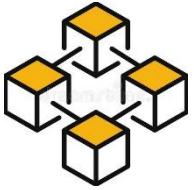




UNIT 7.1

BLOCKCHAIN APPLICATIONS CRYPTO CURRENCY

Lecturer: Ph.D Lê Quang Huy



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1. INTRODUCTION

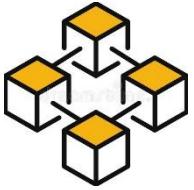
2. MONEY

3. CRYPTOCURRENCY

4. SUMMARY

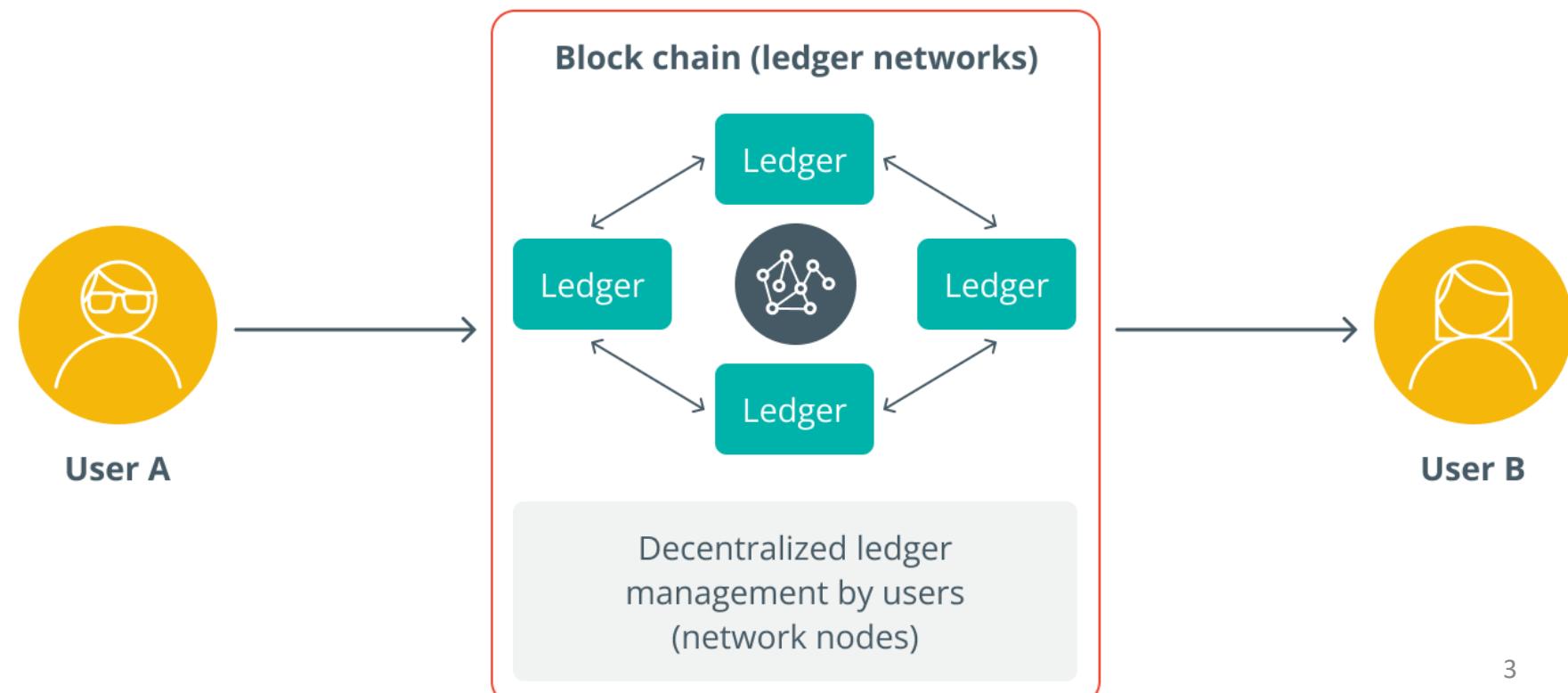
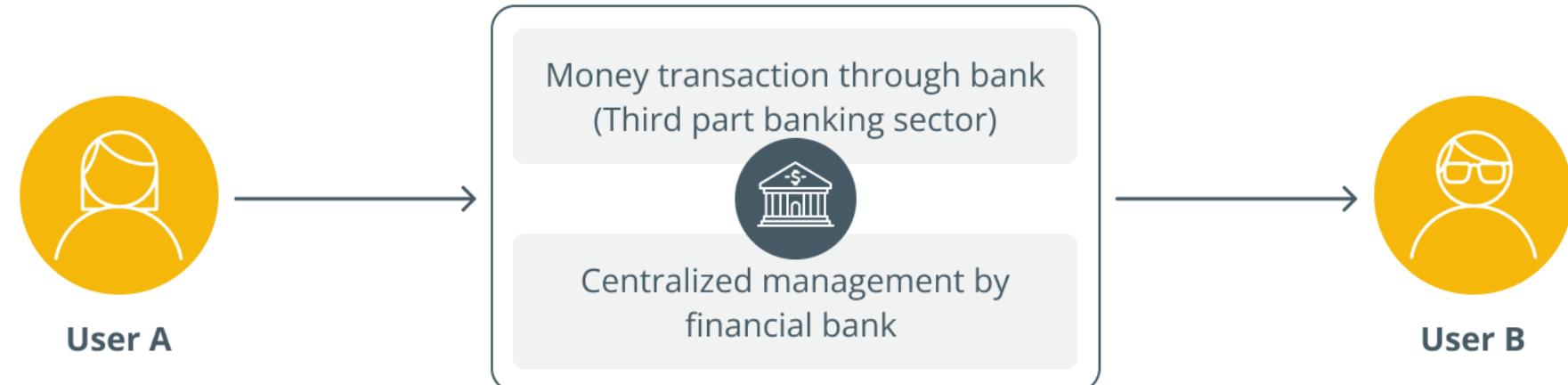
5. DISCUSSION

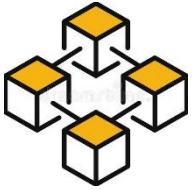




1. INTRODUCTION

- Remove intermediate institutions: directly between two parties.
- Not controlled by any central authority.
- Internet-based medium of exchange.

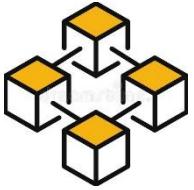




2. MONEY

- 2.1. MONEY DEFINITION
- 2.2. EVOLUTION OF MONEY
- 2.3. FUNCTIONS OF MONEY
- 2.4. CHARACTERISTICS OF MONEY
- 2.5. TYPES OF MONEY
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- 2.8. MONEY SUPPLY
- 2.9. MONEY TRANSFER
- 2.10. CURRENCY EXCHANGE
- 2.11. MONETARY POLICY



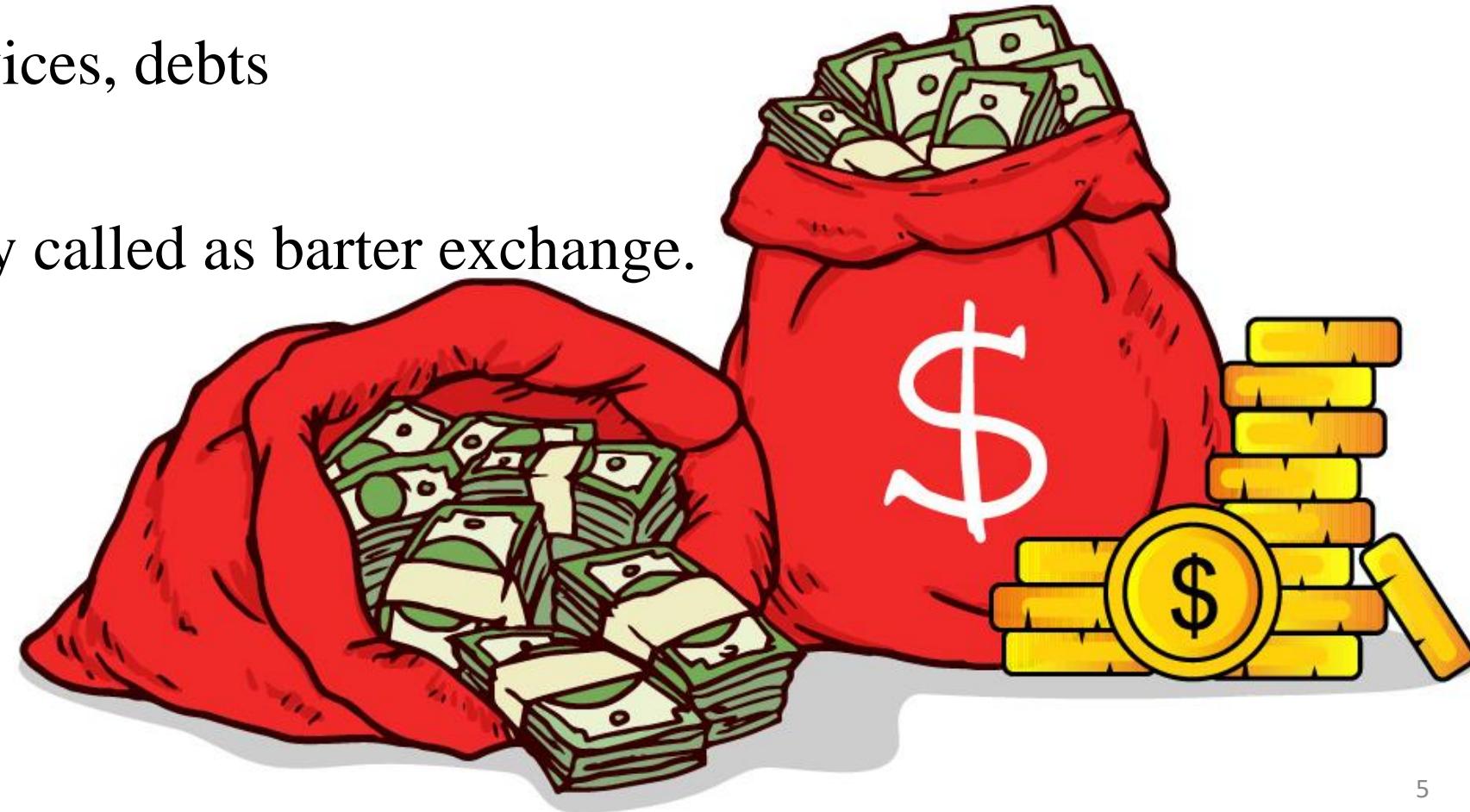


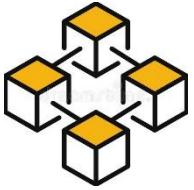
2.1. MONEY DEFINITION

Money refers to:

- Economic measure
- Exchange medium
- Payment for goods, services, debts
- Settle transactions

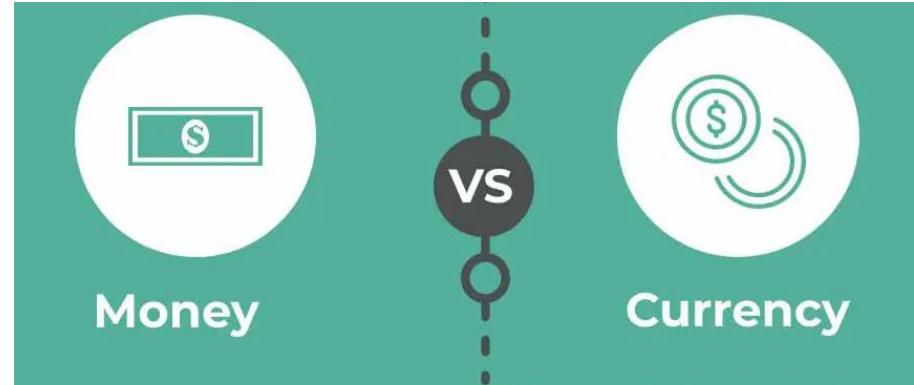
Exchanges without money called as barter exchange.





2.1. MONEY DEFINITION

- Money
- Currency
- Cash
- Coin



One cannot touch or smell money. However, money can be seen in numbers.



Currency is the promissory note or coin presented in the form of money.

Money takes the form of numbers.



Currency takes the form of hard plastic or coins or says the currency notes.

#3. Basis Form

Money



Currency

#4. Support

Money



Currency

Many different things back the money. For example, if one possesses money in a bank account, a cheque (kind of money) would be supported.

Fiat money is the currency backed by that country's government.

#5. Examples

Money



Currency



Online mode, check savings bank account, etc.

Coins, Hard currency notes, etc.

#6. Transfer Mode

Money



Currency

One can transfer money through an online method.

One must transfer currency via physical, i.e., hand-to-hand transfer.

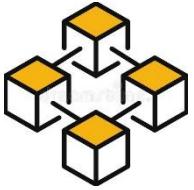
#2. Concept Type



Money is an intangible concept.

