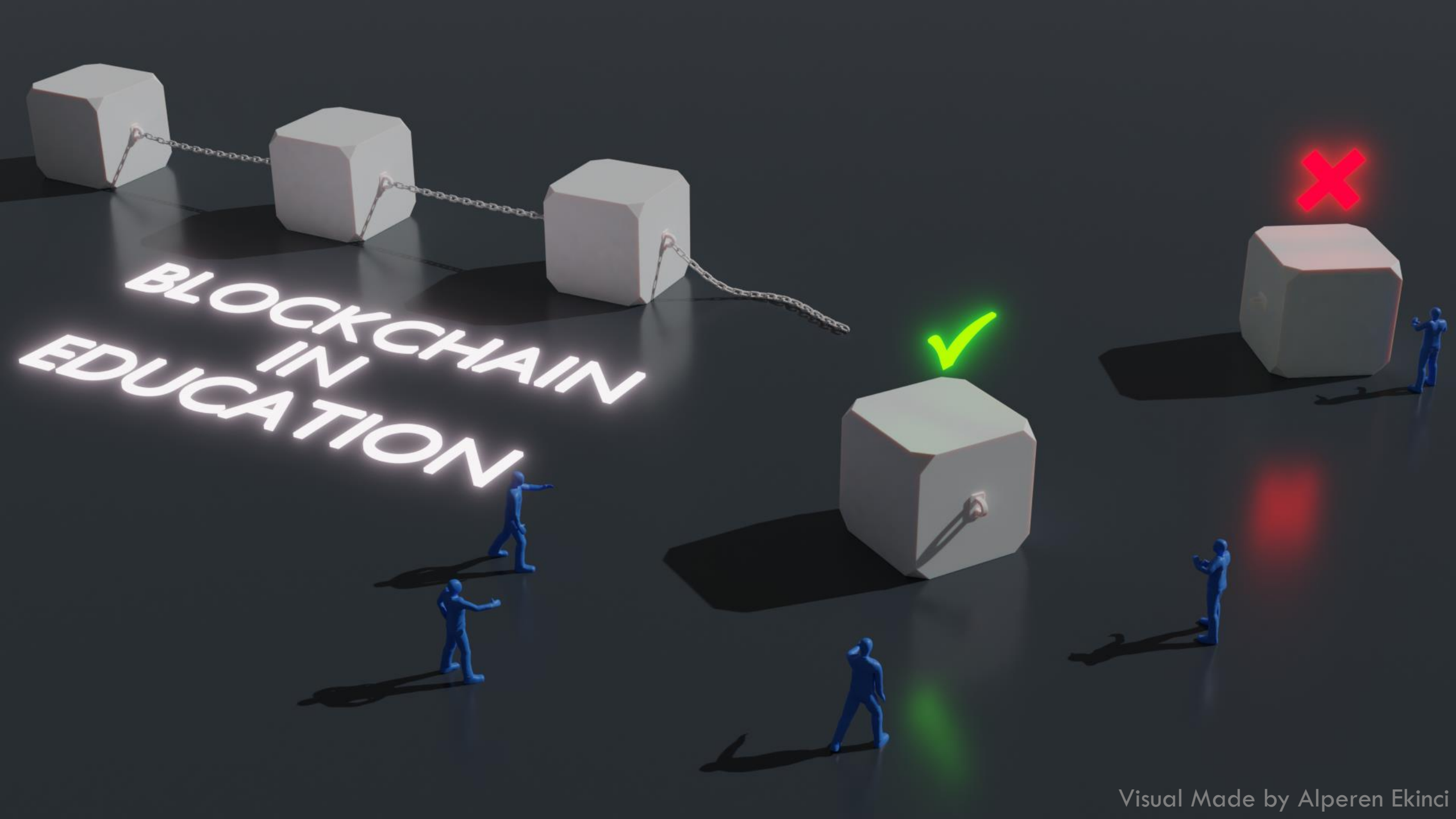
