



Master in Planning and
Management of Tourism Systems



Blockchain & Web 3.0

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INTRODUCTION

Blockchain changes
the way information is
shared between
people



Every time you send a message on Whatsapp, it is sent firstly to a **central server**, then the server send it to the person you wrote it, and not to someone else



When you buy something with your credit card, the server of the bank check if you have enough credit in your bank account and only then send your money to the seller

When you book an accommodation from an online travel agency, its servers contact your bank for the payment, inform the host of your booking, remove the room/flat from the list of available ones, and so on



When you **vote**, you give your identity card to the representants of the institutions, enter a cabin, draw some crosses on a sheet, put the sheet inside a box



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All these **intermediaries** that manage **exchanges of informations** between people have a similar goal: to grant a service, taking **responsability** for its **correct execution**

Today most human activities are centralized: they are run by institutions, enterprises, multinationals, agencies. Even Internet



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We need them to guarantee that all these activities run well, until now there was no other way



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We need them to guarantee that all these activities run well, until now there was no other way

So we give them our data or our products, and they organize and coordinate all the operations

This system works well, save for two things: you need to **trust them**, because you have no other alternative, and you need to **pay them** for their services

The advantage of Blockchain is that of removing all these intermediaries, shifting the trust from people to algorithms.



Blockchain algorithm is safe from any financial bankruptcy, social revolutions, hackers, wars, and even from atomics

Thus, you won't need to give your trust and personal data to external entities anymore, e.g:

- Online travel agencies and portals as Airbnb, Booking.com, Tripadvisor
- E-commerce marketplaces as Amazon, E-bay and Alibaba
- Social media as Facebook and Twitter (X)
- Banks
- Notaries
- Insurance companies
- Public administrations

BANK

It is also free of charge: imagine what could it mean for millions of families the possibility to open a bank account for free, and accessing financial services also for free



Or imagine what it means for billions of tourists to book accommodations without paying commissions to online travel agencies, or for users of social media be free from the monopoly of Meta

The **blocking** of the bank account, withdrawal limitations, the **crack of Argentina** in 2001 and of **Greece** in 2007... all these crisis would have never happened with Blockchain

How does it work Blockchain technology?



While in the **physical world** the best way to protect an object is to hide it or keep inside a safe, in the **digital world** you can try a similar approach, by encrypting data and keeping it behind firewalls, but this isn't the optimal solution



The best way to protect data may seem at first the opposite of common sense: it consists in copying it and distributing it to as many people as possible

The hardware part of a blockchain is any peer to peer network (P2P): a network where each computer (node) is both a client and a server (e.g: BitTorrent)



The **software** of blockchain is the **algorithm** used to store and share the data in the blockchain network. The main difference from a normal storage system is that data is stored in **blocks** of **1 MB** each



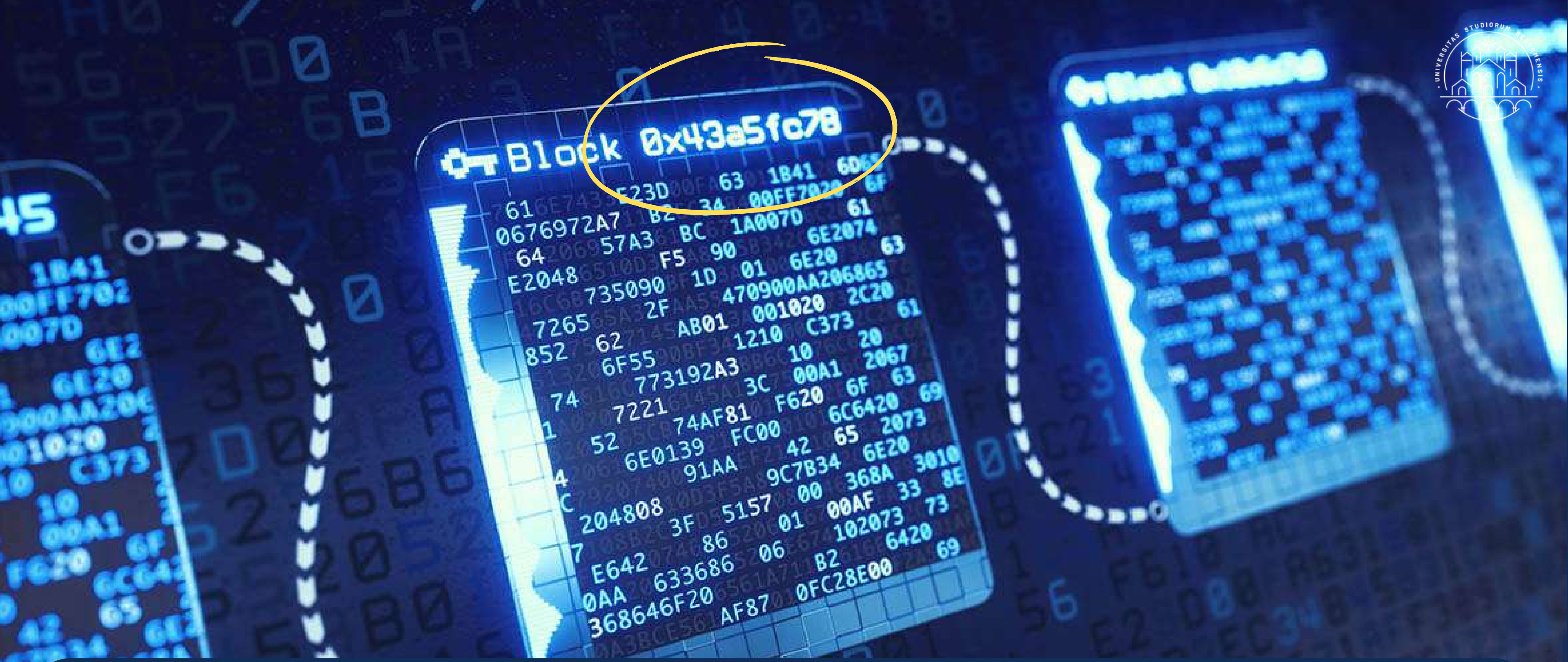
Every **node** of the network has a **copy** of **all** data blocks. In this way, there can be **no single owner** of the data: not even a multinational or a government can own all nodes



