

A thick black L-shaped frame surrounds the text. The top-left corner is a horizontal bar extending to the right, then a vertical bar extending downwards. The bottom-right corner is a horizontal bar extending to the right, then a vertical bar extending upwards.

TEASER: COMBINING EMREX AND BLOCKCHAIN

Mirko Stanić

What is blockchain?

- it's not Bitcoin
- distributed ledger
 - *immutable (no changes)*
 - *sequential (events are recorded as they happen)*
 - *distributed (no single access point)*
- enables implementation of smart contracts

What is a smart contract?

- computer protocol intended to facilitate, verify, or enforce the negotiation or performance of a contract
- program committed to the blockchain
 - *cannot be altered*
 - *executes automatically when conditions are met*

What types of blockchain are there?

- Permissionless (trust-free)
 - *Bitcoin, Ethereum, Litecoin, Dash*
 - *open read/write*
 - *consensus is reached by racing to solve crypto problem*
- Permissioned (trusted)
 - *R3, Energy Web Foundation, B3i*
 - *permissioned read/write or open read/permissioned write*
 - *consensus is reached by pre-selected nodes*

Uses for blockchain in education?

- issuing education certificates for students and accreditation certificates for institutions
- student identification within educational organizations
- registering recognition of prior learning (RPL)
- tracking intellectual property or citations in research papers

Where does EMREX come in?

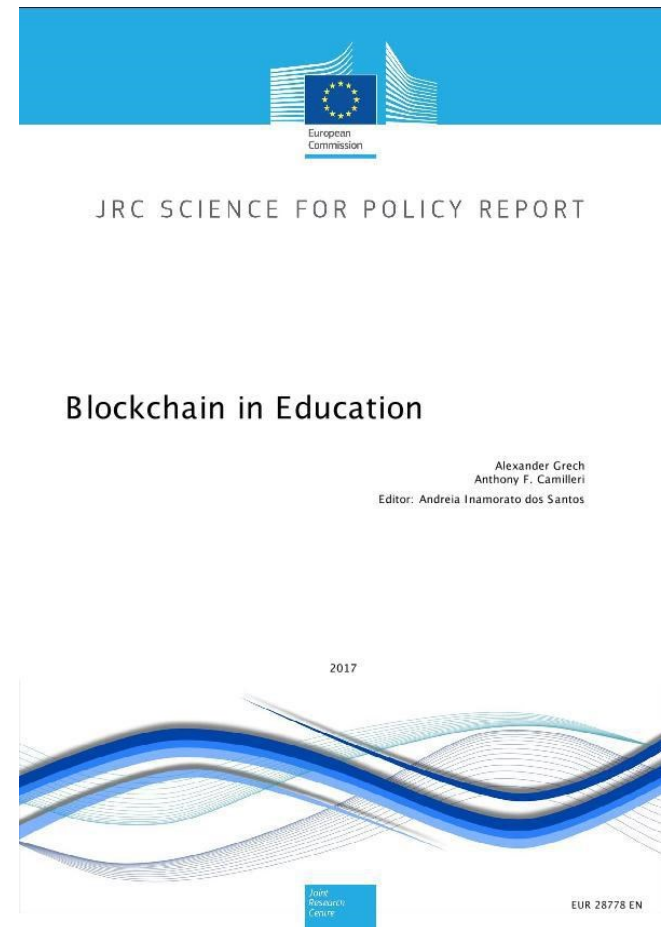
- format for issuing education certificates for students
 - *spreading ELMO user and service base*
 - *proliferation of EMREX brand*
- implementation of EMREG directly on the blockchain through smart contracts
 - *no need for a central repository of public keys*
 - *no central key repository that can be compromised*