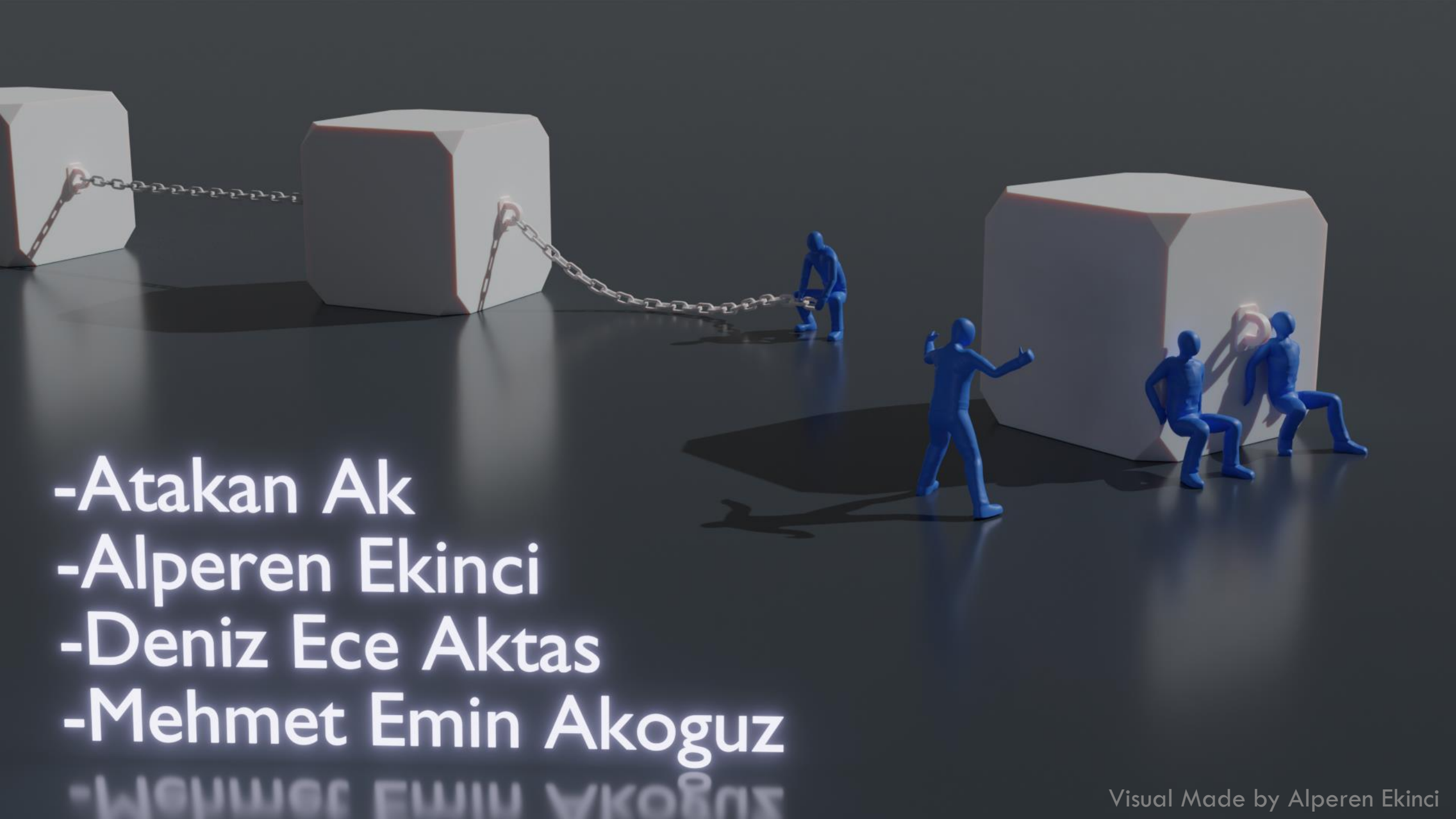