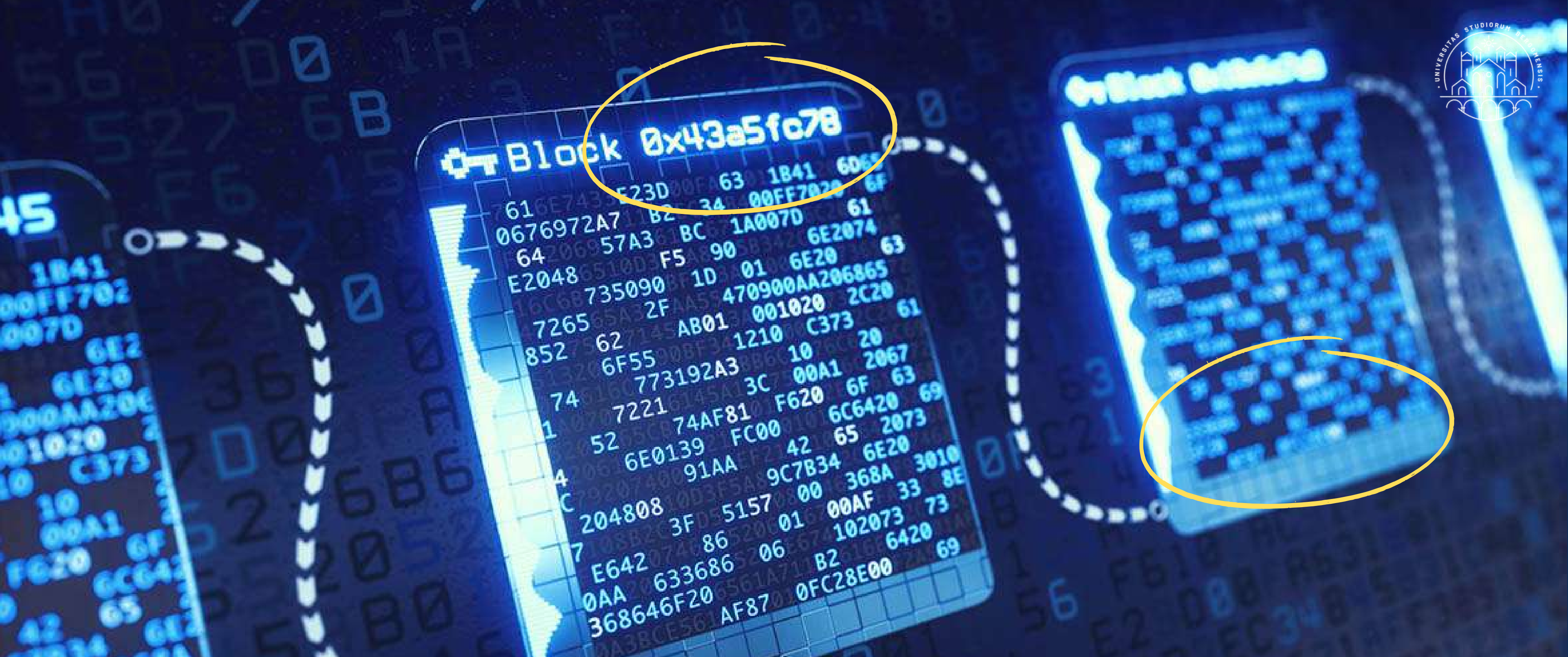
Each block is identified by a unique alphanumeric number called **hash**



Each block also store the hash of the previous block, that's how form a sequence of blocks, or chain



If an hacker try to manipulate or corrupt the data inside a block, also its hash changes



The new hash is now **different** from the hash in the next block that refers to the hash of the previous block



The chain is broken. The only way an hacker has to "repair" it would be to replace that reference with the hash of the previous block



However, any change to a block modifies its hash, so the chain **breaks again** and the hacker has to modify **all the hashes** of all following blocks of the chain to repair it

And he must also repair the blocks of all the other nodes of the network. All these operations takes forever (modifying a single block takes about 10 minutes due to cryptography). This is why Blockchain technology is so secure

For example, if you install on your smartphone an app to use **bitcoins** or another cryptocurrency, you become a **new node** of the bitcoin network, and you receive a **full copy** of its blockchain (its data)