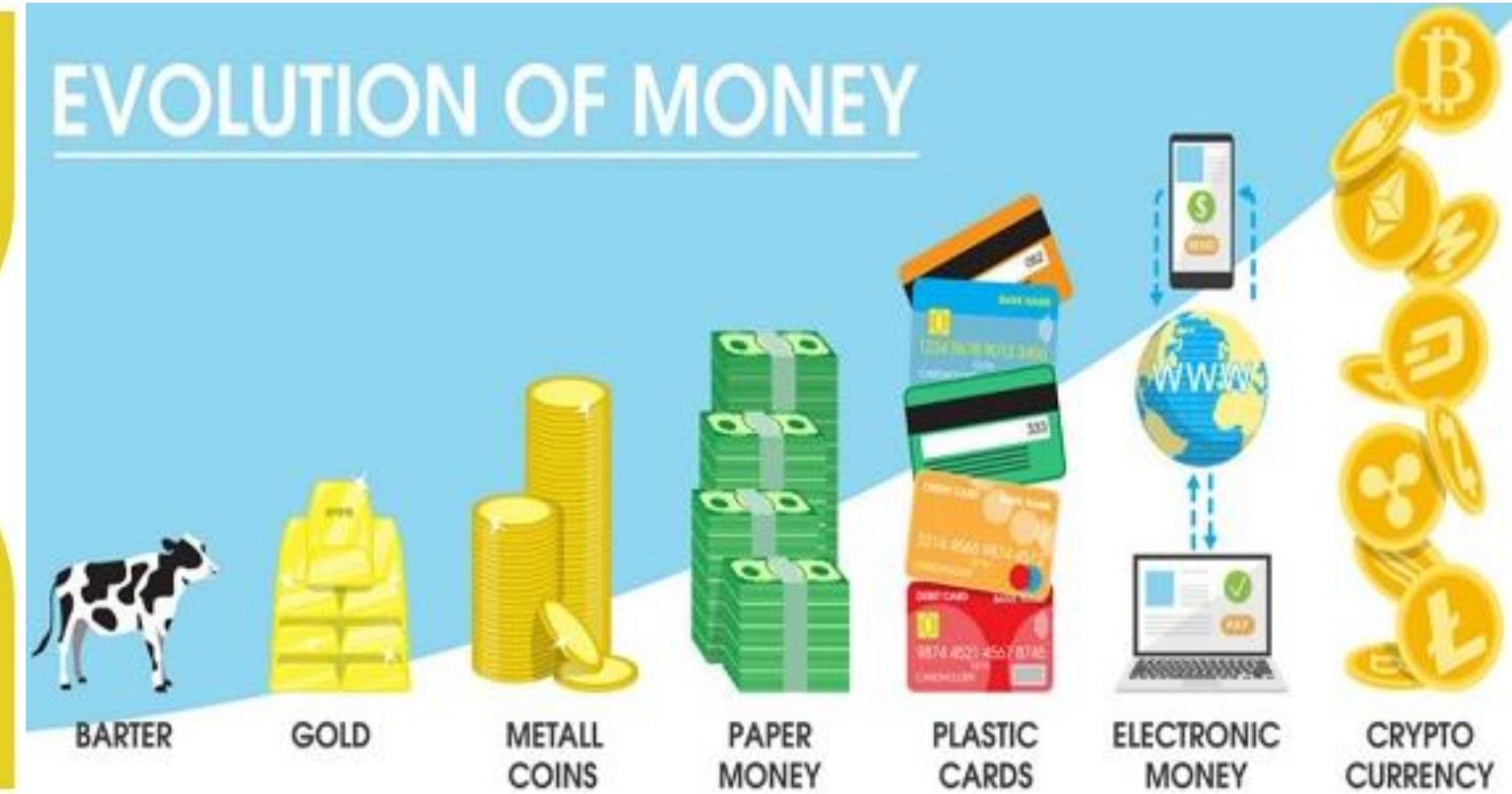
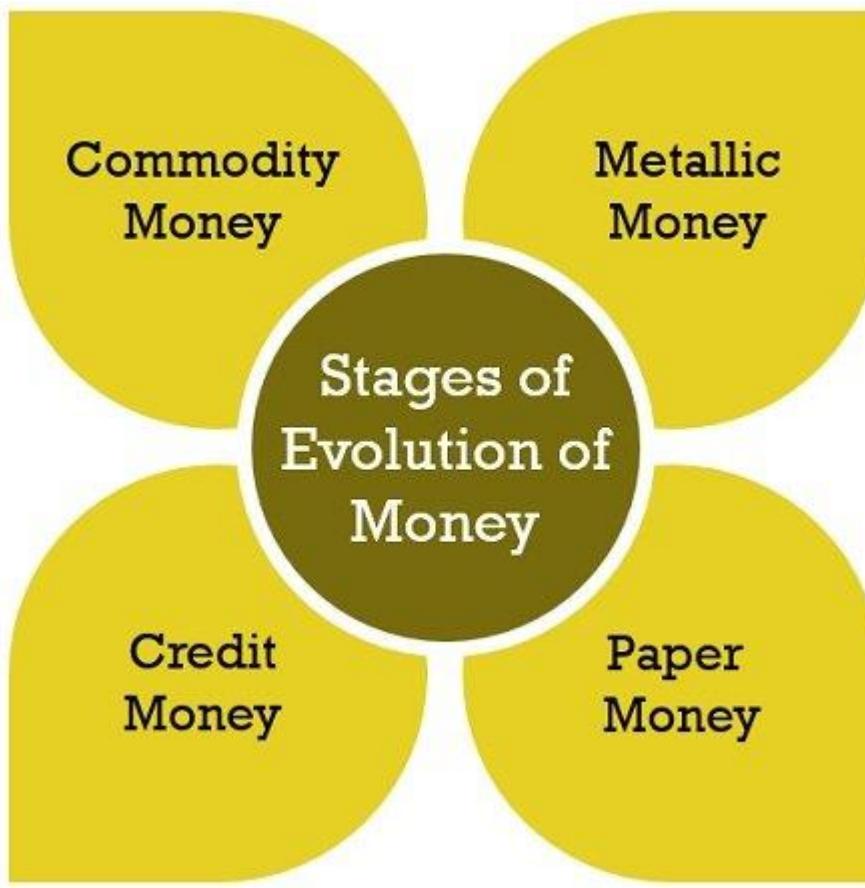


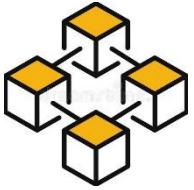
Currency is a tangible concept.



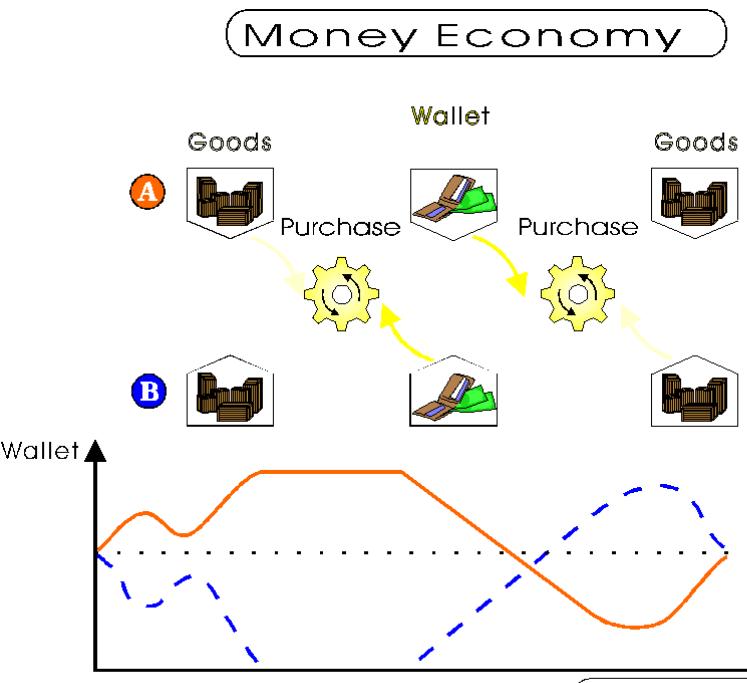
2.2. EVOLUTION OF MONEY

Money history





2.3. FUNCTIONS OF MONEY



FUNCTIONS OF MONEY



Primary

A MEDIUM OF EXCHANGE



A MEASURE OF VALUE



Secondary

A STORE OF VALUE



TRANSFER OF VALUE



STANDARD OF DEFERRED PAYMENTS



Contingent

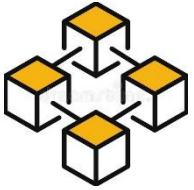
BASIS OF CREDIT CREATION



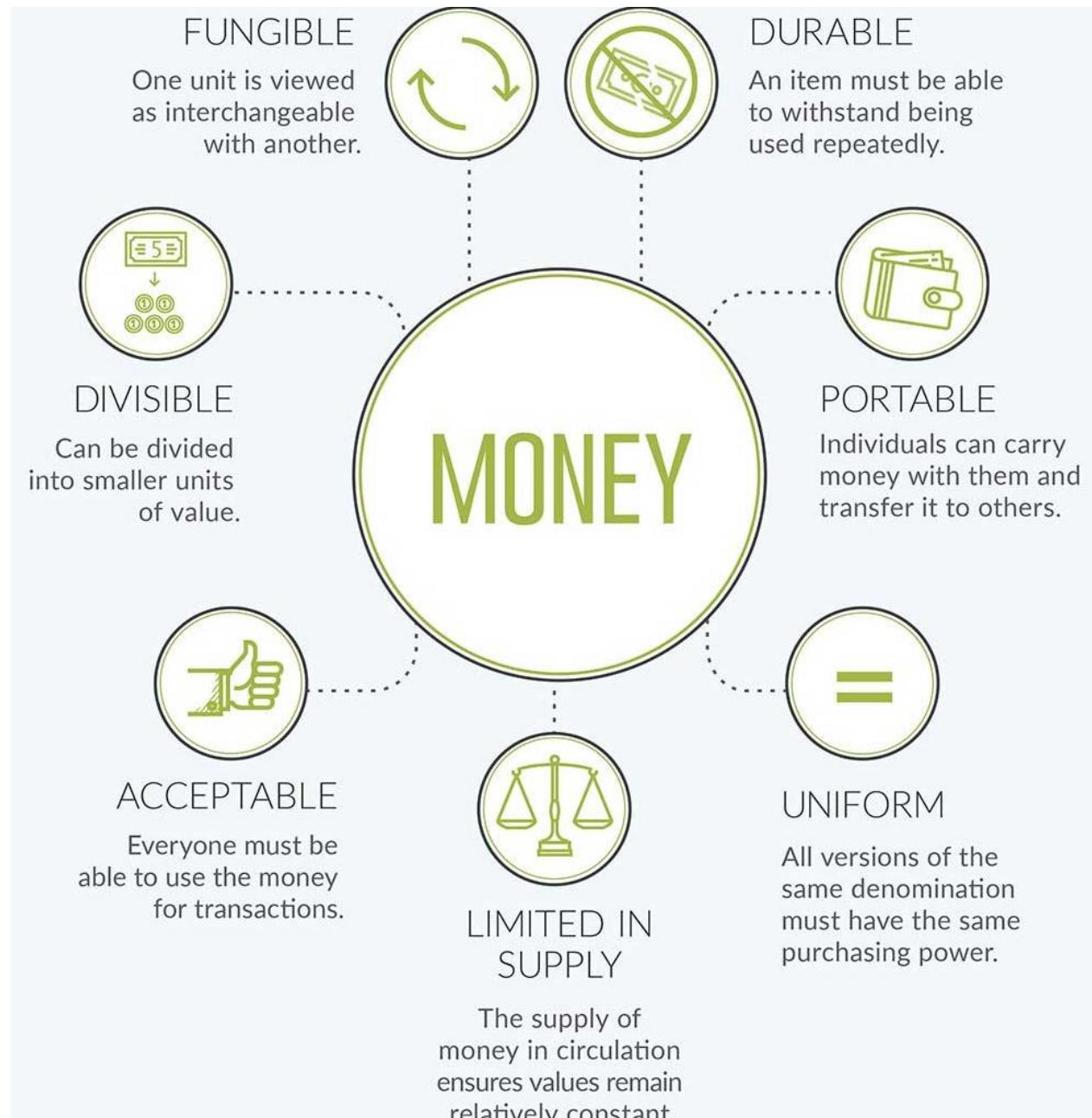
EMPLOYING FACTOR INPUTS

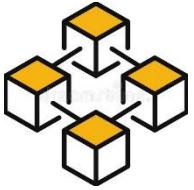
CREATION & REDISTRIBUTION OF NATIONAL INCOME

LIQUIDITY



2.4. CHARACTERISTICS OF MONEY

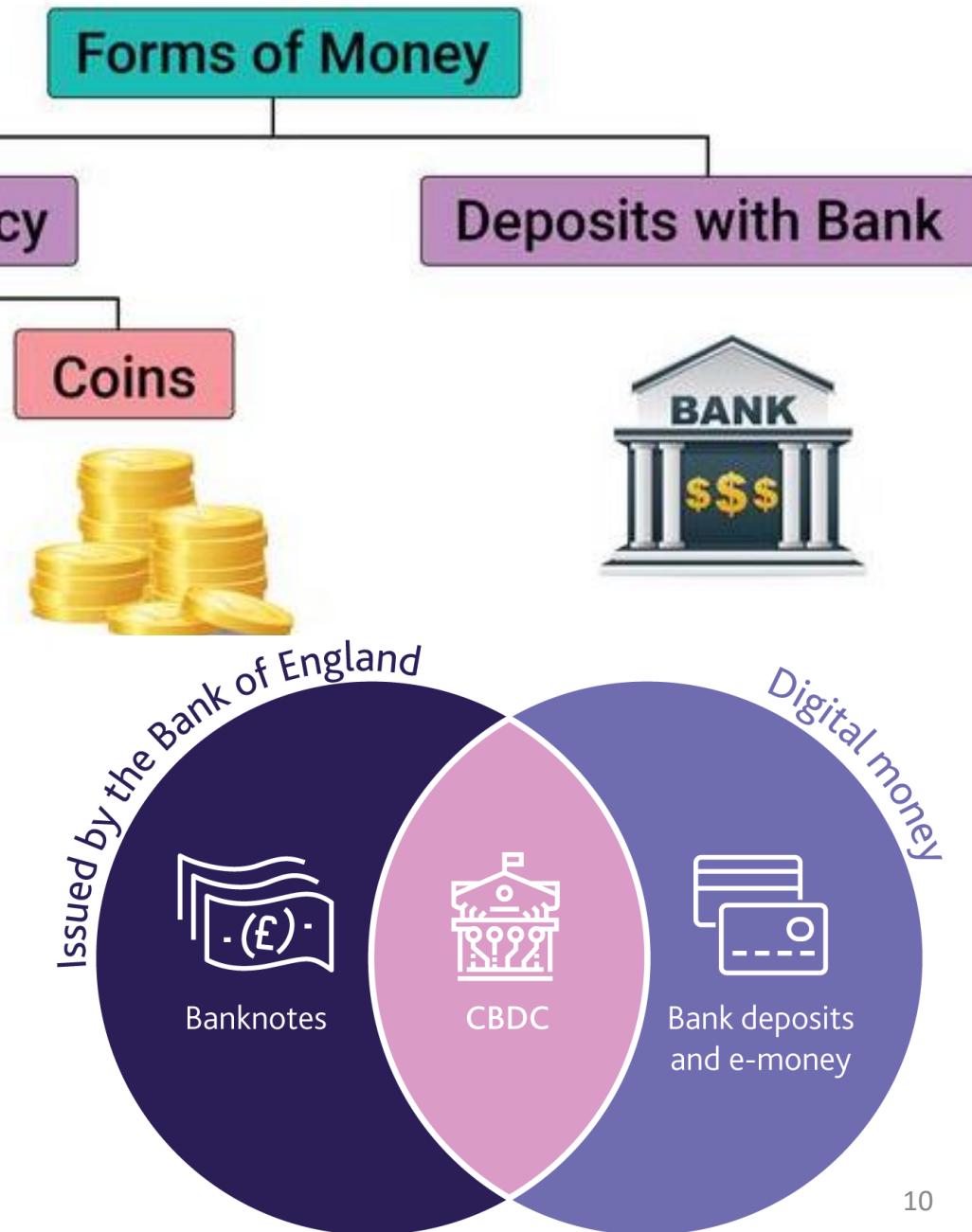
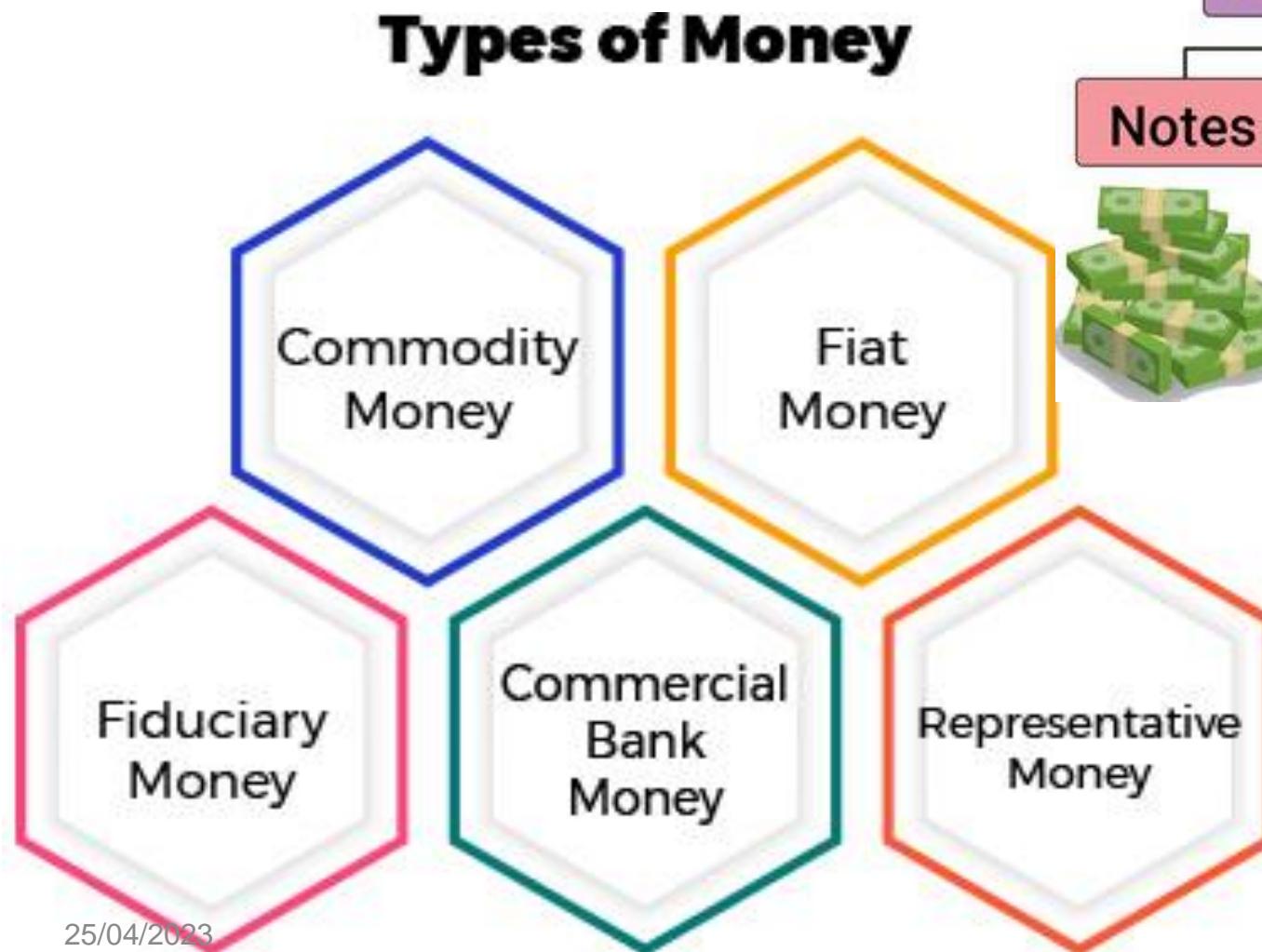


