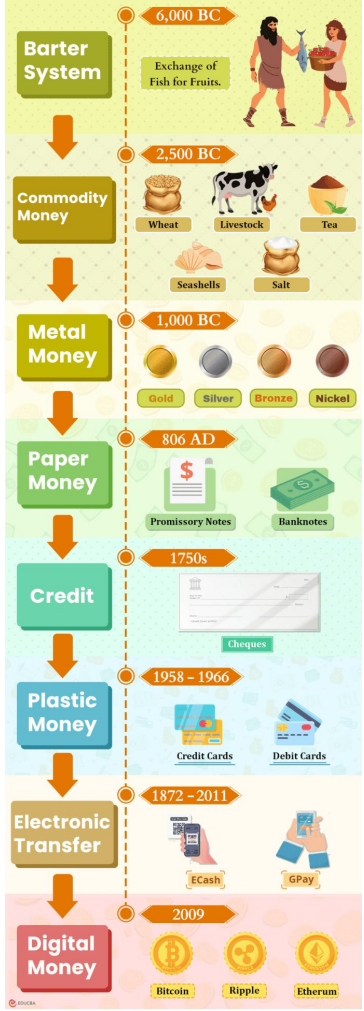
Evolution of Finance

5. Banking System & Centralized Finance

- Emergence of banks and financial institutions
- Services: deposits, loans, payments
- Centralized control and regulation
- Examples: NEFT, RTGS, SWIFT

6. Electronic & Digital Banking

- Internet banking and mobile banking
- Faster electronic payments
- Examples: Debit cards, Credit cards, UPI
- Reduced dependence on physical cash



Courtesy :
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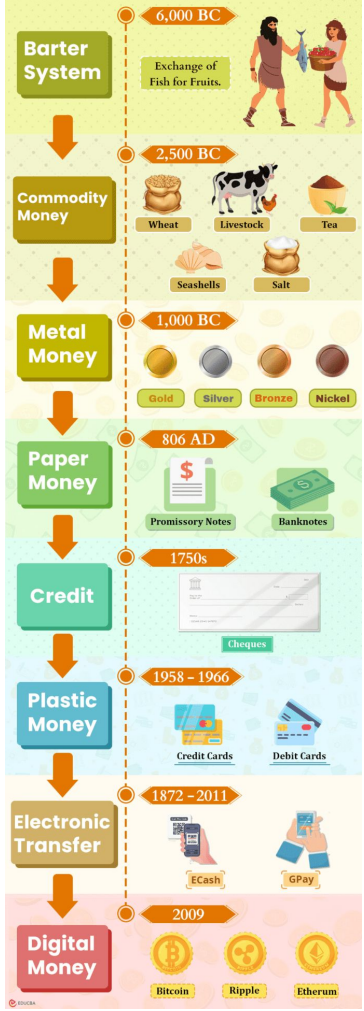
Evolution of Finance

7. FinTech Era

- Technology-driven financial services
- Innovations in payments, lending, insurance
- Examples: Paytm, PhonePe, Stripe
- Increased financial inclusion

8. Cryptocurrency

- Introduction of Bitcoin (2009)
- Peer-to-peer digital currency
- Decentralized and borderless
- Eliminates intermediaries



Courtesy :
DeFi - The Future of Finance, Campbell et. al

Evolution of Finance

9. Decentralized Finance (DeFi)

- Financial services on blockchain
- Uses smart contracts and DApps
- Examples: Ethereum, Uniswap, MakerDAO
- Transparent, permissionless, global

Courtesy :

- DeFi - The Future of Finance, Campbell et. al
- Alamy

Purpose of Money

Primary

- Unit of Account: A way to compare the value of various goods and services
- Medium of Exchange: Allows for non-barter transactions.

Secondary

- Store of Value: Allows value to be retained – even if partially – rather than complete decay (e.g., storing food).
- Transfer of Value: Ease of transfer of value and to defer value.

Courtesy :
DeFi - The Future of Finance, Campbell et. al

Characteristics of Money

- Durability: Withstand repeated use (coins, paper, gold)
- Portability: You can carry around
- Divisibility: Fractional units
- Uniformity: Versions of the same currency have identical value
- Limited Supply: Unlimited supply would mean zero value
- Acceptability: “This is legal tender for all debts, public and private”
- Stability: If unstable, people will look for alternatives

Courtesy :
DeFi - The Future of Finance, Campbell et. al

Introduction to Centralized and Decentralized Finance

- **Traditional finance / Centralized Finance**
  - Relies on centralized institutions (banks)
  - Centralized control
  - Facilitate payments, deposits, loans
  - stability and regulation
  - Eg: ICBC, JP Morgan, Bank of America
  - SWIFT: Global bank messaging network