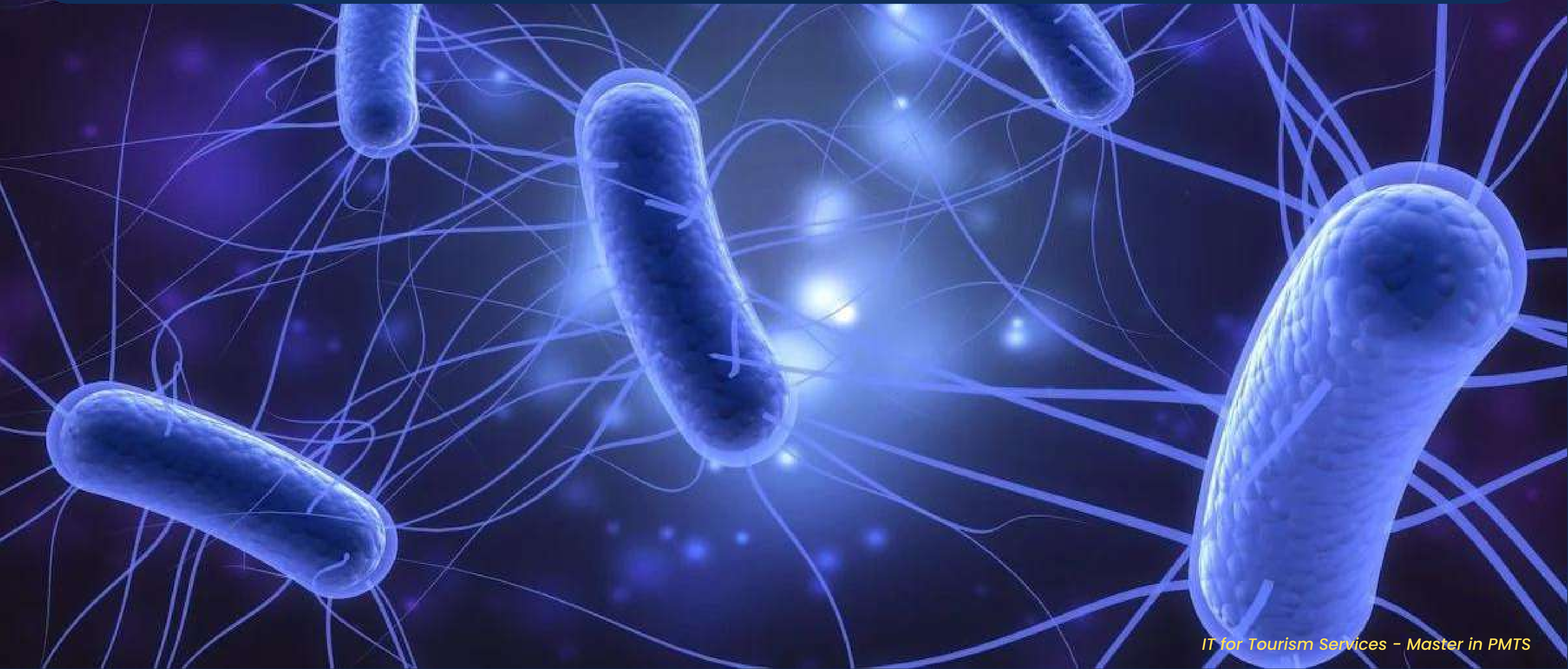
Any time you do an operation with the app (e.g: buy bitcoins, make a payment), a **new block** is created and sent not only to your node but also to **all the other nodes** of the bitcoin network.

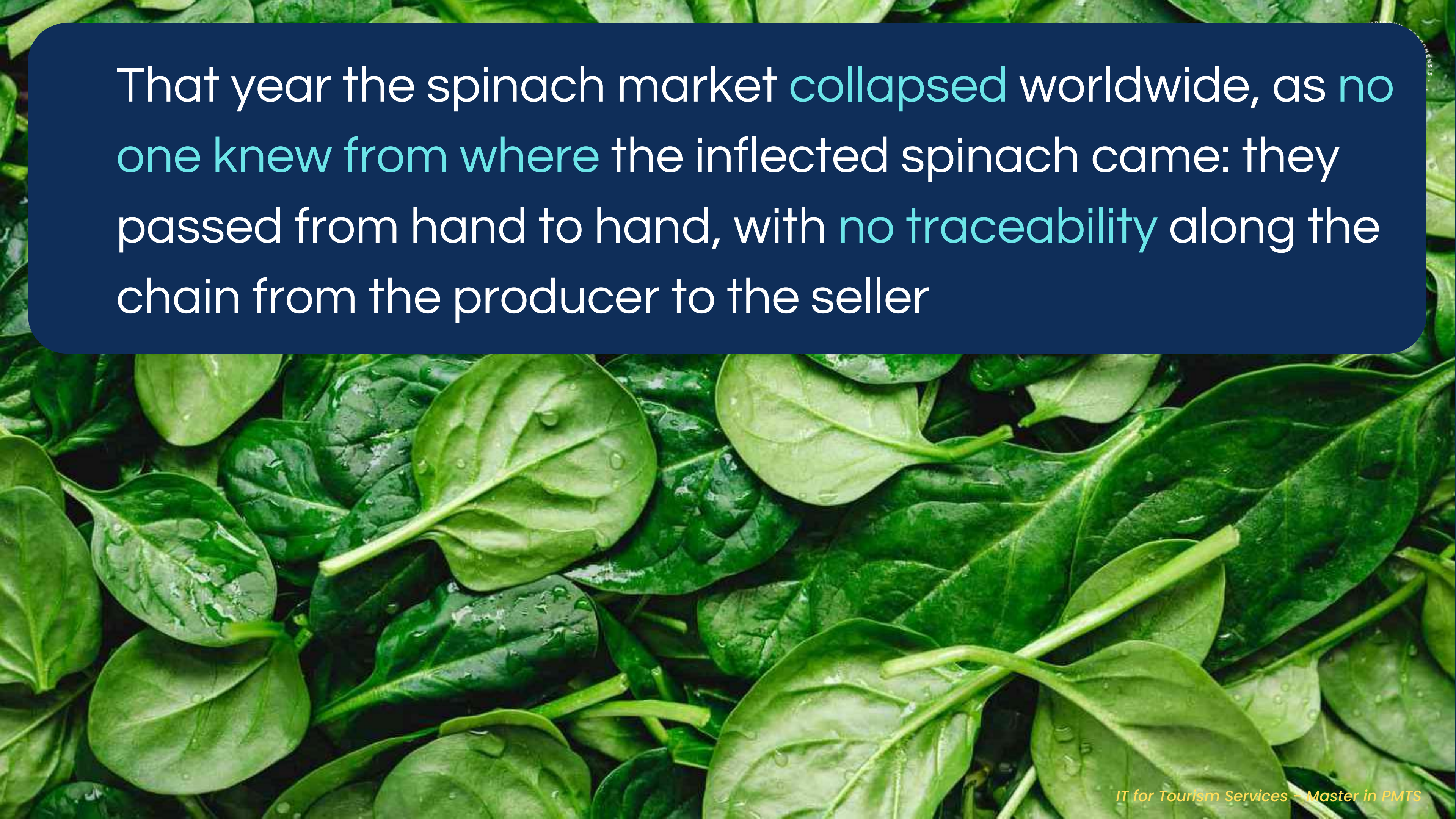
Other nodes verify that your version of the blockchain is the same they have. If yes, then each node adds the new block to its blockchain, else the new block is rejected by the nodes

