



# Blockchain solutions for postpandemic society

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  - Digital transformation needs
  - The role of blockchain technology
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# Introduction

- Digital transformation of the society
  - ongoing process that impacts the way we communicate, learn, and think
- Covid19 accelerated the transformation process in some areas:
  - remote work, shopping, data sharing, health care, etc.

# Needs

- Needs exacerbated during the pandemic:
  - real-time access to critical information from trusted sources,
  - trusted and secure sharing of data,
  - data provenance,
  - remote interaction between trusted peers,
  - user privacy.

# Needs

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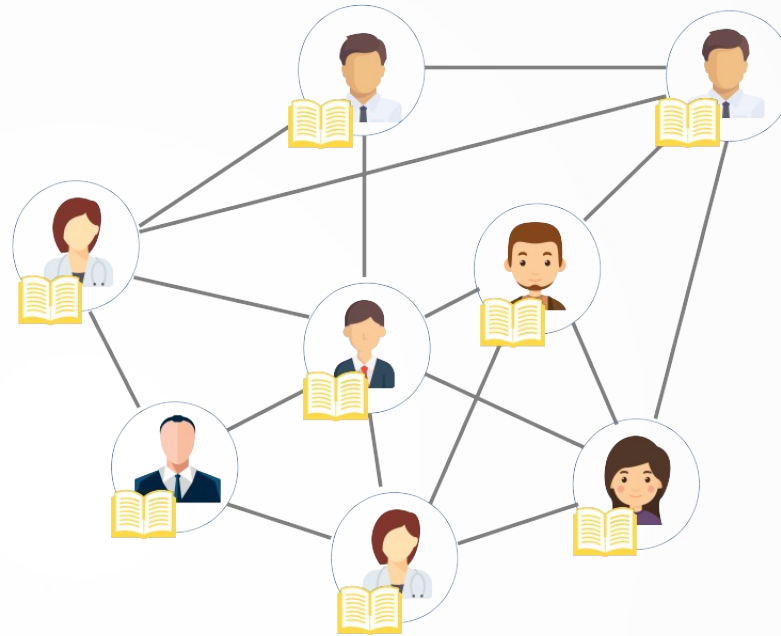
***Traditional solutions have failed!***

# Blockchain

*Blockchain* can provide completely new levels of **security**, **transparency**, **accountability**, **integrity** and **reliability** to systems that generate, maintain and distribute information

# Blockchain

- Distributed ledger



- *P2P network*
- *Ledger replicated in every node*



# Blockchain:

- Distributed ledger
- Permanent record

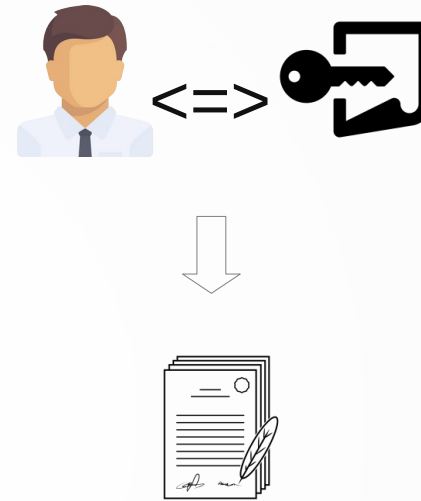


- *Data is aggregated in blocks (→ blockchain)*
- *New data is always appended (cannot be deleted → immutable data)*
- *Impossible to alter a block without invalidating the whole chain*



# Blockchain:

- Distributed ledger
- Permanent record
- Secure and verifiable



- *User signs the data with their encryption keys*
- *Data is timestamped*

# Blockchain properties

*Open and auditable*

*Distributed*

*Immutable*

*Secure*

*Programmable*

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**Transparency**

***Accountability***

# Blockchain properties

*Open and auditable*

*Distributed*

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*Secure*

*Programmable*



**Transparency**  
**Accountability**

**TRUST !**

~~MIDDLE MAN~~

~~Central authority~~

*(Cultural paradigm shift !)*

# Blockchain properties

- Blockchain enables *transfer of value* attached to *digital information*
  - We record transactions on the blockchain
  - We all see the same ledger (we agree on the contents of the ledger, this is called ***distributed consensus***)

