BPChain
## Benchmarking tool for comparative evaluation of blockchain protocols

BLOCKCHAIN FOR BUSINESS PROCESSES: MAKING THE RIGHT CHOICE

- Blockchain protocols have different characteristics and offer various capabilities for creating blockchain applications.

- Initially serving as basis for public networks, the technology allows building private permissioned networks for businesses.

- To identify the strengths and weaknesses of platforms we chose three technologies , which differentiate in a setup, consensus protocols, and chain configurations.

- The benchmarking tool for the technology comparison should provide a representative environment being easy to update, identify good metrics for evaluation and perform repeatable evaluations under real scenarios.
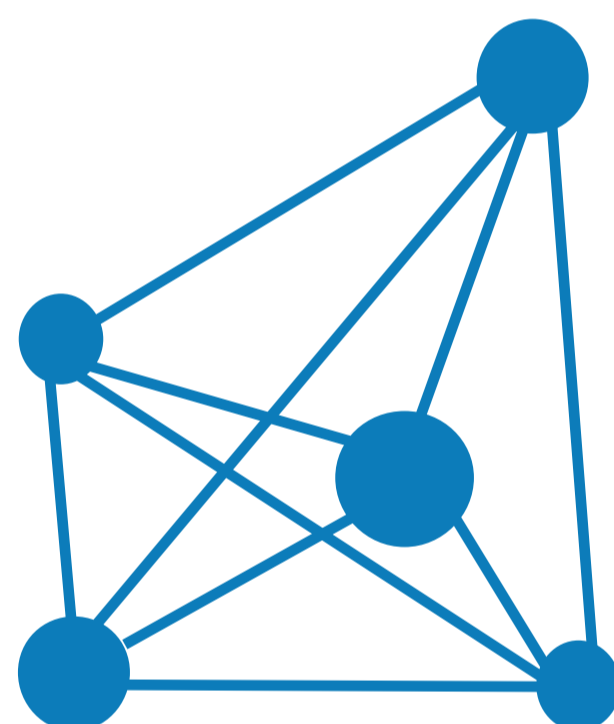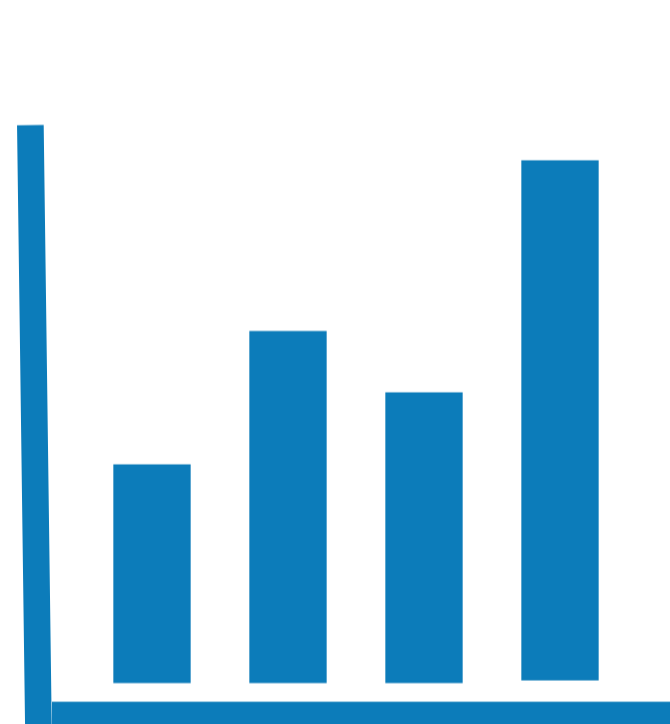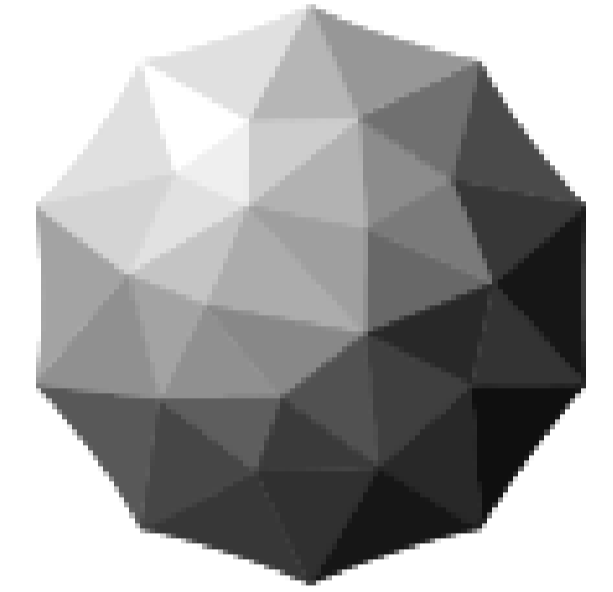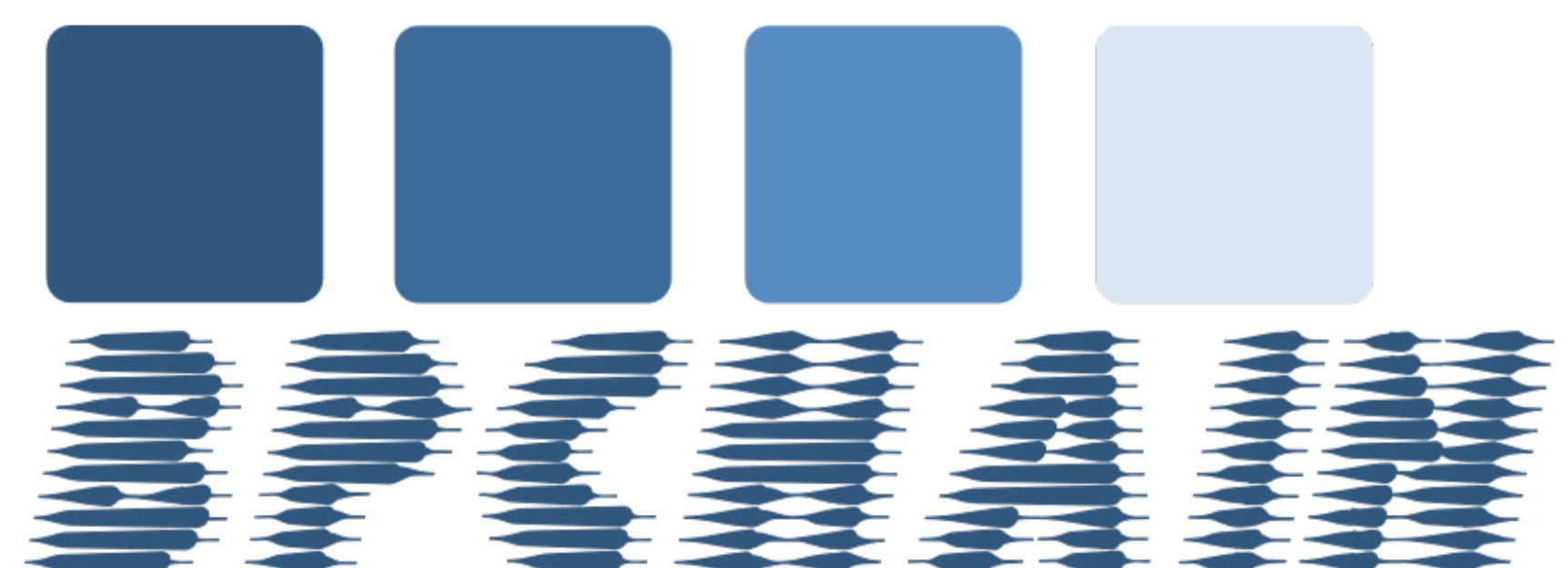
HOW TO ESTIMATE THE PERFORMANCE OF BLOCKCHAINS?