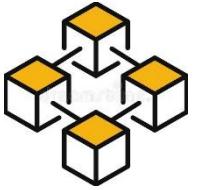


2.5. TYPES OF MONEY

Money taxonomy

Modern Forms of Money





2.5. TYPES OF MONEY

Money taxonomy

Physical

Virtual

Commodity money

Material carries
intrinsic value

e.g. gold

Fiat money

No intrinsic value
Value is conferred by
government

e.g. U.S. dollar

Digital fiat money

Digital representation
of fiat currency

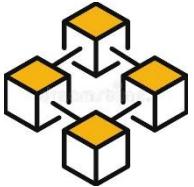
Value is conferred by
government

Virtual currency

Digital representation
of value

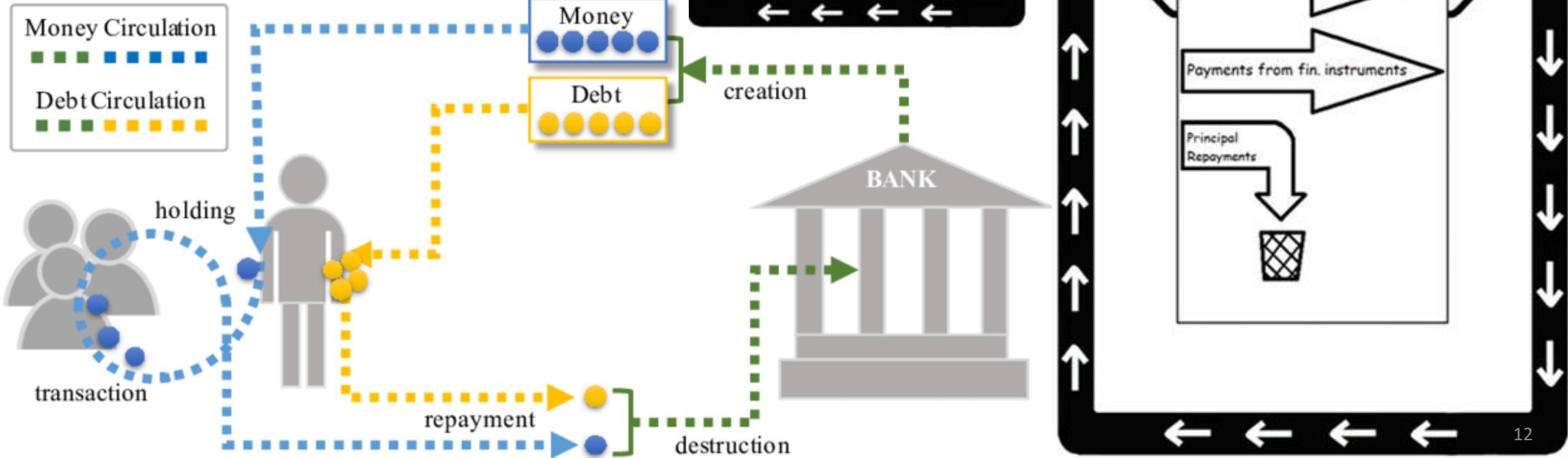
Value is derived from
its native blockchain

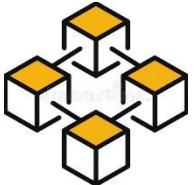
e.g. cryptocurrency



2.6. BASIC MONEY ACTIVITIES

- Create (issue)
- Supply (increase, decrease)
- Transfer (pay, settle, lend,...)
- Destruct (burning)
- Exchange

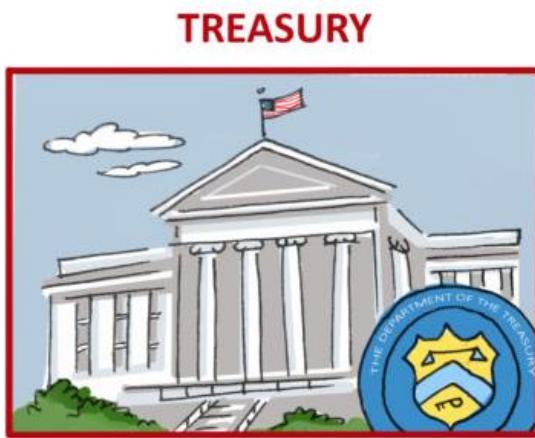




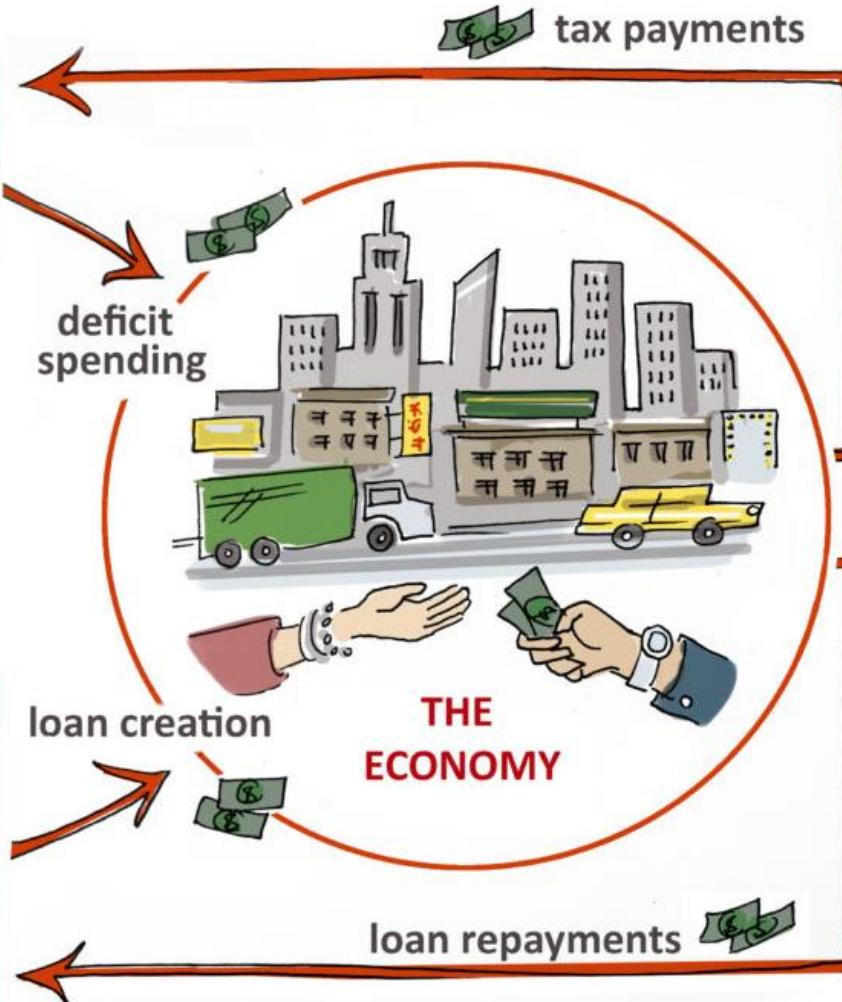
2.7. MONEY CREATION

- Create (issue)

THE PROCESS OF MONEY CREATION



BANKING SYSTEM



25/04/2023

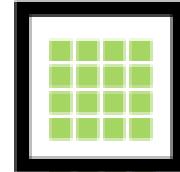
Money creation

through fractional reserve banking (expansionary monetary policy)

CENTRAL BANK

extends a loan to a commercial bank. New commercial bank money is created. Central bank can also create money by purchasing financial assets.

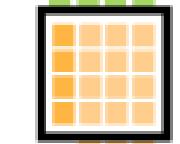
} 1



COMMERCIAL BANK

keeps the required fraction of loan sum as deposit, and extends a loan to other commercial banks.

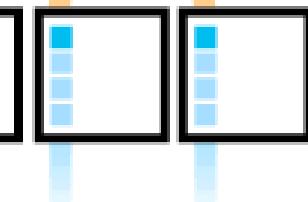
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OTHER BANKS

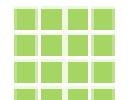
also keep the required fraction as deposit, and are free to re-lend the rest. **Because the loan counts as money, the total monetary supply increases.**

} 3



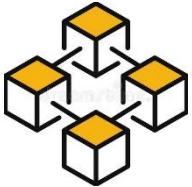
As a loan is paid back, more commercial bank money disappears from existence. Since loans are continually being issued in a normally functioning economy, the amount of broad money in the economy remains relatively stable.

Central bank
money



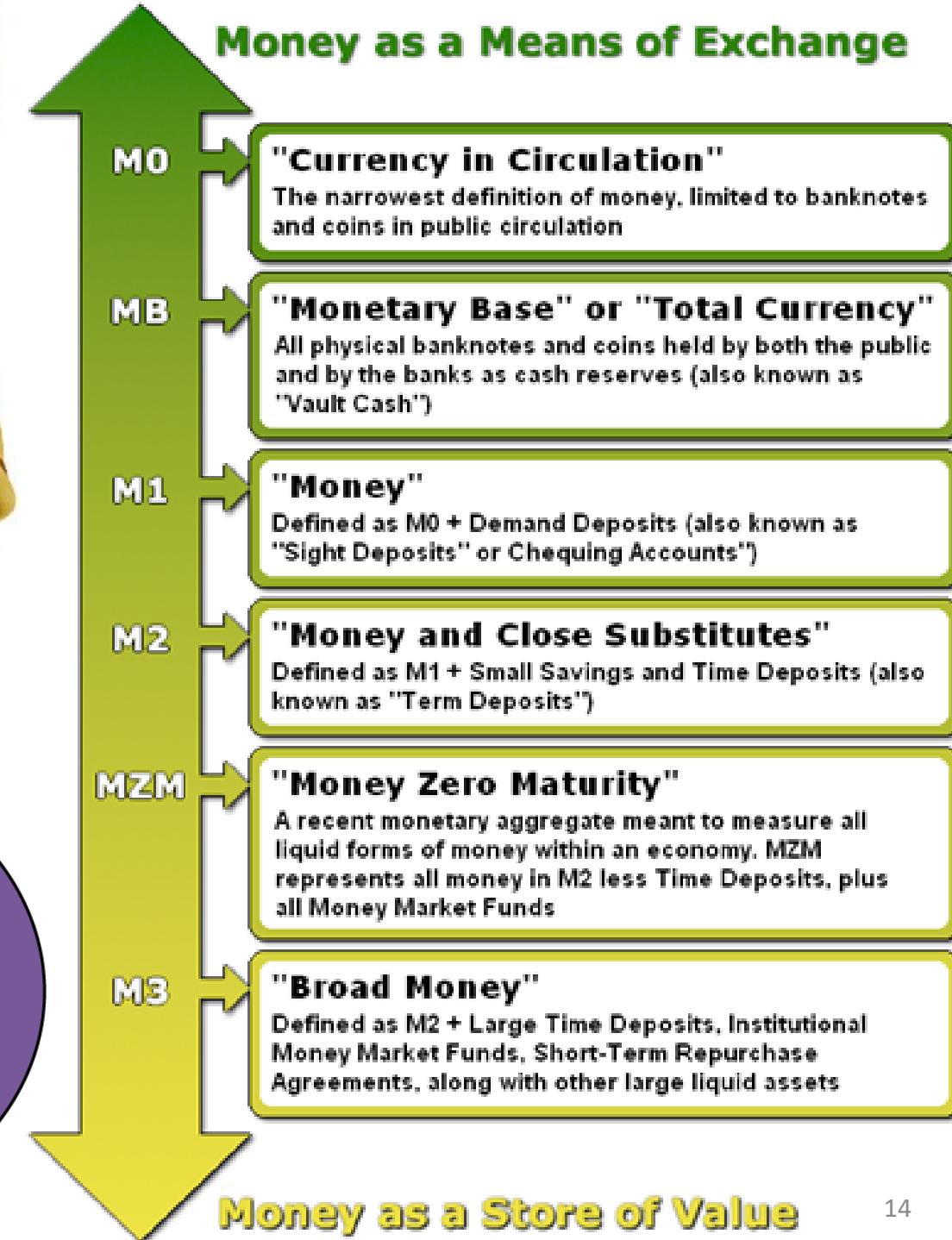
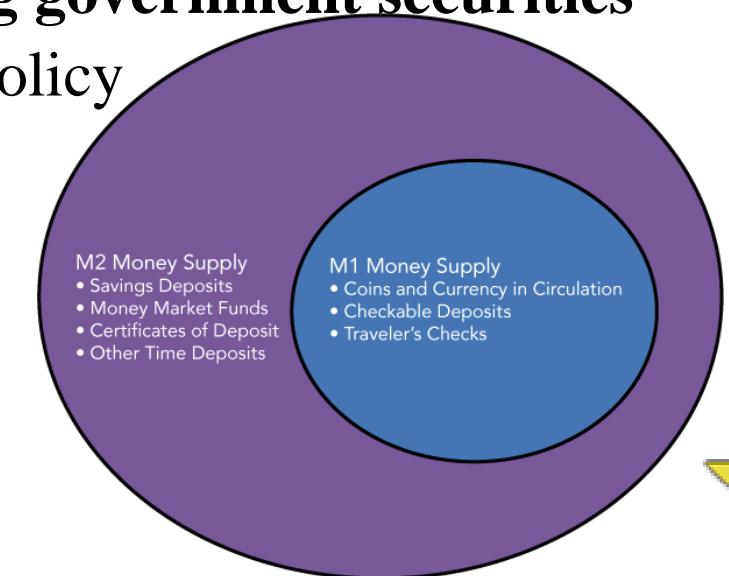
Broad money
(cash + deposits)

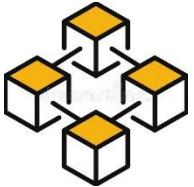




2.8. MONEY SUPPLY

- Measure:
- Increase & Decrease:
 - Print more money
 - **Reducing interest rates**
 - Quantitative easing
 - **Reduce the reserve ratio for lending**
 - Increase confidence in the banking system
 - **Central Bank buying government securities**
 - Expansionary fiscal policy

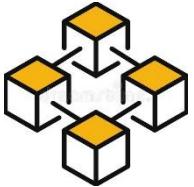




2.8. MONEY SUPPLY

Total supply vs. maximum supply vs. circulating supply

	Total supply	Maximum supply	Circulating supply
Change in supply	Sum of all coins, including the undistributed yet.	All coins that will ever come into existence.	Number of tokens currently in existence and available for trading.
Burned and locked-up coins	Doesn't include burned or inaccessible coins.	Coins that have yet to be mined.	Doesn't include locked-up or reserved tokens.
Change in supply	Supply can change over time.	Harder to change supply over time.	Supply can change over time.