*„Internet of Value”*

*digital goods*

*tokens*

*„Internet of Money”*

*cryptocurrency*

# Blockchain

*Blockchain* can provide completely new levels of **security**, **transparency**, **accountability**, **integrity** and **reliability** to systems that generate, maintain and distribute information

It is real, concrete and it works

# Examples

Health care



# Blockchain in health care

- Security and availability of medical records
  - Medical records storage
    - reducing digitization errors of medical records
    - data provenance
  - Doctor-patient confidentiality
- Rapid dissemination of information
  - Trust in the information

A screenshot of a "Report coronavirus cases" table. The table shows data for various countries, including USA, India, Brazil, Russia, Spain, and Argentina. The columns include "Country/Other", "Total Cases", "New Cases", "Total Deaths", "New Deaths", "Total Recovered", and "Active Cases". The "New Cases" and "New Deaths" columns are highlighted in red, indicating recent data. The "New Deaths" column shows values like +1,225 for India and +703 for Brazil.

Country/Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases
World	41,462,420	+437,408	1,135,701	+6,853	30,904,290	9,422,429
USA	8,584,819	+63,663	227,409	+1,225	5,602,116	2,755,294
India	7,705,158	+56,000	116,653	+703	6,871,895	716,610
Brazil	5,300,649	+25,832	155,459	+571	4,756,489	388,701
Russia	1,447,335	+15,700	24,952	+317	1,096,560	325,823
Spain	1,046,641	+16,973	34,366	+156	N/A	N/A
Argentina	1,037,325	+18,326	27,519	+419	840,520	169,286

# Blockchain in health care

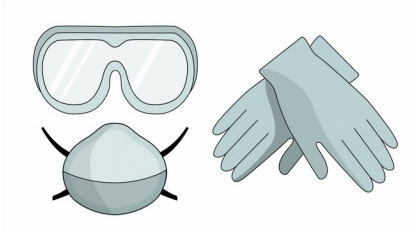
- Data aggregation and sharing for research
  - Researchers need to collect, aggregate and use the data
  - Blockchain-powered platforms enable data ownership, consent management and auditability
    - The shared datasets belong to their original owners

# Blockchain in health care

- Supply Chain Management

- Medical equipment

- Blockchain solutions allow healthcare organizations and medical suppliers to obtain a full picture of inventory in a transparent and trusted manner



- Pharmaceutical products

- Tracking of drugs from pharmacy to patient
    - Monitoring the administration of drugs to patients



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South Korean tourist island tries to stay open and safe with blockchain technology.

*\* News titles taken from Cointelegraph.com Sep - Oct 2020*

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Blockchain-supported decentralization has a chance to improve the difficulties for pharmaceutical and life sciences supply chains.

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## 17M Chinese tourists verify health using blockchain to visit Macau

Interoperability between Macau's blockchain-powered medical data system and mainland Chinese health codes allowed tourism between the jurisdictions to recommence.

## Could these be the COVID-19 winners tackle

A technology company has revealed the winning team of each category receiving a prize.

## Government invests in blockchain health passport

Singapore continues to apply blockchain technology in various areas: A trillion-dollar market is taking the taking

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# Examples

**Education**

# Blockchain in education

- Blockchain in distance learning and online education
  - Issuing degrees and online certifications through blockchain
    - With blockchain they cannot be falsified
    - ECTS
  - Providing incentives to students and educators
    - Rewarding results with tokens
  - Local example:
    - Smart contracts for supporting student projects



# Discussion

- Challenges:
  - Shared governance and leadership (globally)
  - Regulation and bureaucracy
  - Common set of standards
  - Digital transformation fatigue

# Discussion

- Conclusion:
  - Blockchain is the new platform for credentials and trust
  - The old industrial models have to change
    - we must break through the inertia of using old-and-tried, but now increasingly inadequate systems
  - Covid19 crisis is prone to accelerate the pace of historical change

Thank you !

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