    Central banks and commercial banks

    Custodial and permissioned systems

Courtesy :
DeFi - The Future of Finance, Campbell et. al

Introduction to Centralized and Decentralized Finance

- **DeFi (Decentralized Finance)**
  - uses Blockchain and smart contracts
  - Removes intermediaries and increases transparency
  - openness and innovation
  - Eg : Ethereum: Blockchain platform for DeFi

    Uniswap: Decentralized Exchange (DEX)

    MakerDAO: Decentralized lending & stablecoin

Courtesy :
DeFi - The Future of Finance, Campbell et. al

CeFi Vs DeFi w.r.t Architecture

Traditional Financial Institution (Banks) / CeFi

- Central authority
- Custodial funds
- Limited transparency

Decentralized Finance (DeFi)

- Decentralized network
- Non-custodial
- Fully transparent

[Bank → Clearing House → Bank]

Courtesy :

- DeFi - The Future of Finance, Campbell et.al
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CeFi Vs DeFi w.r.t Payment & Clearance

Traditional Financial Institution (Banks) / CeFi

- Uses SWIFT messaging network
- Multiple intermediaries
- High fees and slow settlement (2–5 days)

Decentralized Finance (DeFi)

- Peer-to-peer transfers
- Smart contract execution
- Settlement in seconds to minutes

Note : ***SWIFT (Society for Worldwide Interbank Financial Telecommunication)***

- Global messaging network
- enables banks to securely exchange financial transaction instructions.

Courtesy :
DeFi - The Future of Finance, Campbell et. al

CeFi Vs DeFi w.r.t Transaction Flow

Traditional Financial Institution (Banks) / CeFi	Decentralized Finance (DeFi)
1. User requests transfer	1. User signs transaction
2. Bank approval	2. Broadcast to blockchain
3. Intermediary banks	3. Smart contract execution
4. Settlement delay	4. Instant settlement

Courtesy :
DeFi - The Future of Finance, Campbell et. al

CeFi Vs DeFi w.r.t Accessibility, Centralization & Transparency

Traditional Financial Institution (Banks) / CeFi

Accessibility:

- Requires KYC, documents
- Excludes unbanked

Centralization & Transparency:

- Central points of failure
- Opaque operations

Decentralized Finance (DeFi)

Accessibility:

- Internet + wallet
- Open to everyone

Centralization & Transparency:

- Open-source smart contracts
- Public blockchain auditability

Courtesy :
DeFi - The Future of Finance, Campbell et. al

CeFi Vs DeFi w.r.t Cost & Time Comparison

Traditional Financial Institution (Banks) / CeFi

- Sending $1,000 from USA to Australia
  - Exchange rate markup: ~$30
  - Outbound wire fee: ~$25
  - Inbound wire fee: ~$15
  - **Total fees: ~$70**
- Settlement time: 2–5 business days

Decentralized Finance (DeFi)

- Sending $1,000 worth of crypto globally
  - Network (gas) fee: ~$0.50 – $5
  - No intermediary fees
  - **Total fees: <$5**
- Settlement time: 15 seconds – 5 minutes

Courtesy :
DeFi - The Future of Finance, Campbell et. al

Impact & Challenges of DeFi

Impact of DeFi

- Financial inclusion
- Faster and cheaper transactions
- Innovation in lending, trading, insurance

Challenges of DeFi

- Smart contract risks
- Regulatory uncertainty
- Scalability and usability

Note : Hybrid financial systems may dominate the future

Courtesy :
DeFi - The Future of Finance, Campbell et. al

Comparison on DeFi with Traditional Finance in India

Parameter	RTGS / NEFT	UPI	Crypto / DeFi
System Type	Traditional banking	Digital banking	Blockchain-based
Control	RBI & Banks	NPCI & Banks	Decentralized network
Settlement Mode	RTGS: Real-time NEFT: Batch-based	Real-time	Near real-time
Availability	Bank working hours (RTGS) 24×7 (NEFT)	24×7	24×7 / 365
Transaction Speed	Minutes to hours	Seconds	Seconds to minutes
Fees	NEFT: ₹2.5–₹25 RTGS: ₹25–₹55	Mostly free	Low network (gas) fee

Courtesy :
DeFi - The Future of Finance, Campbell et. al

Comparison on DeFi with Traditional Finance in India

Parameter	RTGS / NEFT	UPI	Crypto / DeFi
Intermediaries	Banks, RBI	Banks, NPCI	No intermediaries
Geographic Reach	India only	India only	Global
Transparency	Limited	Limited	High (public blockchain)
Security Model	Trust-based	Trust-based	Cryptography & smart contracts
Example	Bank transfer	Google Pay, PhonePe	Ethereum, Polygon, Uniswap

Courtesy :
DeFi - The Future of Finance, Campbell et. al