2.9. MONEY TRANSFER

Money transfer:

- Moving money from one to another
- Direct or through financial system



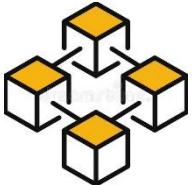
Types of wire transfers:

- In-person bank transfers
- Telephone
- Online payment systems
- Online banking

Concern:

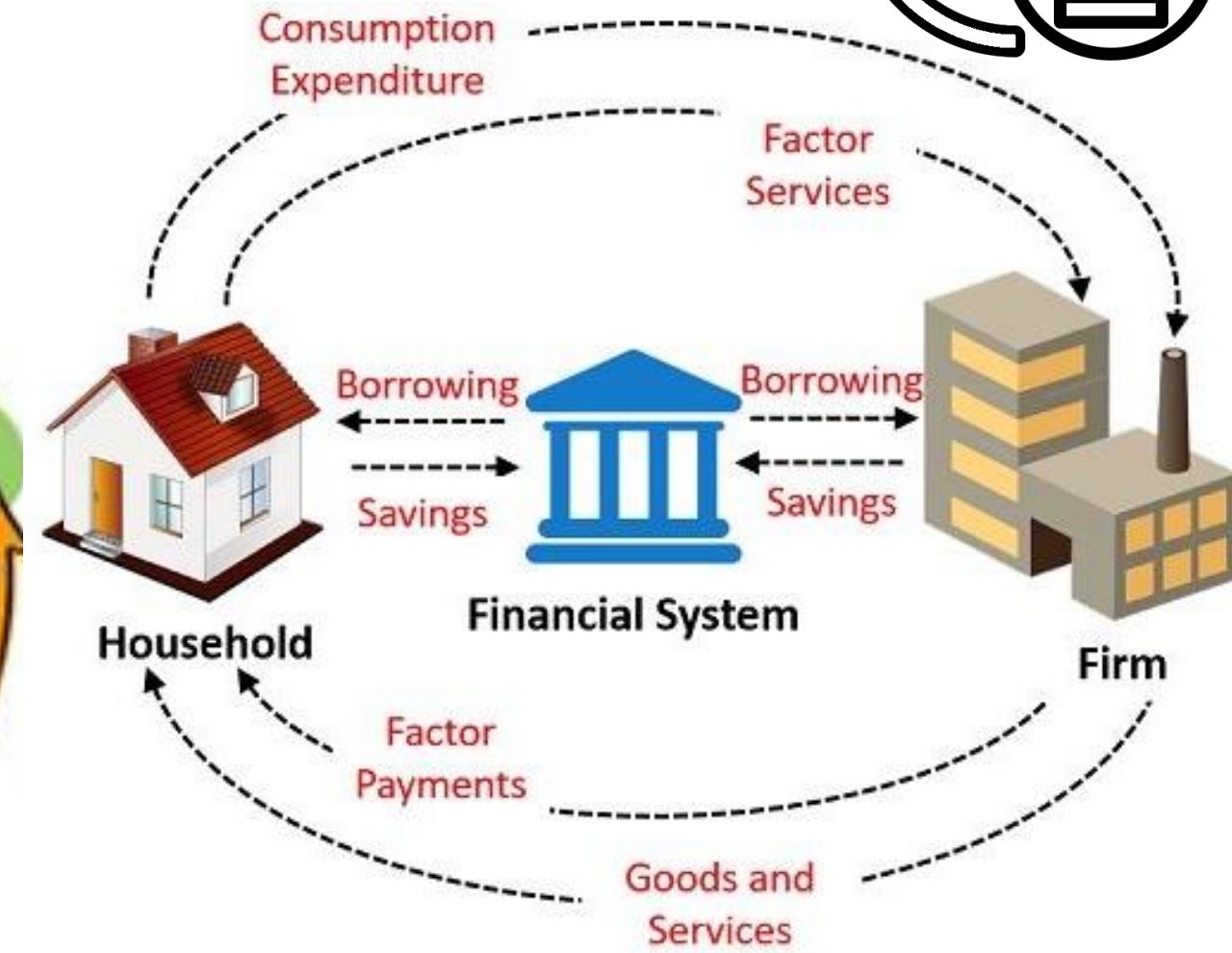
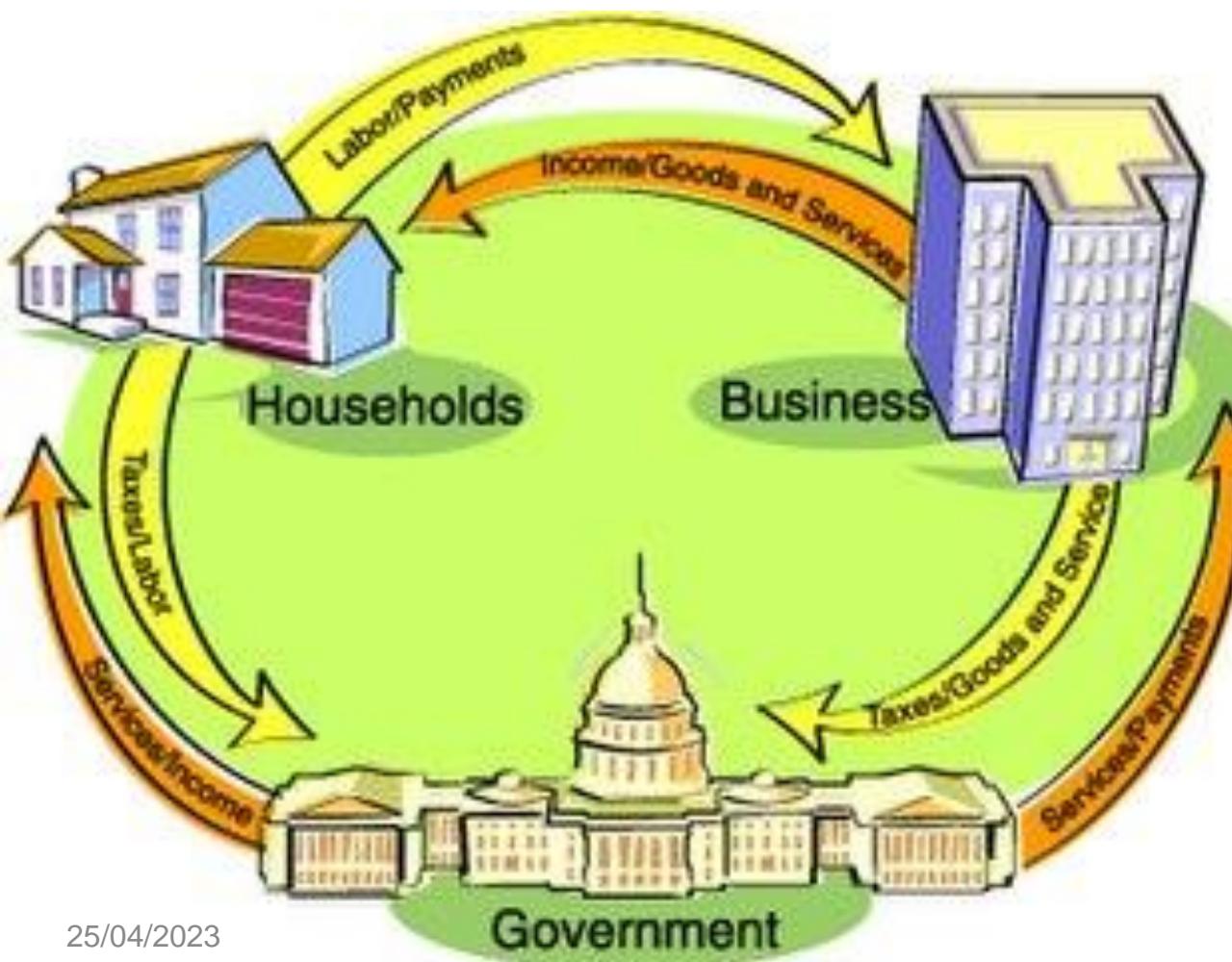
- Fees
- Processing time

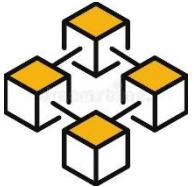
PROS	CONS
+ Instant ability to let customers pay for goods and services purchased online.	- No instant purchase confirmation and potential loss of sale as order and payment are separated in time.
+ Instant global reach	- Unable to reach the unbanked population
+ No gateway costs	- Not all banks or banks accounts support receipt of foreign currencies
+ No fraud (irreversible credit transfer)	- Additional bank fees (international remittance) for the payer could jeopardize payment
+ No PCI DSS requirements for the secure storage of sensitive consumer data	- Manual order and payment matching (reconciliation)



2.9. MONEY TRANSFER

Money circulation

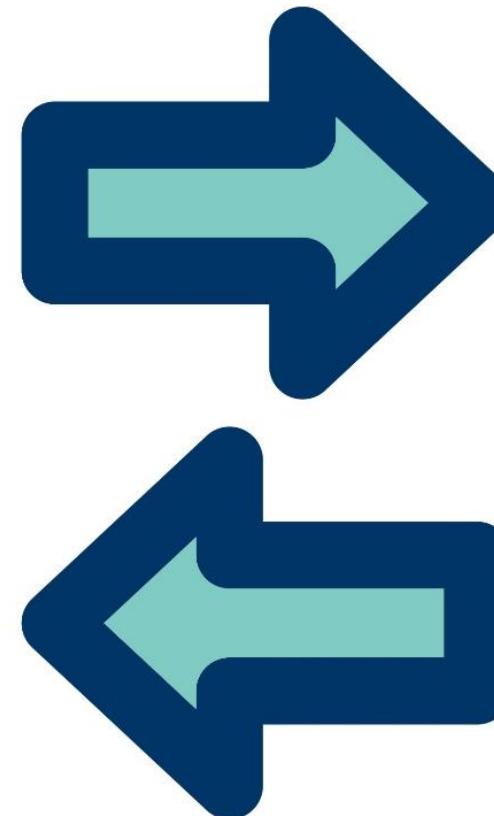


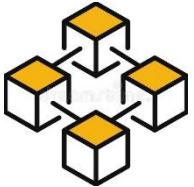


2.10. CURRENCY EXCHANGE

Foreign (currency) exchange (Forex):

Conversion of one currency into another at a specific rate.