BLOCKCHAIN
IN
EDUCATION
Visual Made by Alperen Ekinci

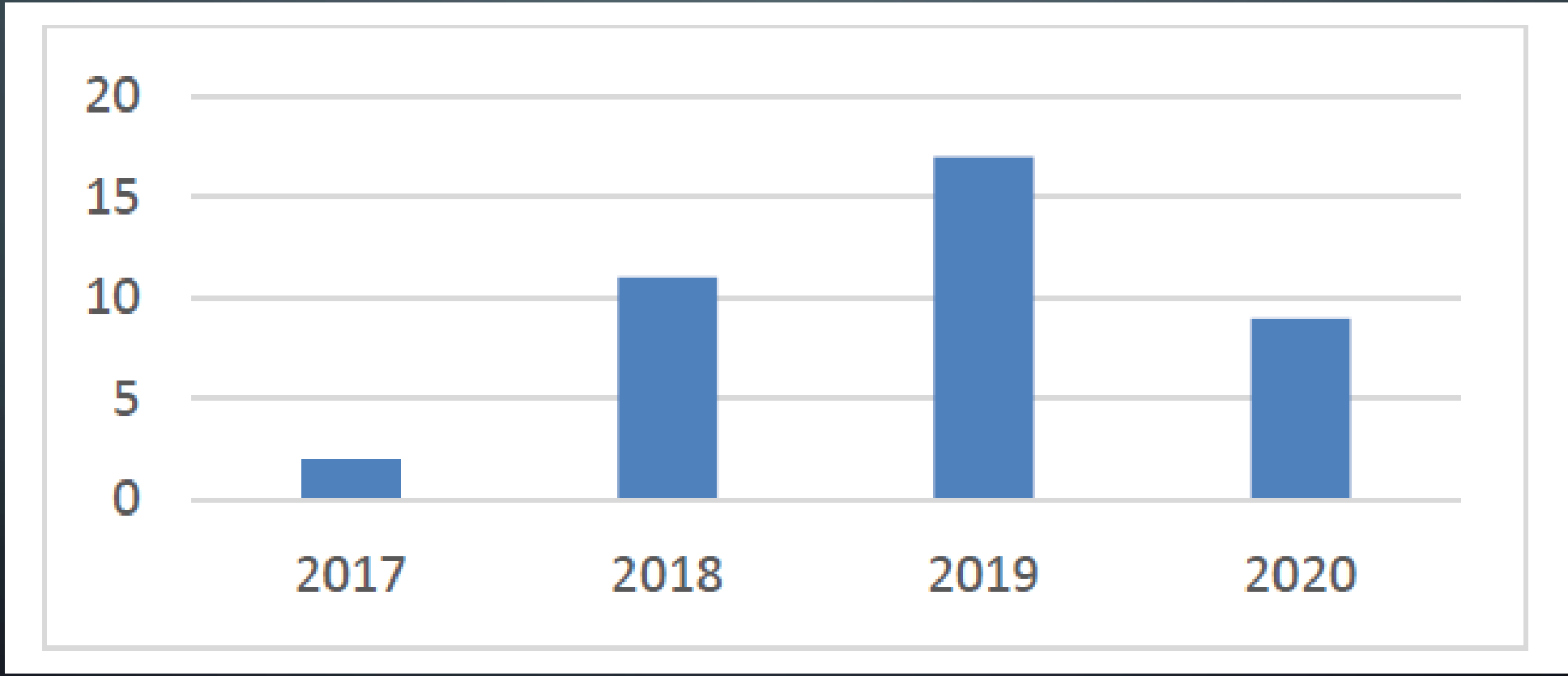

-Atakan Ak
-Alperen Ekinci
-Deniz Ece Aktas
-Mehmet Emin Akoguz
Visual Made by Alperen Ekinci

INTRODUCTION

We;

- decided on a research for the educational purposes of Blockchain.
- analyzed varying papers on the topic.
- want to discuss about the observations we gathered from analyzing these papers.
- found a limited number of fields that the papers consider currently viable for Blockchain use.
- In this presentation we will talk about them and their potential, their shortcomings and our improvements on them.

STATE OF THE ART



Number of Papers per year

- Blockchain in education has gained popularity in recent years.
- Many projects have been proposed but few have been implemented.
- Blockchain has been applied in many areas however education is not seen as a priority.