Blockchain in Education

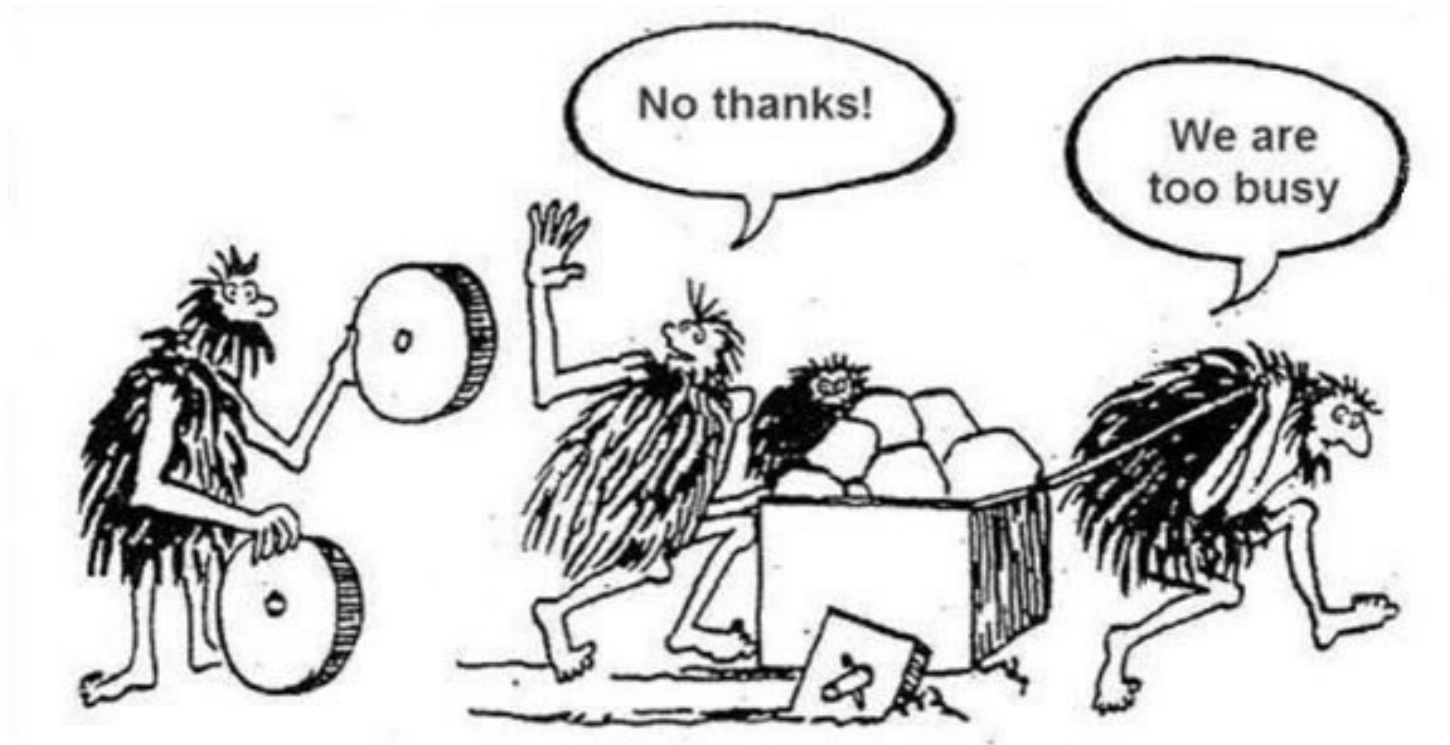
JRC report

- Europe should urgently consider supporting the creation of digital meta-data standards for educational records.
- Standards need to be developed for identification of students, recording student accomplishment in formal and non-formal settings at different levels of education.

<https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/blockchain-education>



Why bother with all that?



How the Internet came to be? No, not the World Wide Web.

- TELEPHONE circuit switching
 - *dedicates a fixed channel for communication*
- ARPANET (1969) packet switching
 - *split data into packets and send it through various channels*
- Businesses want this new technology but don't want to change their business models - „virtual circuits”

How the Internet came to be? No, not the World Wide Web.

- European telecoms
 - *Open Systems Interconnection*
- IBM
 - *Systems Network Architecture*
- Digital Equipment Corporation
 - *DECnet*
- Internet community
 - *TCP/IP*

30 years later

BLOCKCHAIN

How the ~~Internet~~ came to be?
No, not the World Wide Web.

INTERNET

- ~~TELEPHONE~~ circuit switching
 - ~~dedicates a fixed channel for communication~~

BLOCKCHAIN

- ~~ARPANET (1969)~~ packet switching
 - ~~split data into packets and send it through various channels~~
- Businesses want this new technology but don't want to change their business models - „virtual circuits”

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