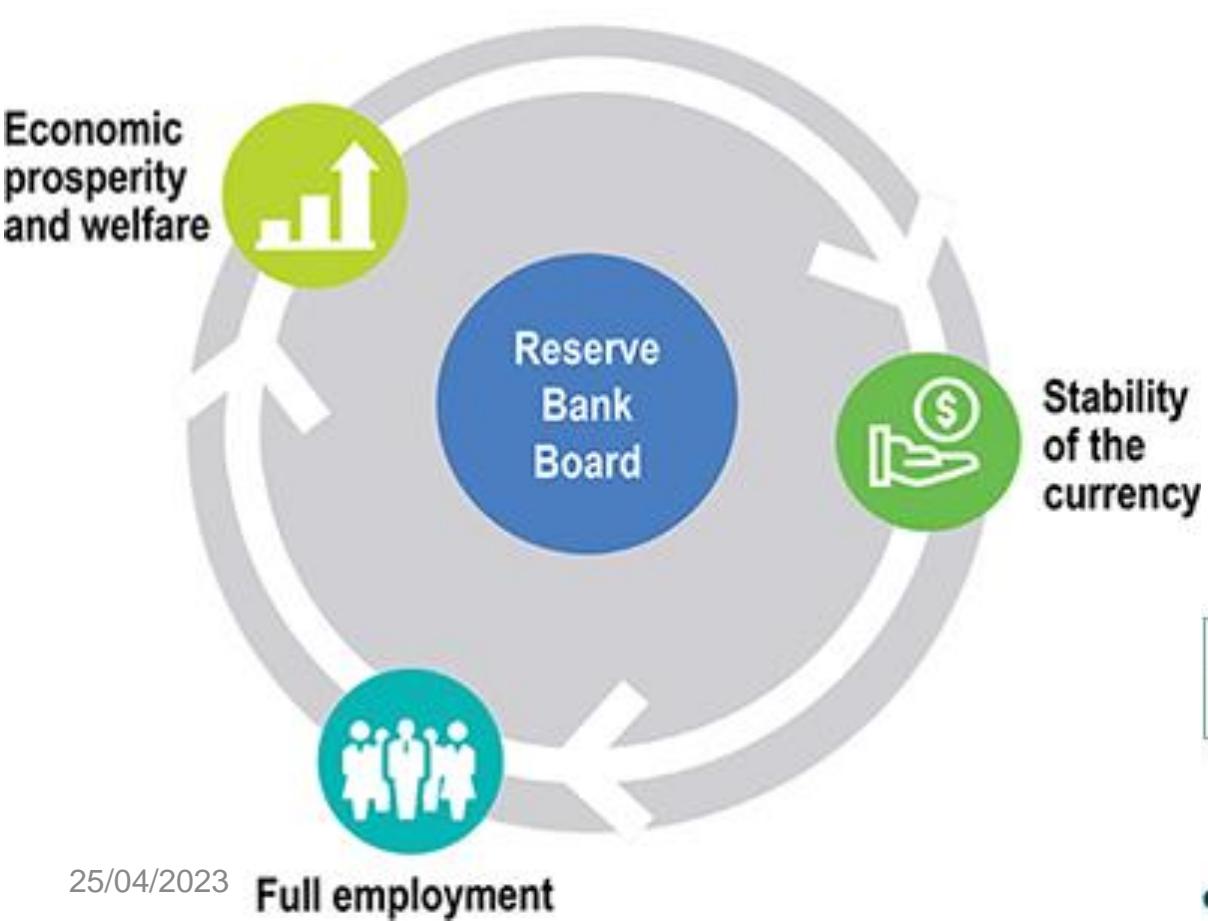




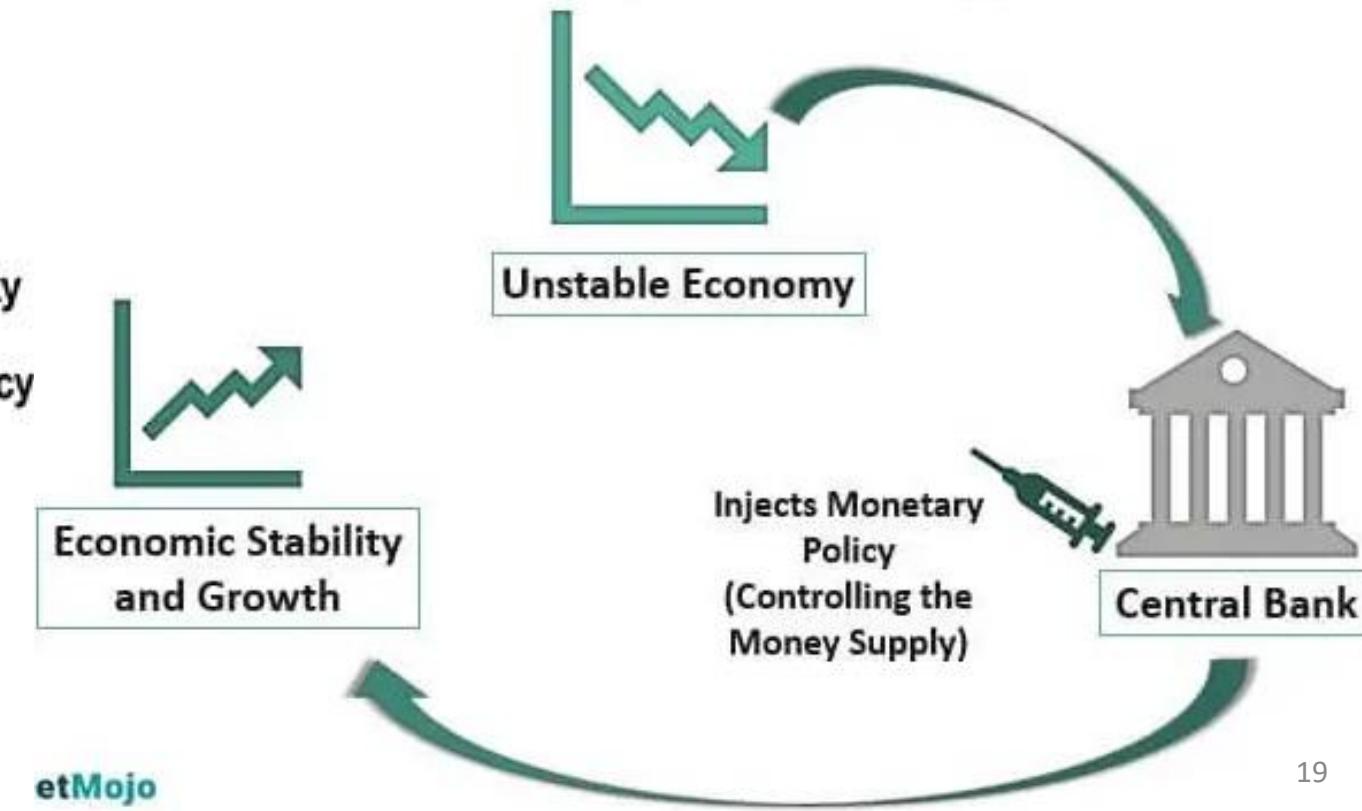
2.11. MONETARY POLICY

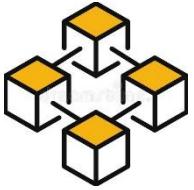
Central bank's action to:

- Establish national economic stability
- Fulfil other goals: unemployment, inflation, price instability, recession



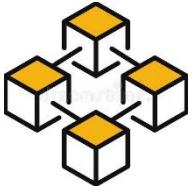
Monetary Policy





3. CRYPTOCURRENCY

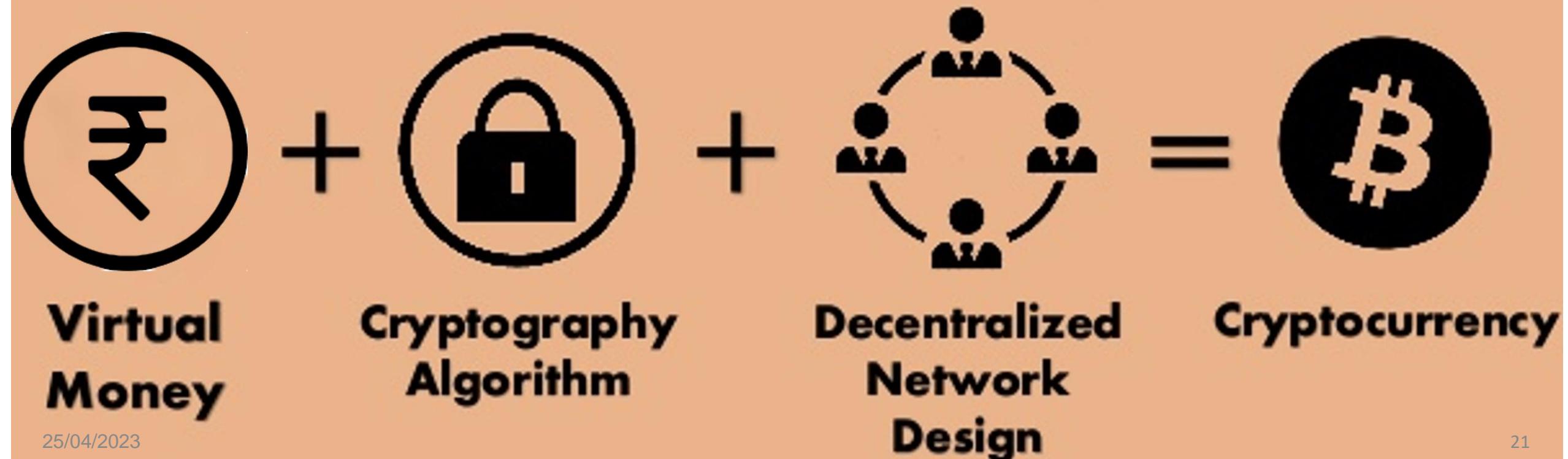
- 3.1. CRYPTOCURRENCY DEFINITION
- 3.2. TYPES OF CRYPTOCURRENCY
- 3.3. COMPONENTS OF CRYPTOCURRENCY
- 3.4. ACTORS OF CRYPTOCURRENCY
- 3.5. FEATURES OF CRYPTOCURRENCY
- 3.6. CRYPTOCURRENCY VS OTHER CURRENCY
- 3.7. CREATE CRYPTOCURRENCY
- 3.8. DESTROY CRYPTOCURRENCY
- 3.9. CRYPTOCURRENCY SUPPLY
- 3.10. CRYPTOCURRENCY TRANSFER
- 3.11. CRYPTOCURRENCY EXCHANGE

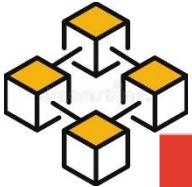


3.1. CRYPTO CURRENCY DEFINITION

Cryptocurrency definition:

What is a Cryptocurrency ?





3.1. CRYPTO CURRENCY DEFINITION

Cryptocurrency



Cryptocurrency is a medium of exchange, created and stored electronically on the blockchain, using cryptographic techniques to verify the transfer of funds and an algorithm to control the creation of monetary units. Bitcoin is the best known example.



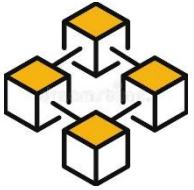
Has no intrinsic value in that it is not redeemable for another commodity, such as gold.



Has no physical form and exists only in the network.



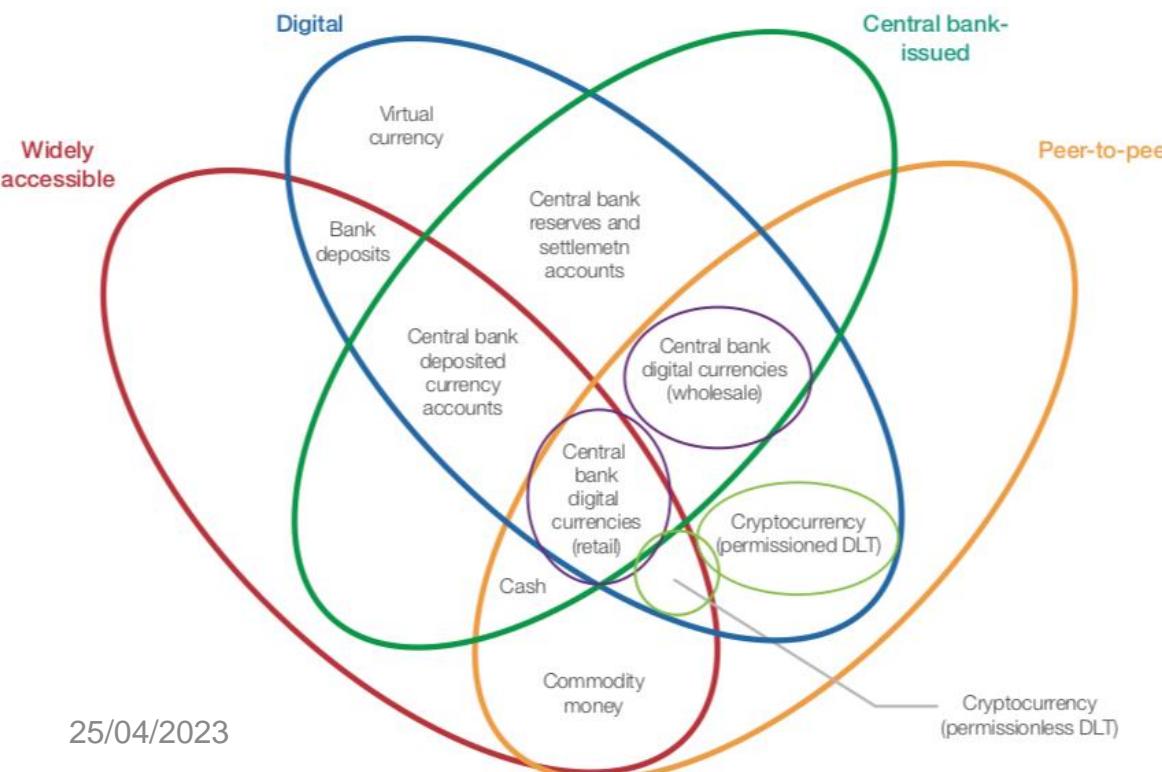
Its supply is determined by the protocol, not a central bank and the network is completely decentralized.



3.1. CRYPTO CURRENCY DEFINITION

Cryptocurrency:

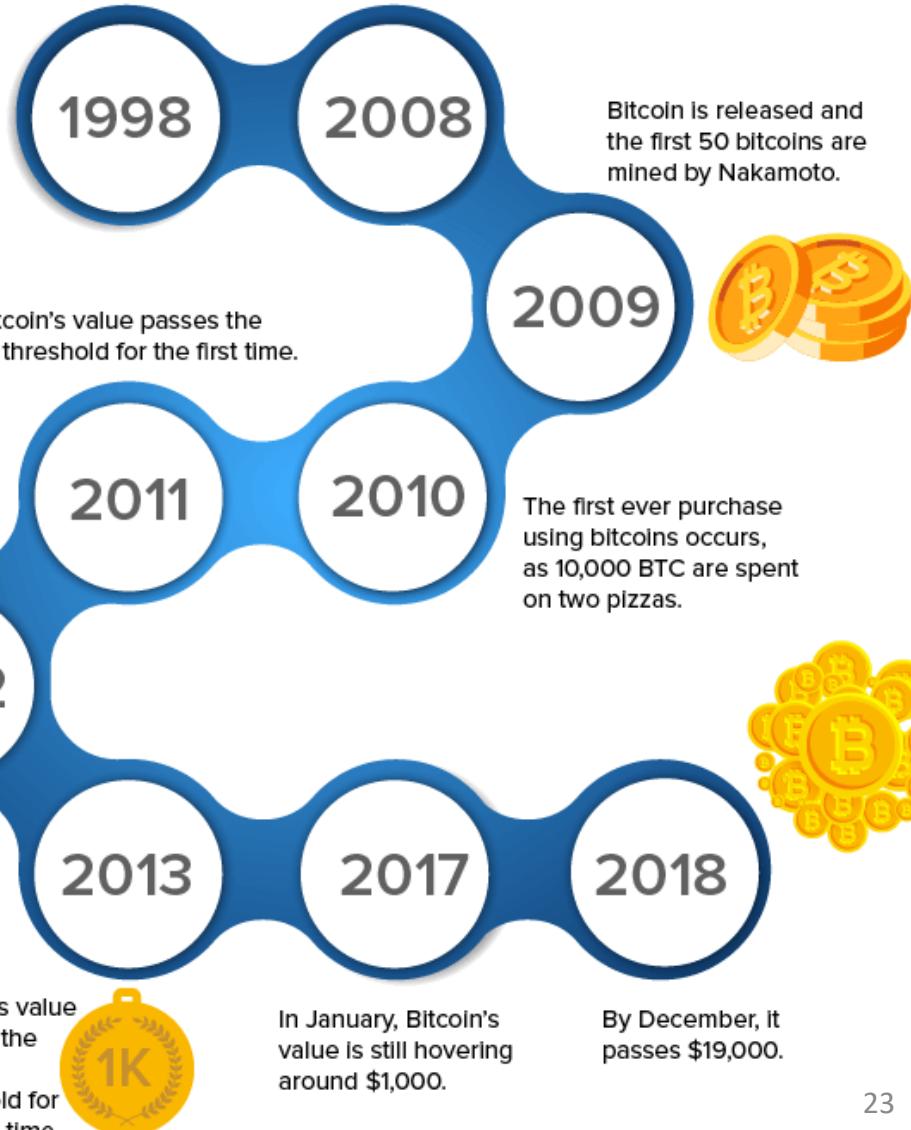
- Forms of currency (digitally/virtually)
- Uses cryptography to secure transactions.
- Is backed by blockchain technology

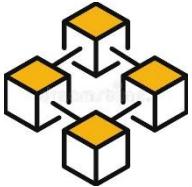


Nick Szabo theorizes "Bit gold", a virtual currency a proof-of-work system to solve. Bit gold never gets created.