MAIN RESEARCH AREAS

- Certificate/ Degree Verification
- Student Assessment
- Credit Transfer
- Data Management
- Admission
- Review Papers
- Copyrights Management

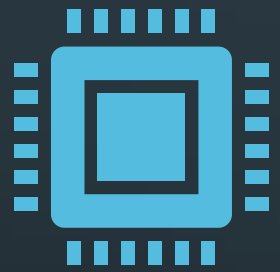
Initially designed by MIT Media Lab and by Learning Machine, now Hyland Credidentials it is an open standart for creating, issuing, viewing, and verifying blockchain-based certificates.

These digital records are registered on a blockchain, cryptographically signed, tamper-proof, and shareable.

NESPOR

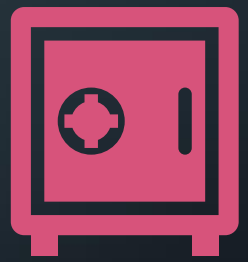
- Nespor is one of the proposed blockchain platforms.
- Nespor gives authorization to higher level academics and lets them provide students with official certificates that they can share after their academic years with their employers.
- This helps with the legitimacy of the documents and also makes requesting official documents easier.

SONY GLOBAL EDUCATION



In 2019 with the initiation of Sony Global Education, Fujitsu Limited, and Fujitsu Research Institute, a field trial for blockchain was started.

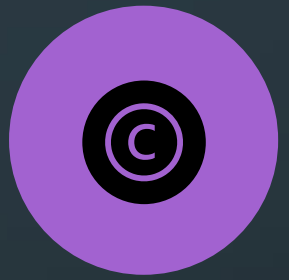
Purpose of this field trial is to assess the versatility of blockchain in records of courses and student evaluation data.



Side note: Just like Nespor the credits are stored and shared securely. But with SGE blockchain to confirm a document is real it is necessary to submit the original transcript .

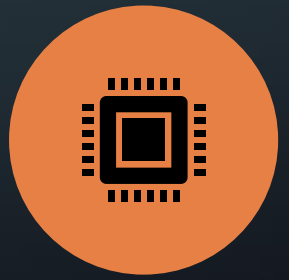
CHILO

CHiLO is a system that is discussed but not yet implemented.



Copyrights management is an important part of education where the ownership rights of a product is reserved with blockchain.

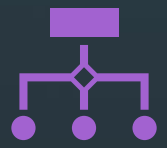
It is used for protecting especially e-books ownership rights and copyrights.



There is a need for this kinds of systems because of the internet there are a lot of resources that are stolen or anonymous.

EDUCTX

EduCTX system is one of the credits transfer blockchain technologies that uses tokens to efficiently transfer credits.



EduCTX address of each institute is unique to each one of them. The most important benefits of this system are provability of the documents, scalability because there are unlimited number of institutes that can join the network.

Also it makes less paperwork and makes application, verification and request processes much more easier and faster.

LIMITATIONS

The public blockchain may be ideally suited for currency, but when it is applied to other areas, its benefits are offset by several limitations.

One problem is the high cost of ensuring consensus when large records are accepted into the public ledger.

If a record is admitted to a public blockchain it is guaranteed to be immutable but it may have no value or quality.

IT'S NOT FREE

- Bitcoin's blockchain has been almost free to users but it has not been free to miners.
- They pay a high computational price to validate new blocks.
- A group of miners should be willing to spend almost a bitcoin of processing energy to mine a bitcoin.
- Potential users will get onboard with the public blockchain only if it provides positive value after fees are subtracted.
- Users who put high-value financial assets will be willing to pay escalating fees but others who have less significant assets such as **diploma records** are unlikely to accept that bitcoin's public blockchain is a cost-effective infrastructure.

FUTURE OF BLOCKCHAIN

The ease of access and usability of Blockhain may cause an abundance of educational products though in absence of regulation it may not be as efficient as the 'classic' methods.

The transition to blockchain does not mean the absence of quality-control regulations in the future.

However it is not yet clear how it will work with the centralized authority.

Linked list format of public blockchain will cause a problem in the future, it will eventually grow to an unmanageable size.