This method of protecting data is the **opposite of common sense**: instead of **hiding data** or store it in a safe place, you make many copies and share them with all the world. Data is validated by the **consensus** of all parties involved.

Examples

In 2006 in USA there was an epidemic of the bacteria *Escherichia Coli*, caused by some infected spinach





That year the spinach market collapsed worldwide, as no one knew from where the inflected spinach came: they passed from hand to hand, with no traceability along the chain from the producer to the seller

Using a blockchain, all passages would have been well documented, transparent and of public access, going back to the farmer that produced the inflected spinach



Bitcoins is the name of a blockchain that stores digital currency. It is worth 800 billion dollars and no one has been able to steal a single cent until now.



Thanks to blockchain our smartphones could become the **only bank** we need. And a totally free bank, as it is now the calendar app or the clock app

The first blockchain was that of the **bitcoin**, created in 2009 thanks to paper of **Satoshi Nakamoto**, an unknown inventor named as a legendary **japanese hero** that fought against tyrannical regimes.

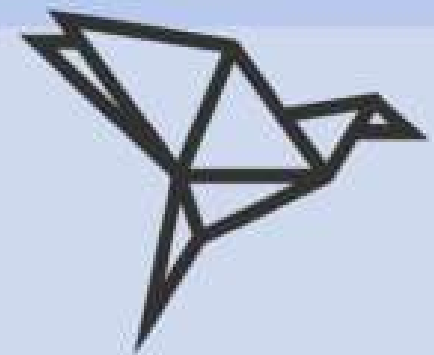
A large pile of discarded electronic components, including a keyboard, a motherboard, a hard drive, a CD-ROM drive, and various other parts, scattered on a light-colored tiled floor. The components are mostly silver, black, and blue, and appear to be remnants of a disassembled computer system.

Blockchain will make **obsolete** any system to **transfer information or money** between people.

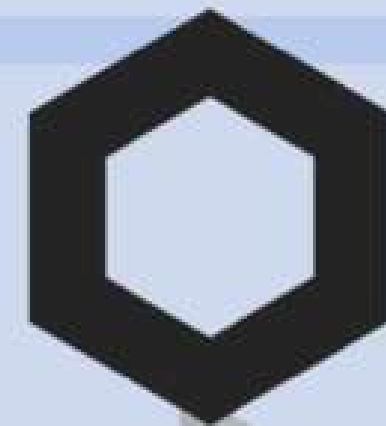


As automation will destroy most non-creative jobs, blockchain will destroy many intermediaries.

Ethereum is the name of a blockchain platform employed for **Smart Contracts**: contracts that bypass the intervention and fees of notaries, banks and insurance companies



ETHERISC



Chainlink

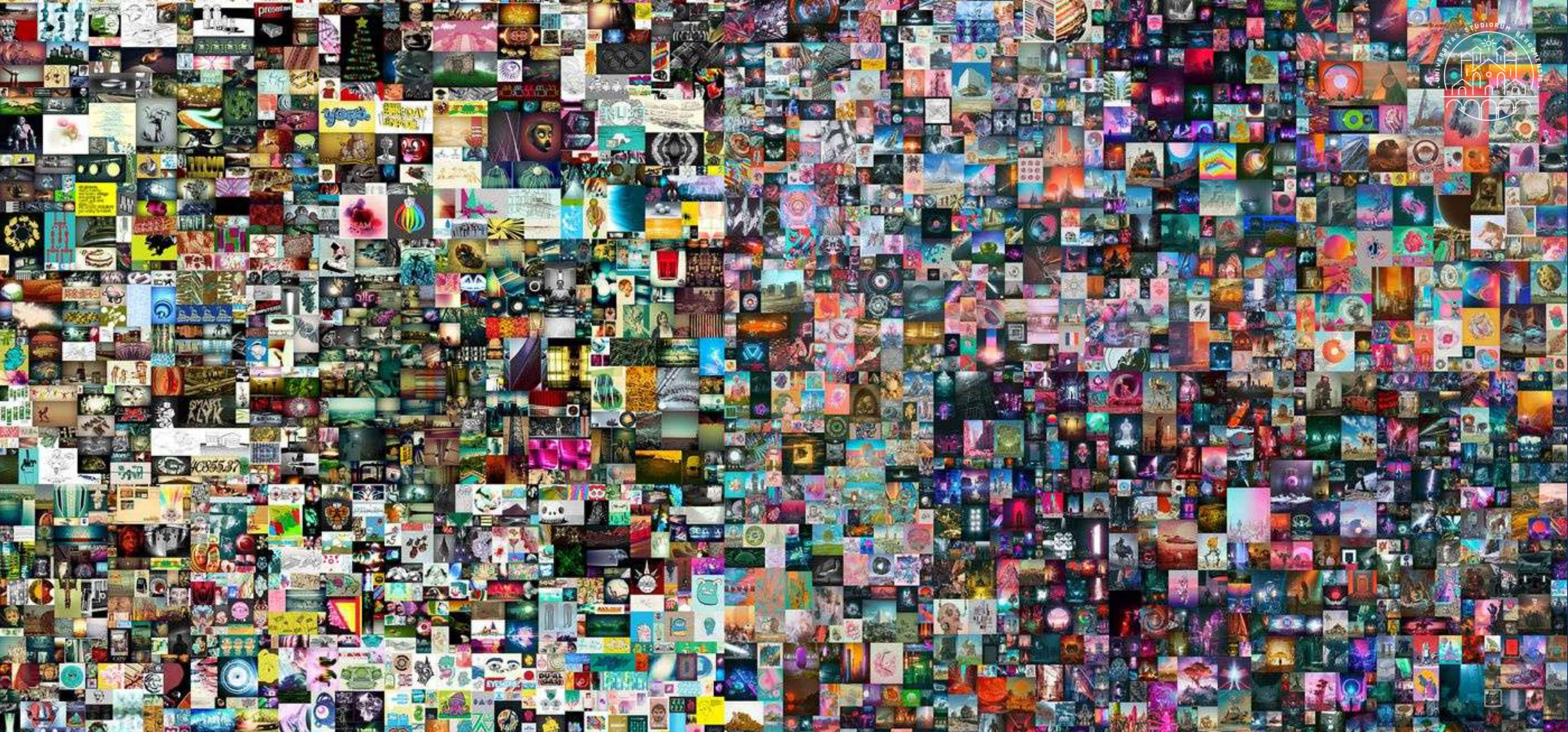
Etherisc is an blockchain insurance for flight travels. If your flight lands with two hours of delay, instead of getting mad, the blockchain immediately send you a message with the reimbursement already paid