The choice of platform is determined on overall efficiency, scalability, security, and maturity of its blockchain, which can be evaluated through the network parameters.

- Efficiency of blockchains is measured with two criteria: speed and cost of transactions. Blockchains using Proof-of-Work consensus protocol have lower transaction throughput and are usually outperformed by blockchains without need for mining, for example MultiChain.

- Scalability of the blockchain network is its ability to reach consensus when the number of peering nodes are constantly increasing. Again, the network based on
Proof-of-Work is harder to scale: more peers in the network, more transactions to conduct result in longer approval and creation of a block.

- Security of blockchains relies on robustness against external and internal attacks. Securing the network with hard math tasks Ethereum outperforms MultiChain which is based on trusting the majority.

HOW TO TEST BLOCKCHAIN APPLICABILITY FOR A SCENARIO

- EVAPCoin – the modeled scenario to test and compare chosen blockchain technologies. The idea of the use case is simple: each student enrolled in a lecture evaluates it and receives extra coins in return. As a reward, coins can be spent at the HPI events for foods and services.

- Use case was tested on three blockchains running in the FSOC network: Ethereum, MultiChain, XAIN. The defined scenario is deployed as a smart contract on Ethereum and XAIN networks, and configured as asset transfer in MultiChain .

- The scenario was successfully tested on all networks, while demonstrating different performance results. MultiChain and XAIN outperformed Ethereum in both scalability and efficiency. The reasons are rooted in the consensus protocol: Proof-of-Work needs much resources to conduct transactions, which limits its speed . Quite the opposite showed XAIN, which stayed fast and resource friendly even with a big amount of nodes in the network.