"Satoshi Nakamoto" writes the whitepaper detailing coin.





3.2. TYPES OF CRYPTO CURRENCY



Coin



Token



A coin is a digital currency similar to the physical currency

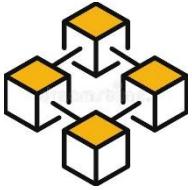
Coin operates on its own blockchain with its own protocol

Coins are purely used as a source of payments

A Token is a digital asset issued on a particular project

Token does not operate on their own blockchain

Tokens are used for payments and signing digital agreements



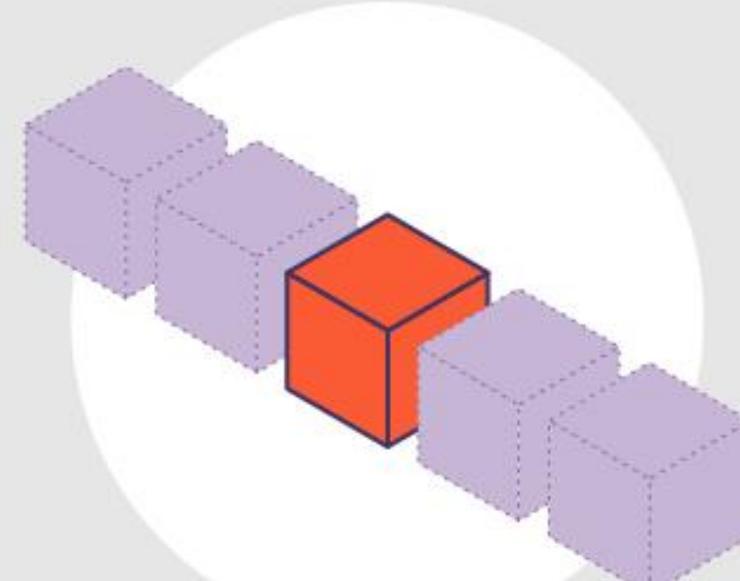
3.3. COMPONENTS OF CRYPTO CURRENCY

- Component:



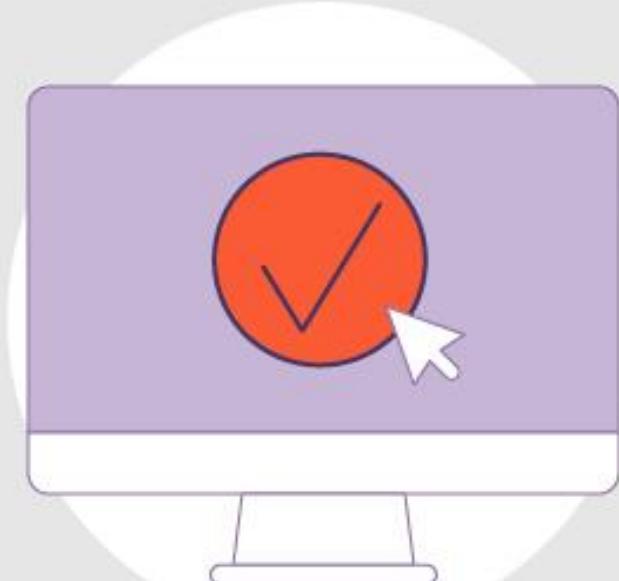
Cryptocurrency (crypto)

A digital currency derived from cryptographic encryption techniques designed to protect the network



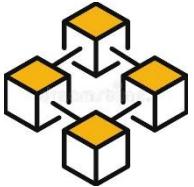
Blockchain

The underlying technology for cryptocurrencies, a public ledger that records transactions digitally



Smart Contracts

An irreversible contract that is built on code that exists on a blockchain, enabling anonymous contracts



3.4. ACTORS OF CRYPTOCURRENCY



Private
Actors



Institutional Investors

- ▶ Harvard Endowment Fund
- ▶ Crypto Hedge Funds



Cryptocurrency Exchanges

- ▶ Bitstamp
- ▶ Coinbase



Banks & Finance

- ▶ J.P. Morgan
- ▶ Fidelity Investments
- ▶ Swissquote



Power & Utilities

- ▶ RWE

Source: Investopedia, Reuters



Public
Actors



Organizations

- ▶ Crypto Valley Association



Central Banks

- ▶ Sweden
- ▶ Saudi Arabia
- ▶ China



Governments

- ▶ Venezuela

Source: Financial Times, Coindesk, Brookings, Library of Congress



Applications



Wallets

- ▶ Trezor
- ▶ Exodus



Payments

- ▶ Coinbase Visa
- ▶ Bitcoin



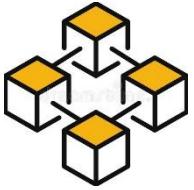
Banking

- ▶ Nexo
- ▶ Bitwala



Cross-border Transactions

- ▶ Ripple (XRP)
- ▶ Bitpay



3.5. FEATURES OF CRYPTO CURRENCY

Privacy

Anonymized transactions protect users' data through cryptographic techniques

Source: Investopedia



Access

Providing a new financial model for 1.7B unbanked individuals around the world

Source: Financial Times



Efficiency

Steep reductions in settlement time and efficacy could save consumers \$16B annually

Source: Investopedia



Security

Providing immutable, traceable records of security-rich transactional networks

Programmable Money

Smart contracts could drastically reduce manual and administrative work, bypassing them altogether. It is the beginning of programmable money

Source: Investopedia

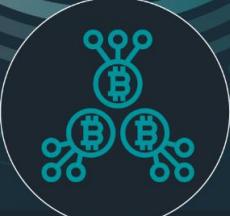
Cryptocurrency Characteristics



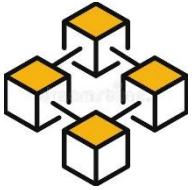
Trustless



Immutability



Decentralisation



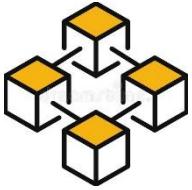
3.5. FEATURES OF CRYPTOCURRENCY

ADVANTAGES

- ❖ Decentralization
- ⌚ Fast and unlimited transactions
- ✉ Low transaction fees
- 🌐 Accepted internationally
- 👤 Transparency and anonymity

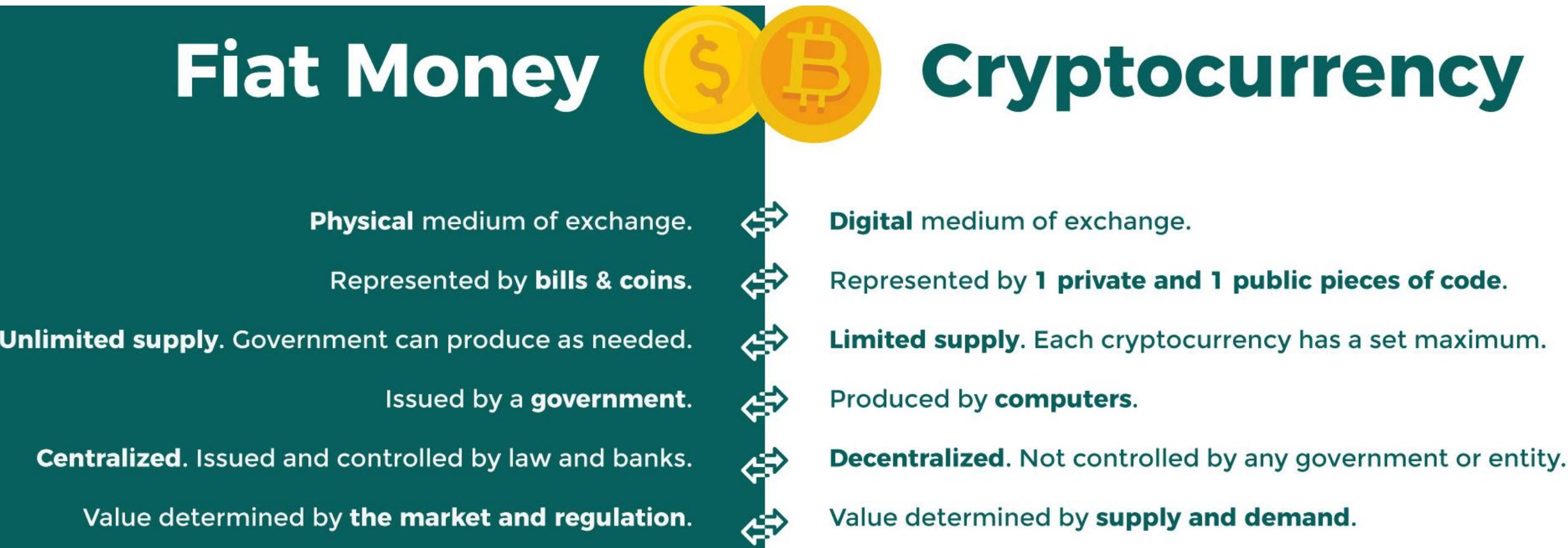
DISADVANTAGES

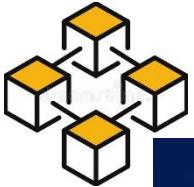
- ✖ Limited acceptance
- 〽 High volatility
- ☒ Transactions are non-reversible
- 📁 Cryptocurrency storage



3.6. CRYPTOCURRENCY VS OTHER CURRENCY

Cryptocurrency:





3.6. CRYPTOCURRENCY VS OTHER CURRENCY

Digital Currency

Cryptocurrency

Digital currency is fully centralized

01

It is surrounded by legal frameworks

02

Transaction directories is kept secret

03

It is not encrypted

04

Cryptocurrency is fully decentralized

01

It is not surrounded by legal frameworks

02

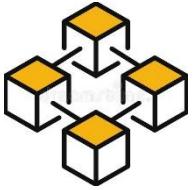
Transaction directories is visual to all

03

It is highly encrypted

04

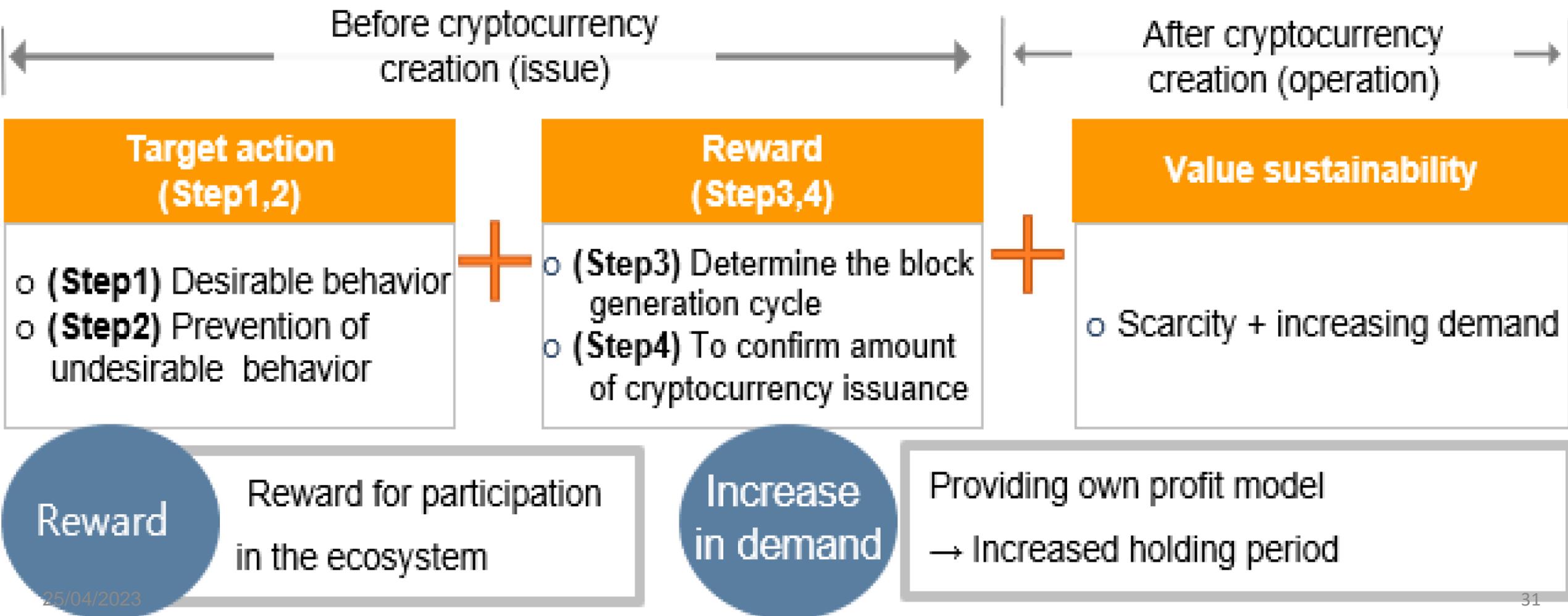
Digital
Currency Vs
Cryptocurrency

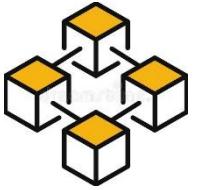


3.7. CREATE CRYPTOCURRENCY

Ways to create cryptocurrency:

Create new blockchain; Fork existing blockchain; Use existing blockchain Platform

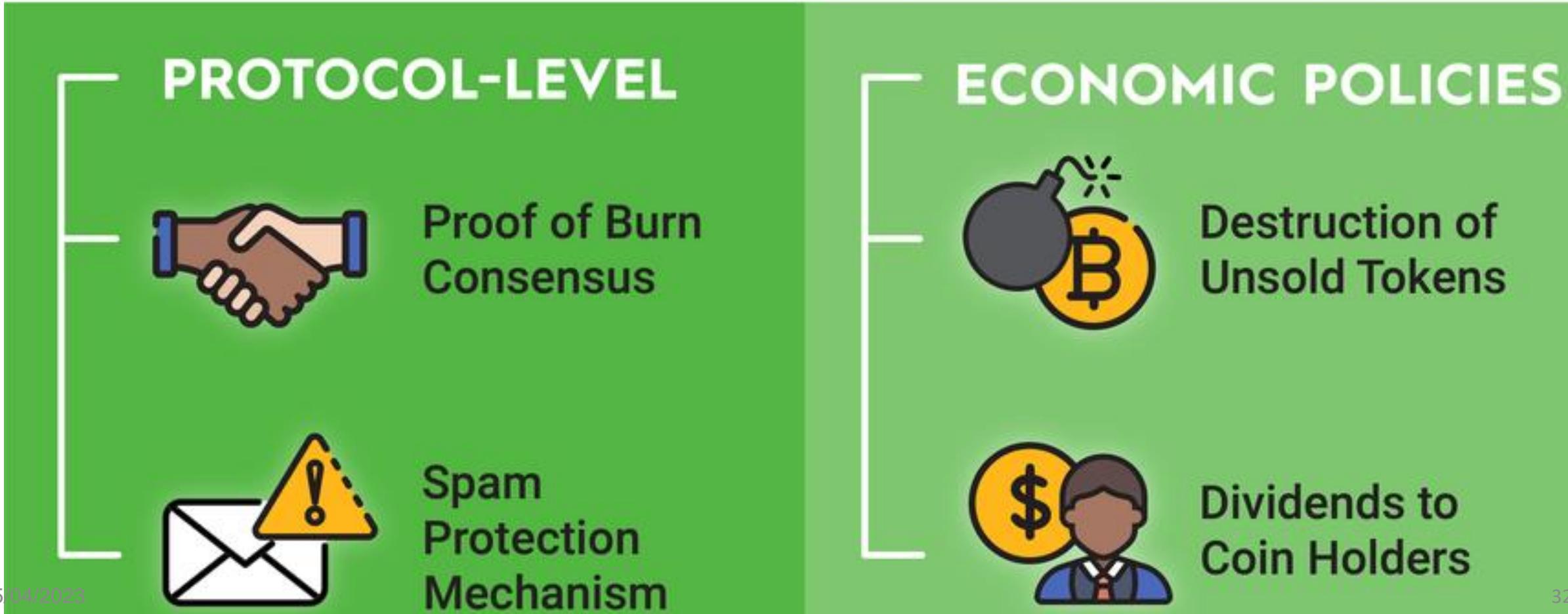


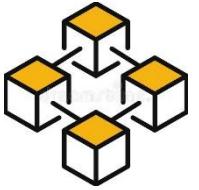


3.8. DESTROY CRYPTOCURRENCY

- Destroy cryptocurrency: sent to an unusable wallet address (burn, eater address)
- Proof of burn: consensus algorithm to validate and add transactions