Another popular type of smart contracts is called **NFT** (non-fungible token). It is an unique digital identifier stored in a blockchain (so it cannot be copied or substituted)



It is used to certify authenticity and ownership of real-world objects like artworks, collections, music registers, articles, but also digital objects like gif images and software



Artist Beeple sold the NFT of this digital artwork for 69M \$

Blockchain improves the accuracy of luggage tracking across the entire travel, as luggage changes hands from one flight operator to the other



You would no longer need to exchange currency when you travel to another country or fear credit cards thefts if you can pay with cryptocurrencies too (e.g: bitcoins)



Governments of heavily touristic countries are supporting the use of cryptocurrencies and even considering creating their own cryptocurrencies





User reviews of travel destinations will be more truthful because blockchain guarantees that only reviews from verified profiles are taken into account, achieving better transparency and increasing consumer trust

Winding Tree

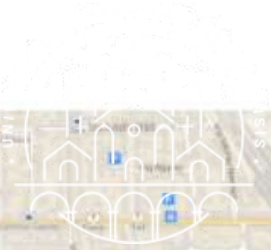


The innovation network for all things blockchain and travel.

Since 2017 Winding Tree has been building decentralized, peer-to-peer and open-source solutions for the travel industry.

 [Read More](#)

Swiss company **Winding Tree** created a decentralized trip reservation platform, lowering costs up to 20%



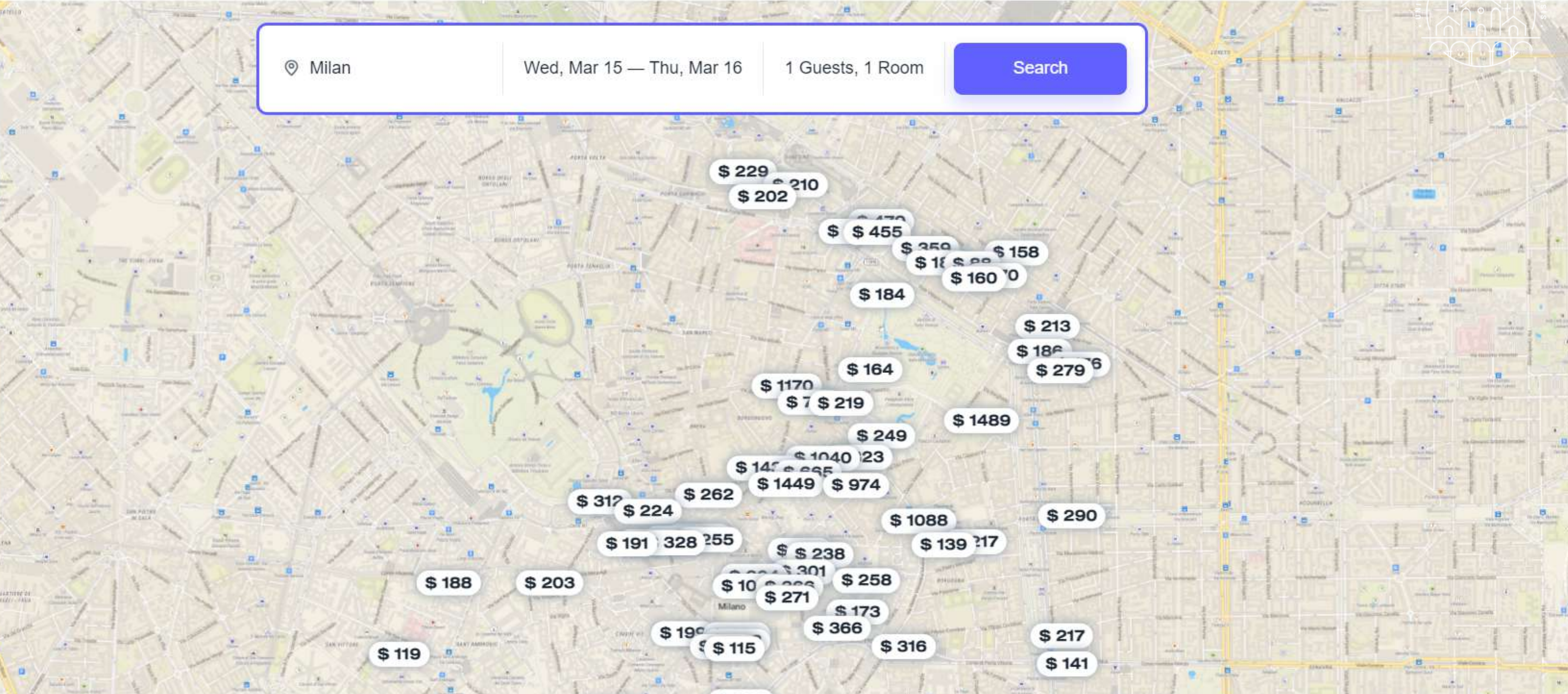
Milan | Wed, Mar 15 — Thu, Mar 16 | 1 Guests, 1 Room | Search