Blockchain records being guaranteed immutable. If the linked list data format is used there is no guarantee for it to be immutable.

To cope with this, oracles are suggested to be used.

OUR TAKE

During course enrollment week the servers represented as a burning potato.

- What is the problem?
- As many of you know our schools course enrollment system has a tendency to completely implode on itself and when it works it doesn't let the students reserve the courses they choose until you finalize your decision.
- This causes a cycle that consists of students requesting quota increase from teachers, other courses filling up in the mean time and then again students requesting quota increase...
- This cycle will continue for days.

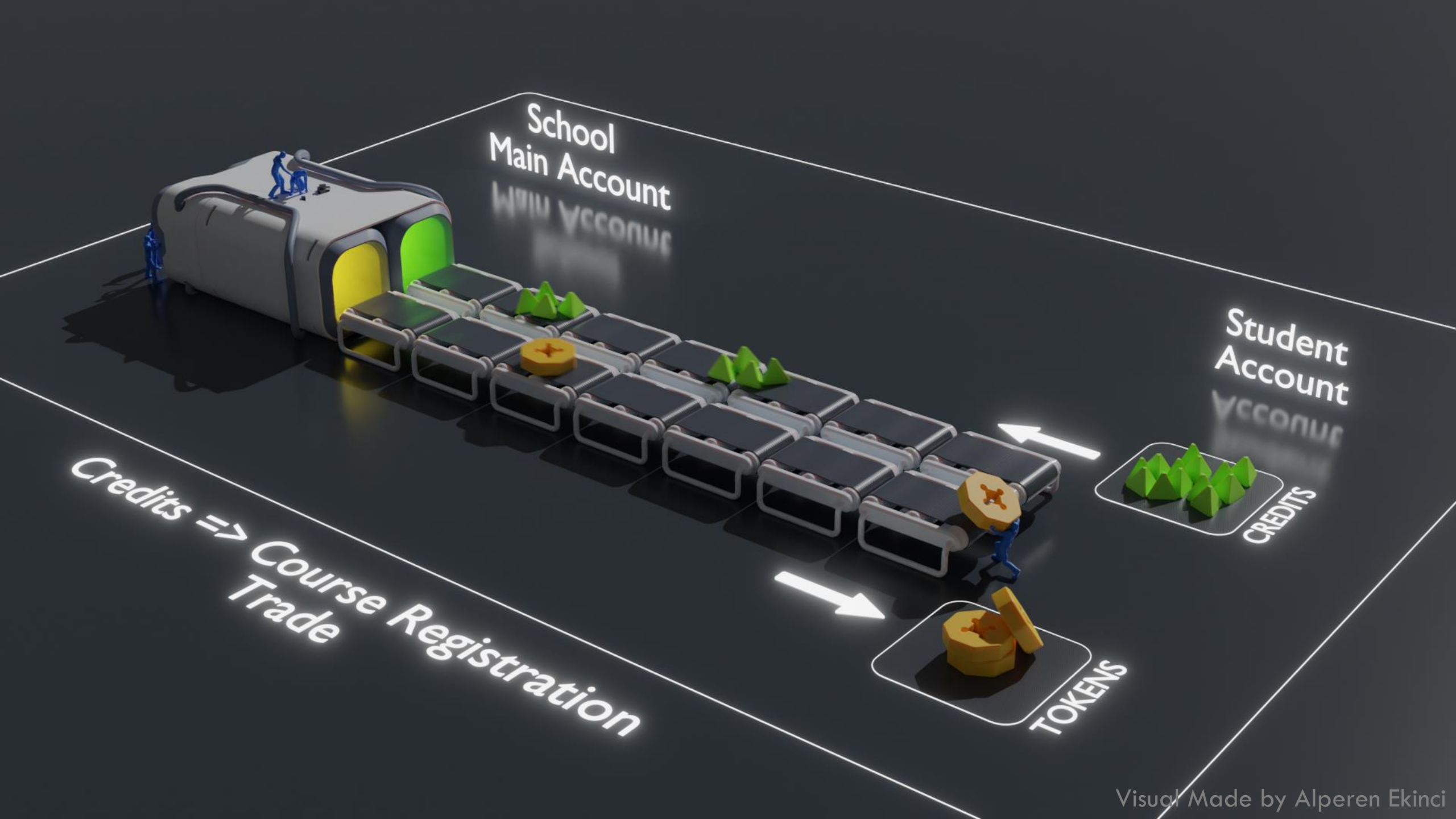
Visual Made by Alperen Ekinci

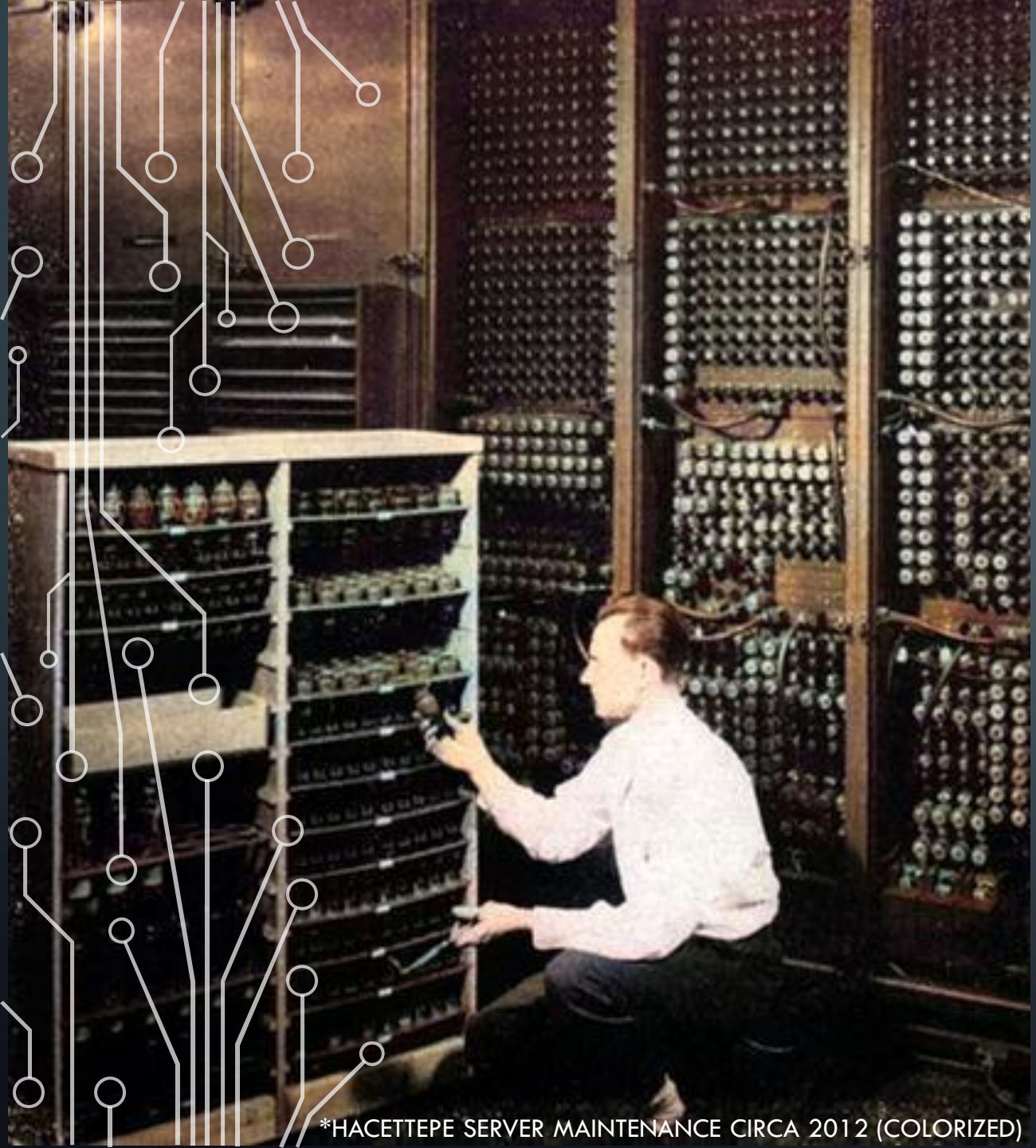
OUR PROPOSAL

Our proposal is a system of tokenization of classes, each class will be a unique token, and trading credits for those specific tokens.