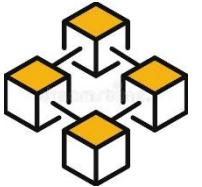
CRYPTOCURRENCY COIN BURNING



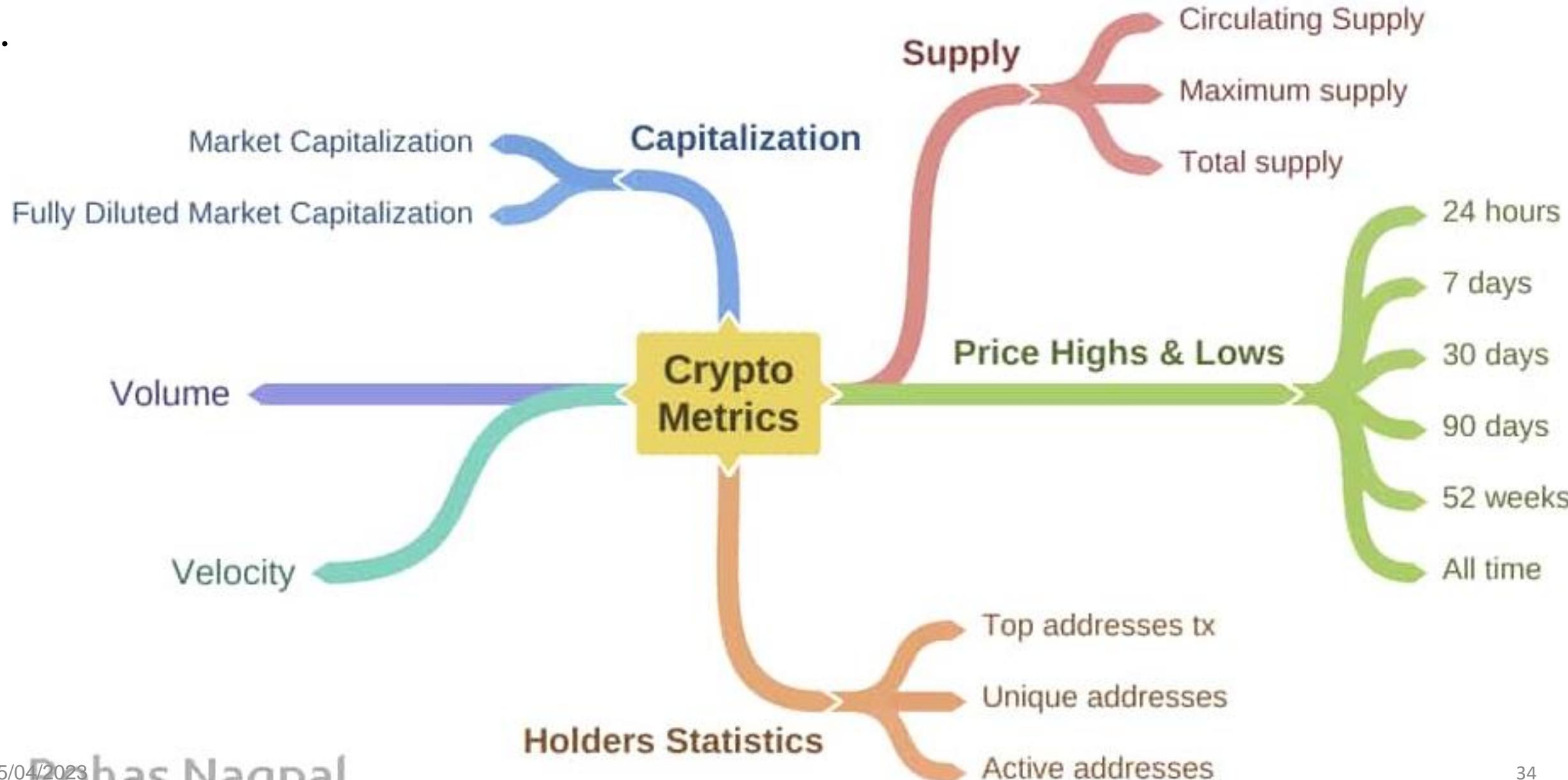


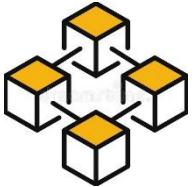
3.9. CRYPTOCURRENCY SUPPLY

	Total supply	Maximum supply	Circulating supply
Change in supply	Sum of all coins, including the undistributed yet.	All coins that will ever come into existence.	Number of tokens currently in existence and available for trading.
Burned and locked-up coins	Doesn't include burned or inaccessible coins.	Coins that have yet to be mined.	Doesn't include locked-up or reserved tokens.
Change in supply	Supply can change over time.	Harder to change supply over time.	Supply can change over time.



3.9. CRYPTOCURRENCY SUPPLY

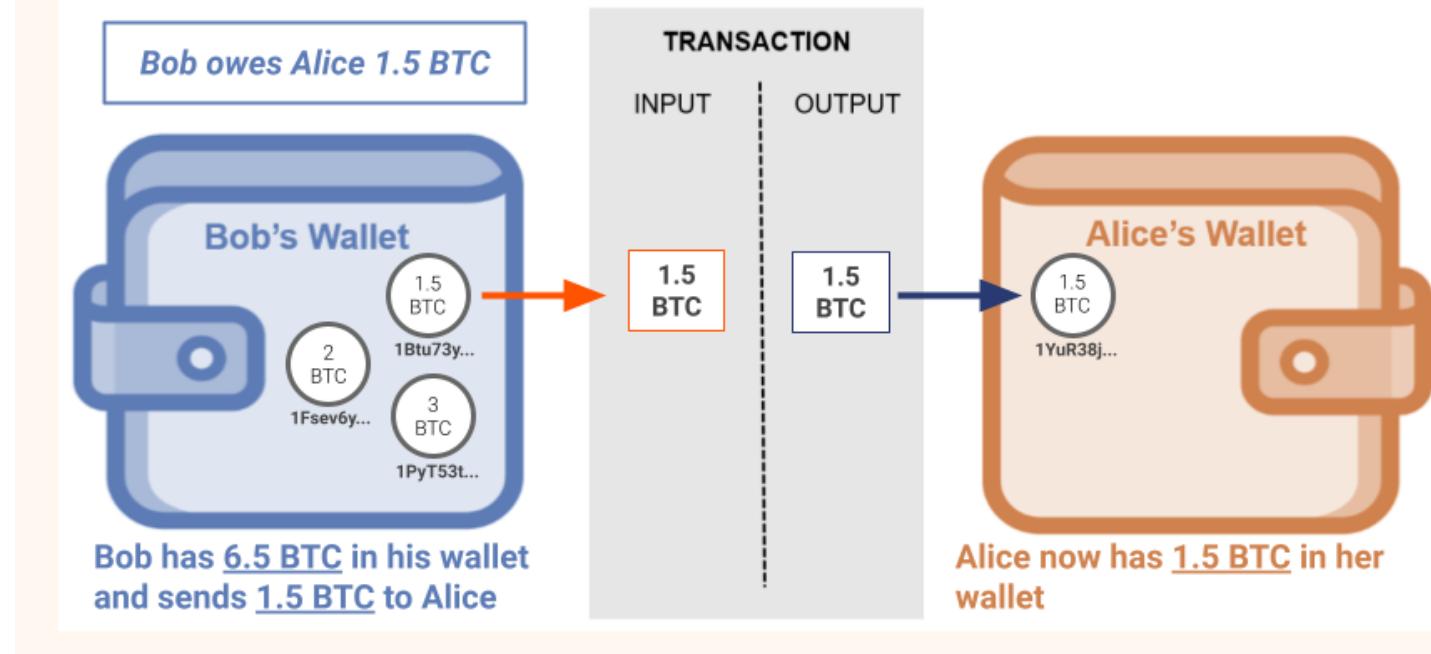




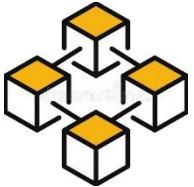
3.10. CRYPTOCURRENCY TRANSFERS

Visualizing a cryptocurrency transaction

- Network fees: paid to incentivize miners.
- Wallet fees: store the cryptocurrency
- Exchange fees: commissions charged by exchanges.



Cryptocurrency holder's behavior	Sell on the exchange	+	Purchase of goods or services	+	Continuous holding
Ecosystem side	Most common		Securing own profit		The most rational choice
Phenomenon	<ul style="list-style-type: none">o Negative impact on ecosystemo Reduced long-term use of money		<ul style="list-style-type: none">o Need to secure structureo Very limited occurrence		<ul style="list-style-type: none">o Increasing future value