OD Sweet Duomo ... ★ 4
ANGOLO VIA MAZZINI 2, MILAN, IT
From \$497.06/night | \$497.06 total



Maison Milano UN... ★ 4
4 VIA GIUSEPPE MAZZINI, MILAN, IT
From \$282.27/night | \$282.27 total



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Standard double. modern. wi-fi. lcd tv

EUR 113.40

Book your Standard double. modern. wi-fi. lcd tv for 2 adults

Price for 1 nights, 1 room(s)

Standard double. modern. wi-fi. lcd tv

Free cancellation until Fri, Nov 25, 2022. 

[Book Now](#)

Standard twin. modern. wi-fi. lcd tv

EUR 113.40

Book your Standard twin. modern. wi-fi. lcd tv for 1 adult

Price for 1 nights, 1 room(s)

Standard twin. modern. wi-fi. lcd tv

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[Book Now](#)

The graphical interface is **very simple** compared to other online marketplaces like Booking.com or Airbnb, but it works and you can also pay in Bitcoins




Medical records, identity cards, passports, driving licences, birth certificates too may be saved in a blockchain



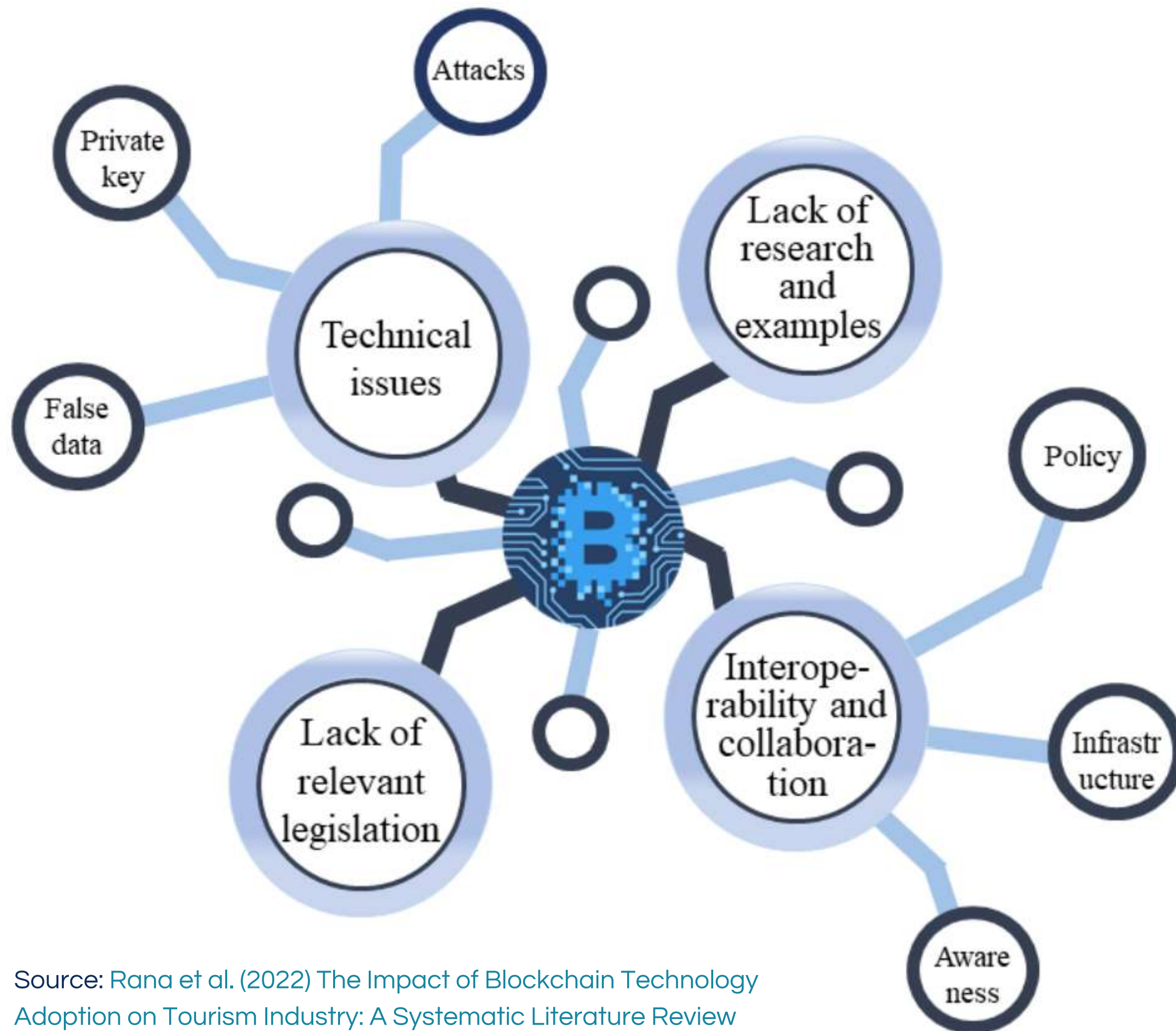
There are also a few **drawbacks**: Blockchain data is **slower to modify** than traditional databases. **Bitcoin** can only do **5 transactions per second**, while **VISA** circuit can do **1700**