Basically, students will have their personal accounts in which they can access with their secret keys and the school will have a main account. In the main account, the credits and the class tokens will be traded.

After the enrollment week, the school will backtrace the blockchain and create the data in a normative way.


School
Main Account
Student
Account
CREDITS
TOKENS
Credits => Course Registration
Trade
Visual Made by Alperen Ekinci



*HACETTEPE SERVER MAINTENANCE CIRCA 2012 (COLORIZED)

- For each term, the process will be repeated thus the chain will not be prolonged unnecessarily.
- A big issue that us, students, have been dealing with is that a lot of students will register into a class and then sell the said class to another student with money.
- The problem will be eliminated by letting all students have possession of a copy of the blockchain and since school backtraces the blockchain any altercations will be detected.

TOKENIZATION

Tokenization is the action of creating a blockchain token that digitally represents a tradeable asset.

The school will hold all the tokens as class quotas and will give a token to everyone who requests it until no more tokens remain of that class.

BENEFITS OF TOKENIZATION

An economy with tokens decreases the friction involved in the buying, selling and creation of securities.

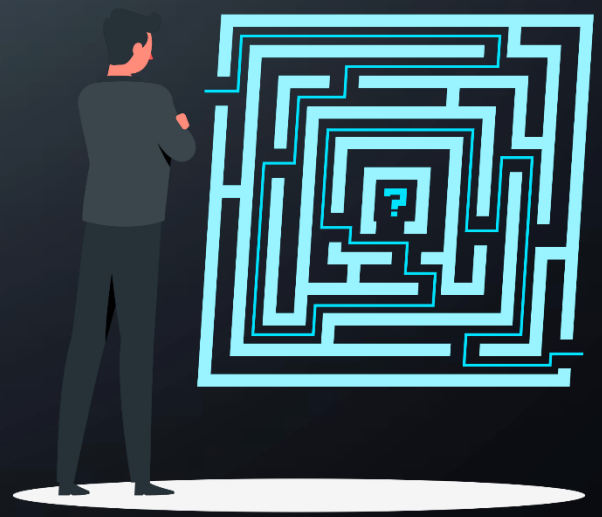
This increases fairness and transaction speed.

Since smart contracts are used in this exchange, certain parts are automated.

Lower transaction fees

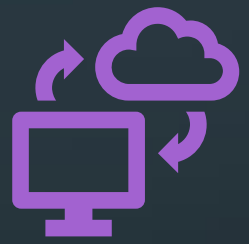
CHALLENGES

- The existence of security tokens needs guidance from the regulators.
- It is risky to not include a legal and safe environment.
- Insufficient analysis on the subject may result in hacking, this will harm and may even cripple the economy.

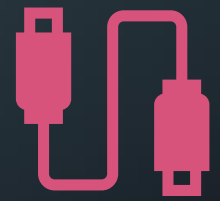


OUR SOLUTION

Our system will allow students to enroll without failures .



The only tradeoff is miniscule amounts of computing power for the school.

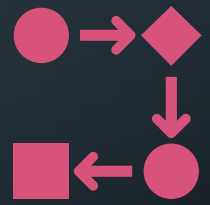


If all goes well the problem we had for years may be solved with the Blockchain technology.

CONCLUSION

Blockchain has not yet been searched enough and ideas in this area generally are not yet used .

Though it is a developing field and may yield great results.



For this to happen, we think it should be tailored(not just including itself) to the specific task it needs to do.

WORK DISTRIBUTION

- Atakan Ak :Paper Research, Writing the Material, Making the Slides
- Alperen Ekinci :Paper Research, Writing the Material, Visuals
- Deniz Ece Aktaş: Paper Research, Writing the Material, Revization
- Mehmet Emin Akoğuz: Paper Research, Writing the Material, Presentation