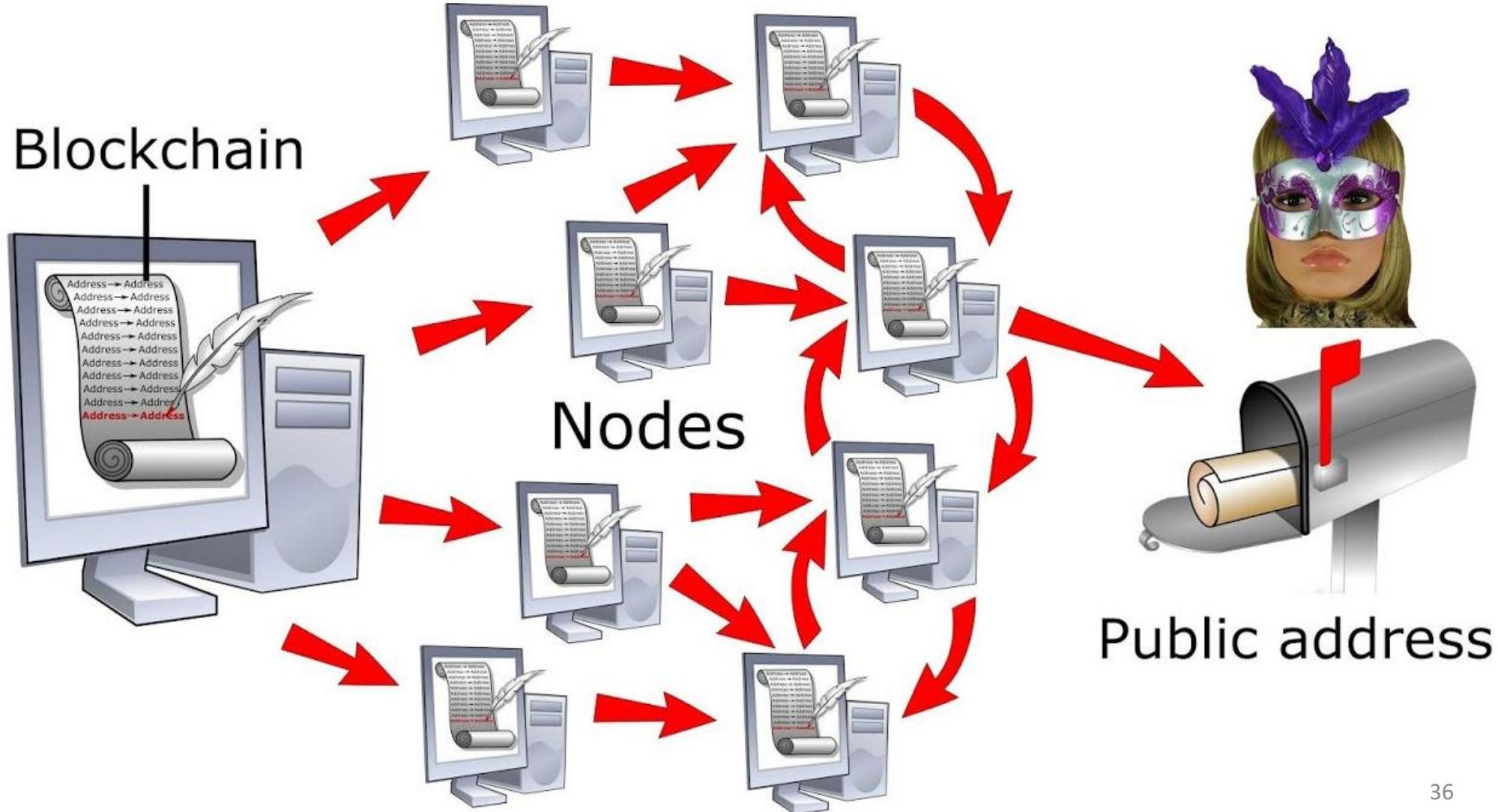


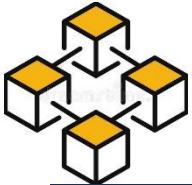
3.10. CRYPTOCURRENCY TRANSFERS

Cryptocurrency transaction

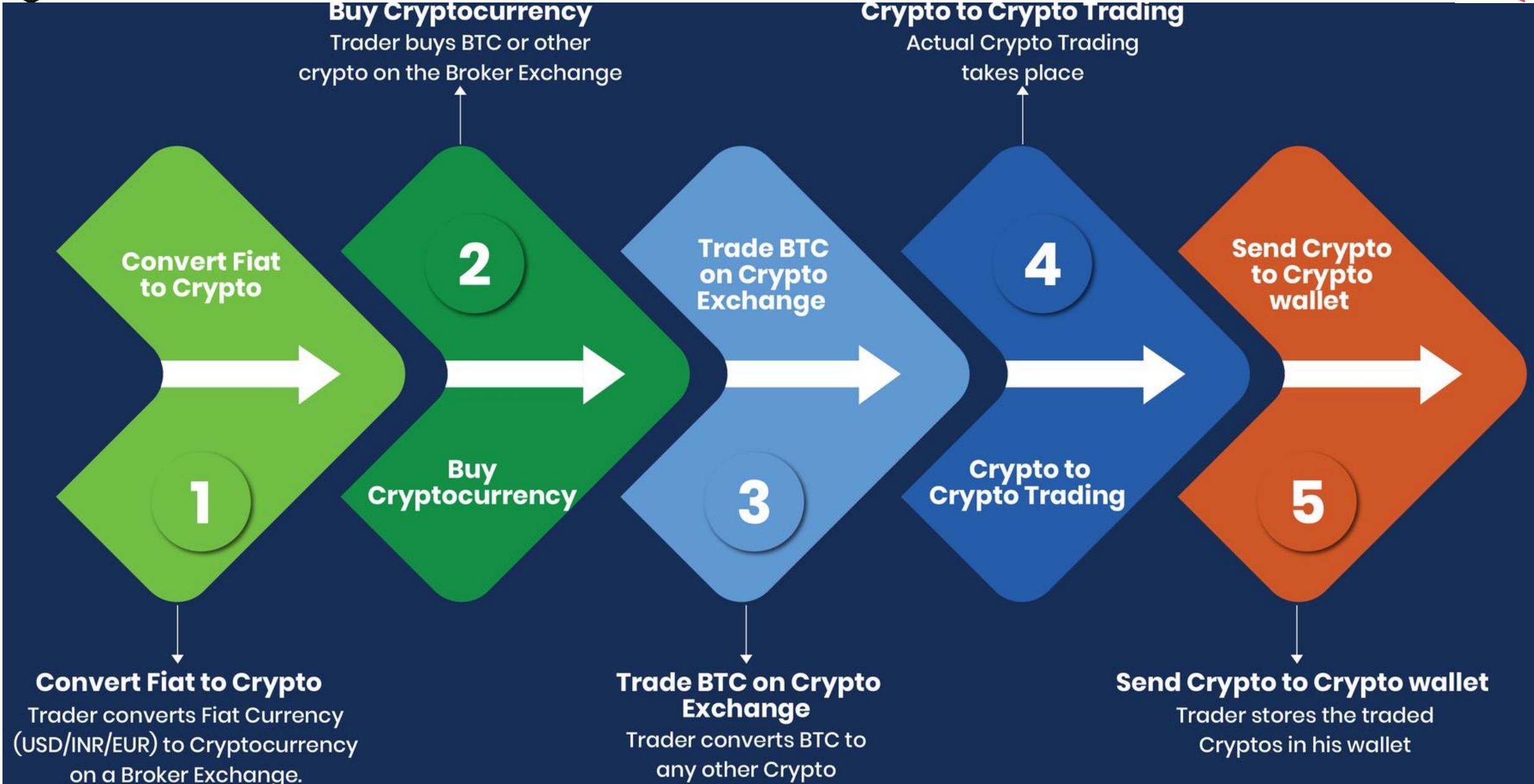


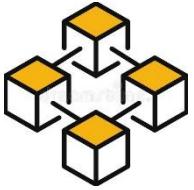
Private key





3.11. CRYPTOCURRENCY EXCHANGE



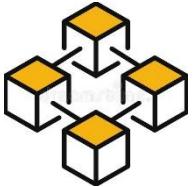


4. CRYPTOCURRENCY APPLICATIONS

4.1. INTRODUCTION

4.2. CRYPTOCURRENCY APPLICATIONS

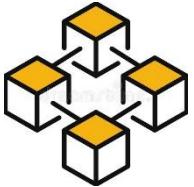
4.3. TYPE OF CRYPTOCURRENCY APPLICATIONS



4.1. INTRODUCTION

- Everything about cryptocurrency: investing, trading online.
- To initiate/participate in crypto-related activity, need a specialized tool.





4.2. CRYPTOCURRENCY APPLICATIONS

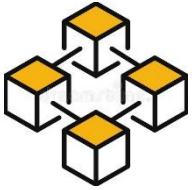
Cryptocurrency application: software

- Store cryptocurrencies.
- Buy cryptocurrencies
- Sell cryptocurrencies.



Use of Cryptocurrency:

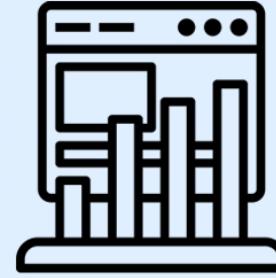
- Transfer
- Payment
- Investment



4.3. TYPE OF CRYPTOCURRENCY APPLICATIONS



Cryptocurrency wallet



Statistics aggregation platform

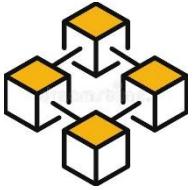


Cryptocurrency trading application

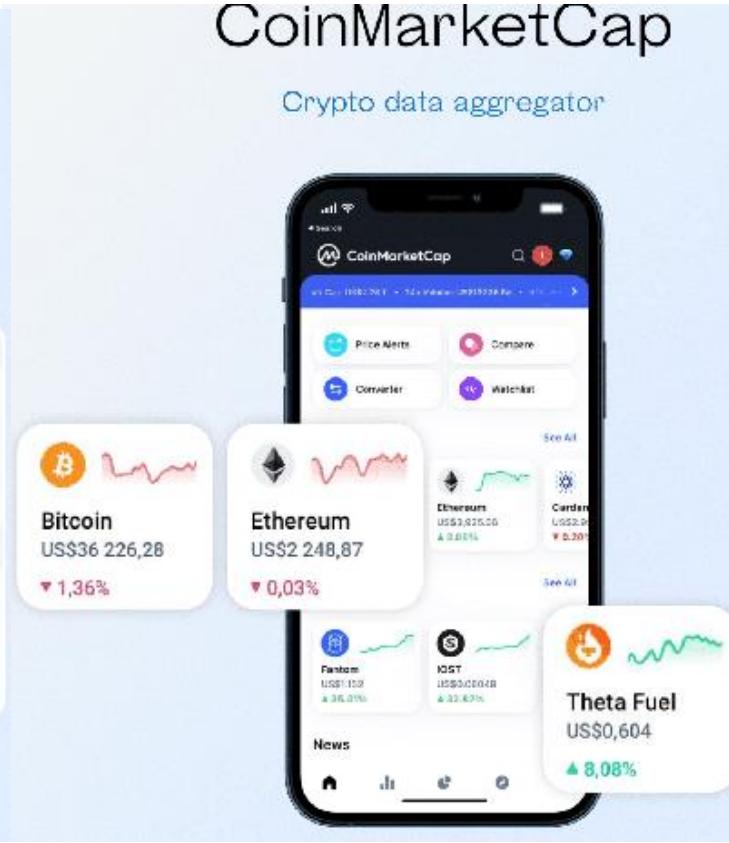


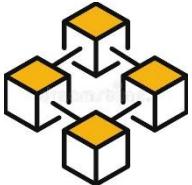
E-commerce app

- A cryptocurrency wallet is software that stores the private and public keys of customers
- When developing such a cryptocurrency application, you need to pay maximum attention to the UI/UX design
- It can be common cryptocurrency exchanges, decentralized exchanges, or peer-to-peer trading platforms
- Let's say you have an online store or exchange service and you want to accept payments in Bitcoin and Ether



4.3. TYPE OF CRYPTOCURRENCY APPLICATIONS

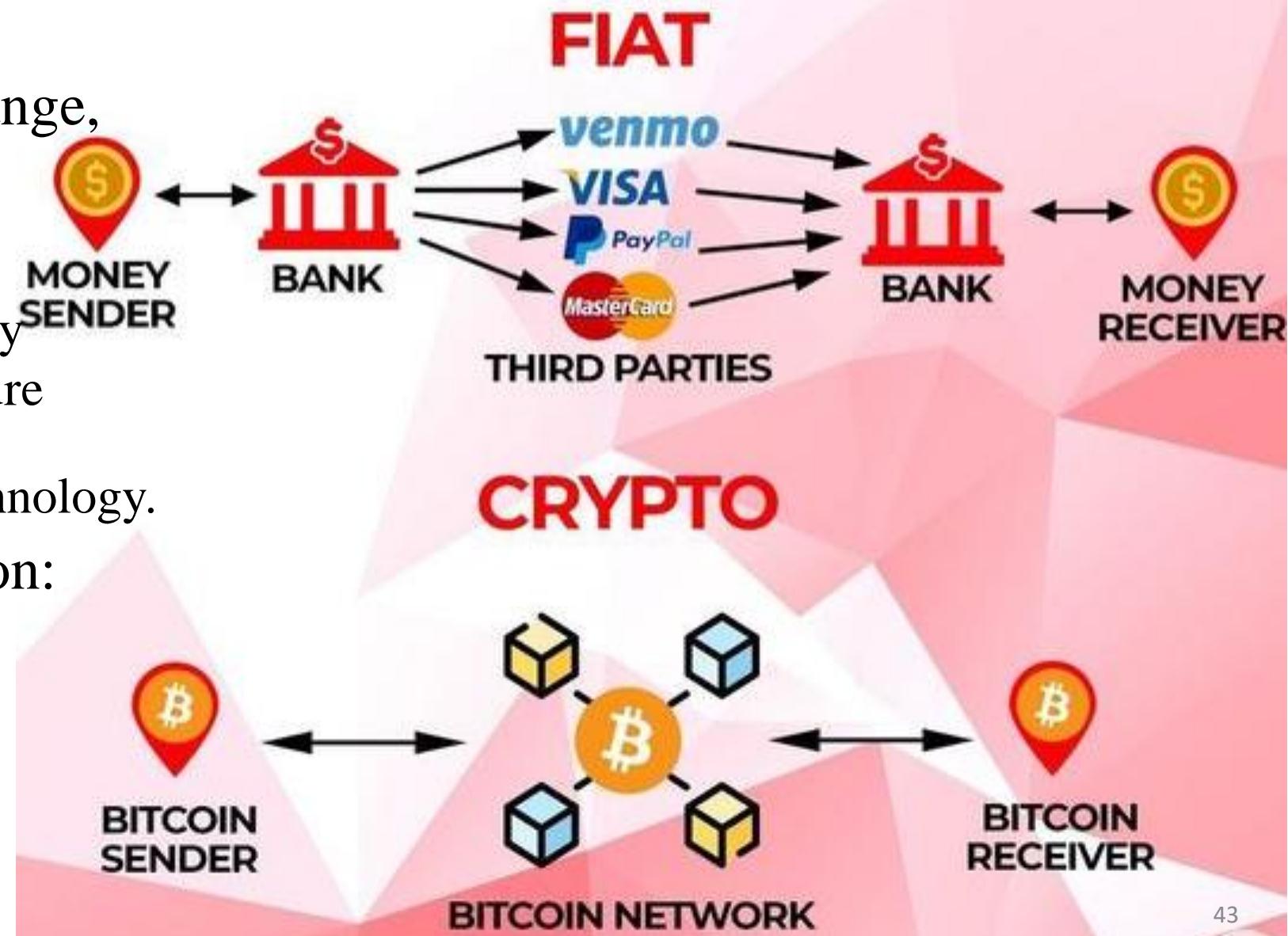


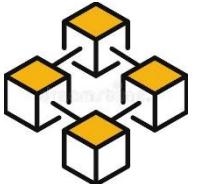


5. SUMMARY

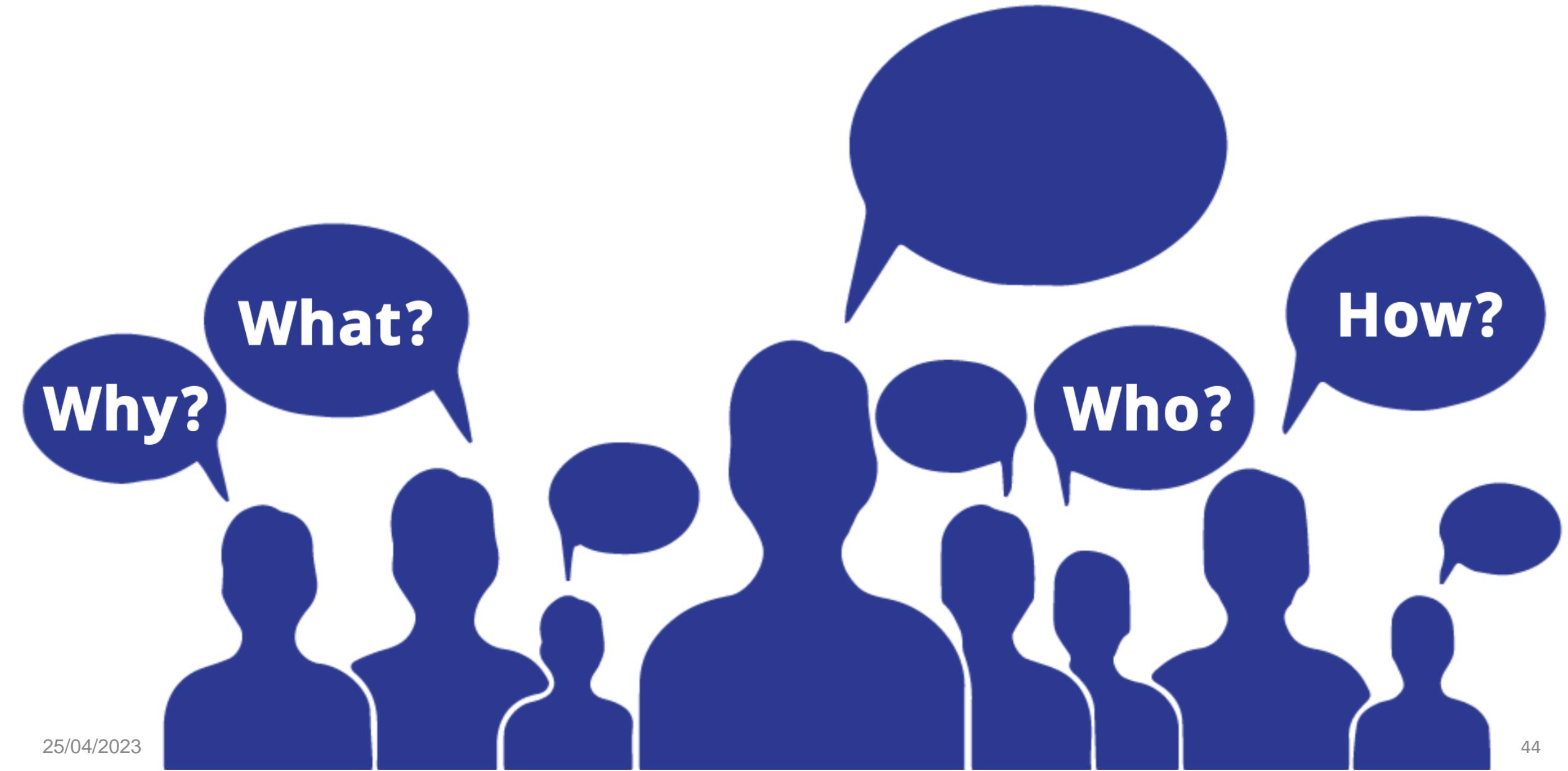
WHICH IS BETTER?

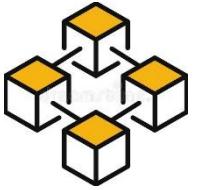
- Money: medium of exchange, payment.
- Cryptocurrency:
 - Forms of digitally currency
 - Uses cryptography to secure transactions.
 - backed by blockchain technology.
- Cryptocurrency application:
 - Store
 - Buy
 - Sell





6. DISCUSSION





FINISH

Thank You