If a user loses its **private key** to access a blockchain, there is no central entity that can give back his/her access back: the access is **lost forever**

A yellow pencil with a pink eraser tip is shown pointing towards the bottom right. The background is a light blue gradient with a pattern of binary code (0s and 1s) in a darker blue color.

Blockchain data is very difficult to modify once a block is created, so it is **hard to correct a mistake** or make any necessary adjustments

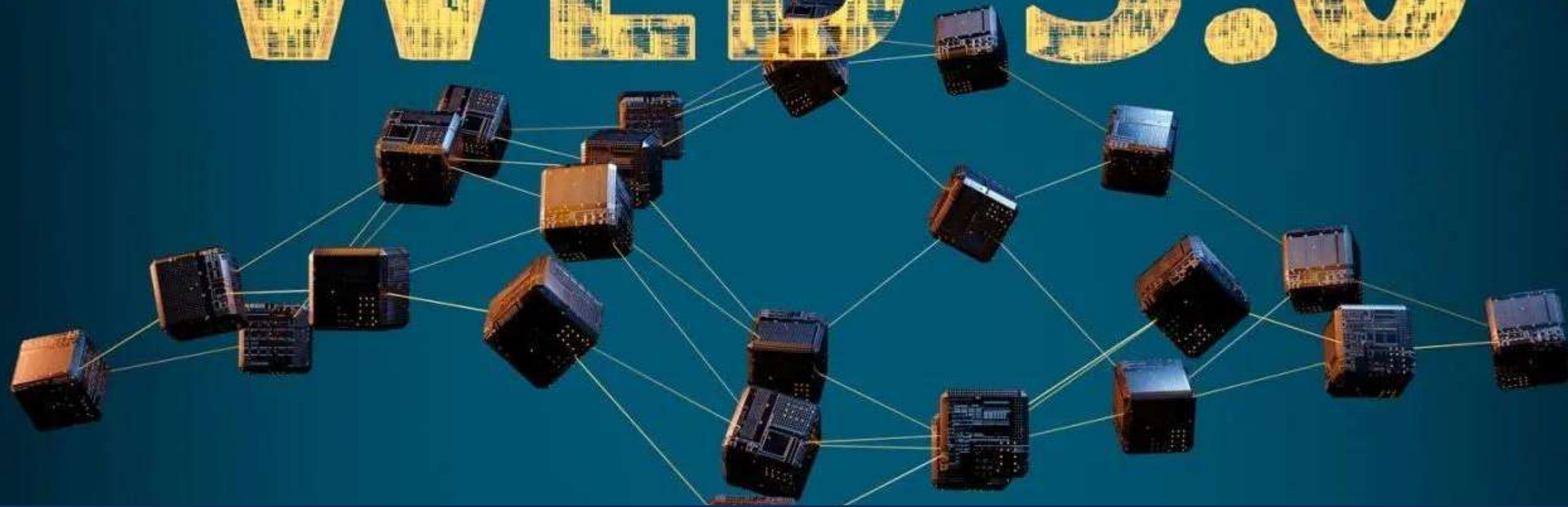


In case of the **tourism industry**, there are also some other **challenges** to implement blockchain

In summary, blockchain may revolutionize all sectors where data are shared, de-centralizing them and making them fully transparent and almost without commissions

Its widespread adoptions will not be limited by the technology but by the **resistance** of the multinationals and institutions in adopting it

WEB 3.0



Web 3.0 is the next evolution of the Web, and it is based on blockchain

2015-present

1991-2014



Web 3

No Intermediaries,
Decentralized



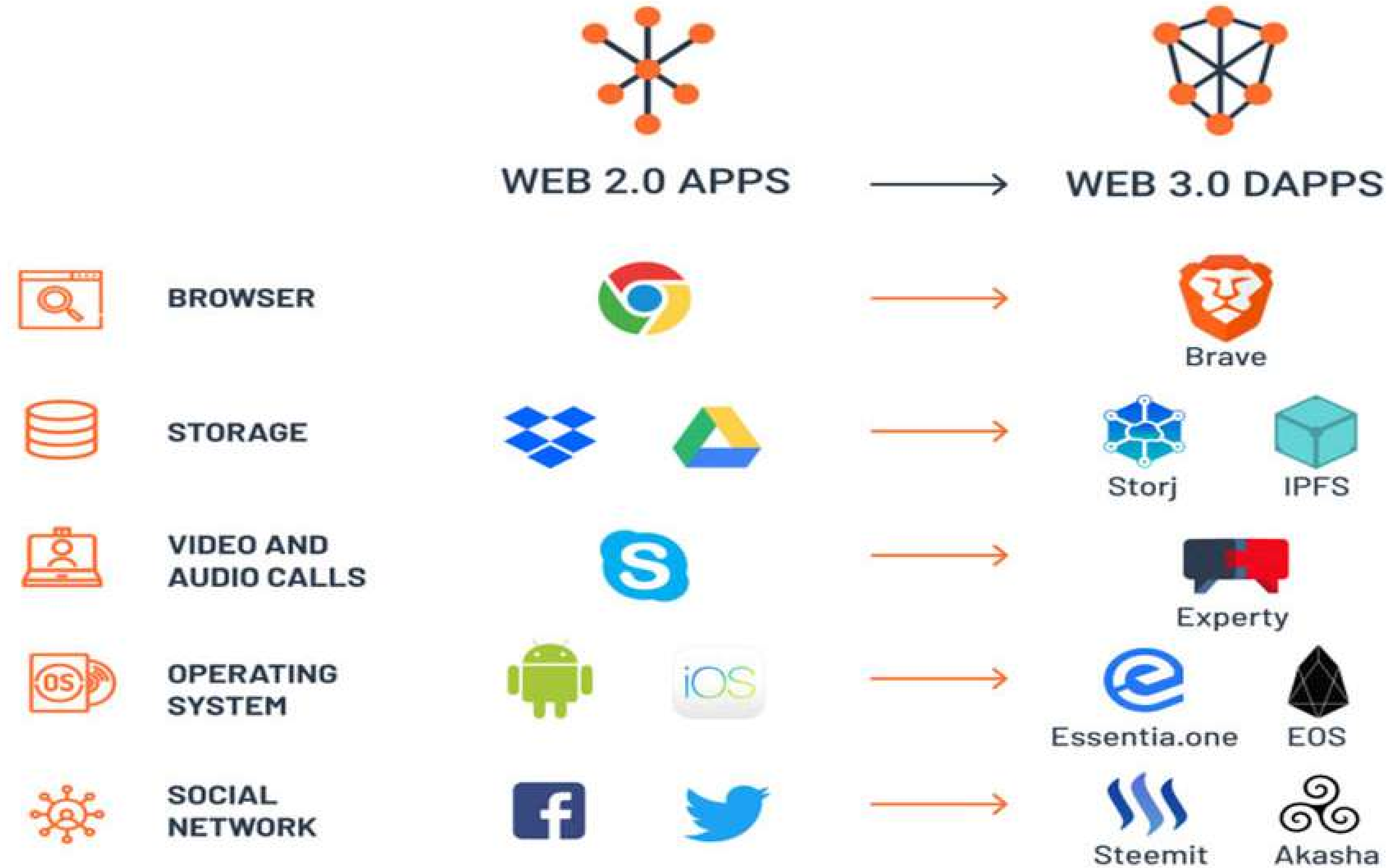
Web 2.0

Participatory,
Centralized



Web 1.0

"Read Only",
Decentralized



There will be a **blockchain equivalent** of each app and service we employ today: "Dapps" (decentralized apps)

DAO Operating Systems

ARAGON DaoStack DaoHaus
COLONY Syndicate Orca CW

Investment DAOs

MetaCartel theLAO Flamingo
Komorebi UdacityFund BitDAO
Free Company Duck DAO

Grants DAO

MetaCartel Ventures MolochDAO
Audius Grants Uniswap Grants
Mint Fund Sevens Foundation
Compound Grants Aave Grants

Protocol DAOs

MAKER Compound UNISWAP AAVE Yearn Sushi
SYNTHETIX Curve Index Coop PieDAO tornado GITCOIN
LIDO pool KeeperDAO Badger RaribleDAO Olympus
hDAO Rari Capital Balancer Cream Finance AUDIUS
Universe inverse finance Aavegotchi INSTADAPP OceanDAO

Service DAOs

RAIP GUILD DXdao PartyDAO
MetaFactory Fire Eyes DeepDAO
Reverie NeptuneDAO Llama
MetaverseDAO LexDAO dOrg
DaoHaus VitaDAO ShinyDAO
OPOLIS DoinGud DEEP WORK YGG

Social DAOs

FWB s/c Seed Club
Radicle FiatLuxDAO
Metafam KrausHaus
ProsperDAO Bright Moments
Meta Gamma Delta
SongCamp CabinDAO

Each Dapp is managed not by intermediaries but by
Decentralized Autonomous Organization (DAO)

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Social DAOs

FWB s/c Seed Club
Radicle FiatLuxDAO

DAOs are platforms that are co-owned and governed by the stakeholders that use them. They may include you too. DAOs don't have a commercial interest and all of what they build is open-source.

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Radicle FiatLuxDAO
Metafam KrausHaus

Third parties who need personal data of the users won't pay intermediaries like Meta anymore: they will pay the stakeholders of the DAOs instead. Thus, you will earn bitcoins by installing and using dapps



web 1.0

web 2.0

web 3.0

98% of the profits of Meta comes from **selling user's personal data** to third parties which exploit this info



web 1.0

web 2.0

web 3.0

"If you are not paying for the product, then you are the product"



Security is a big issue: a successful hacker attack to Google or Dropbox servers in Nevada might destroy all data of billions of users because data is stored only there



web 1.0



web 2.0




web 3.0

That's why the next version of the web will be decentralized



Will the 5 Big Tech companies like Google, Meta, Apple, Microsoft, Amazon and the like give way to DAOs?

A collection of white paper airplanes scattered on a blue background. One yellow paper airplane is positioned on the right, with a dashed white line trailing behind it, suggesting a path or trajectory.

Someone think that this paradigm shift is **impossible**, others that it is **inevitable**, as users will choose DAOs when they will be able to **monetize** their personal data

web 2.0

web 3.0



We'll probably assist to the **co-existence** of Web 2.0 and Web 3.0, without a clear winner.

REFERENCES

In the Moodle there are three articles on Blockchain:

- Nakamoto (2008): Bitcoin: a peer-to-peer Network Cash System
- Rana et al. (2022): The Impact of Blockchain Technology Adoption on Tourism Industry: A Systematic Literature Review
- Balasubramanian et al. (2022): An enabling Framework for Blockchain in Tourism