Blockchain as a Transaction Protocol for Guaranteed Transfer of Values in Cluster Economic Systems with Digital Twins

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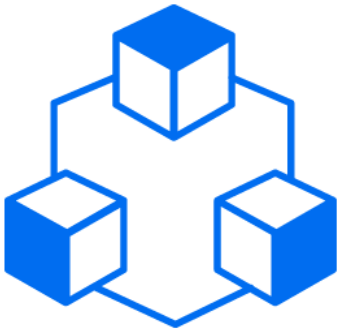
Introduction

- Expertise 482.solutions

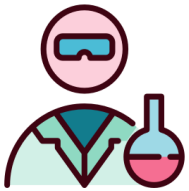


P2P / Distributed [Ledger] Technology

M2M / Internet of Things

Introduction

- R&D, Science & Education



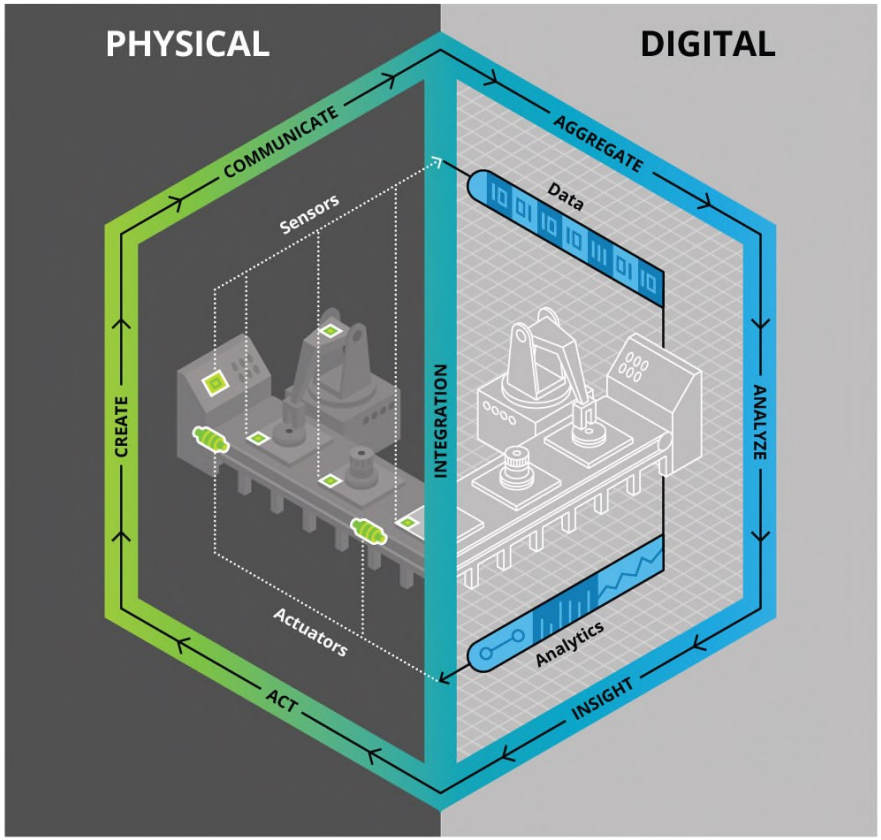
- Digital twins protocols
- Distributed infrastructure
- P2P economic models
- Applied issues of DLT

Odessa I.I.Mechnikov National University

MFA UA

Problem Formulation

- How we can guarantee trust for digital twin?



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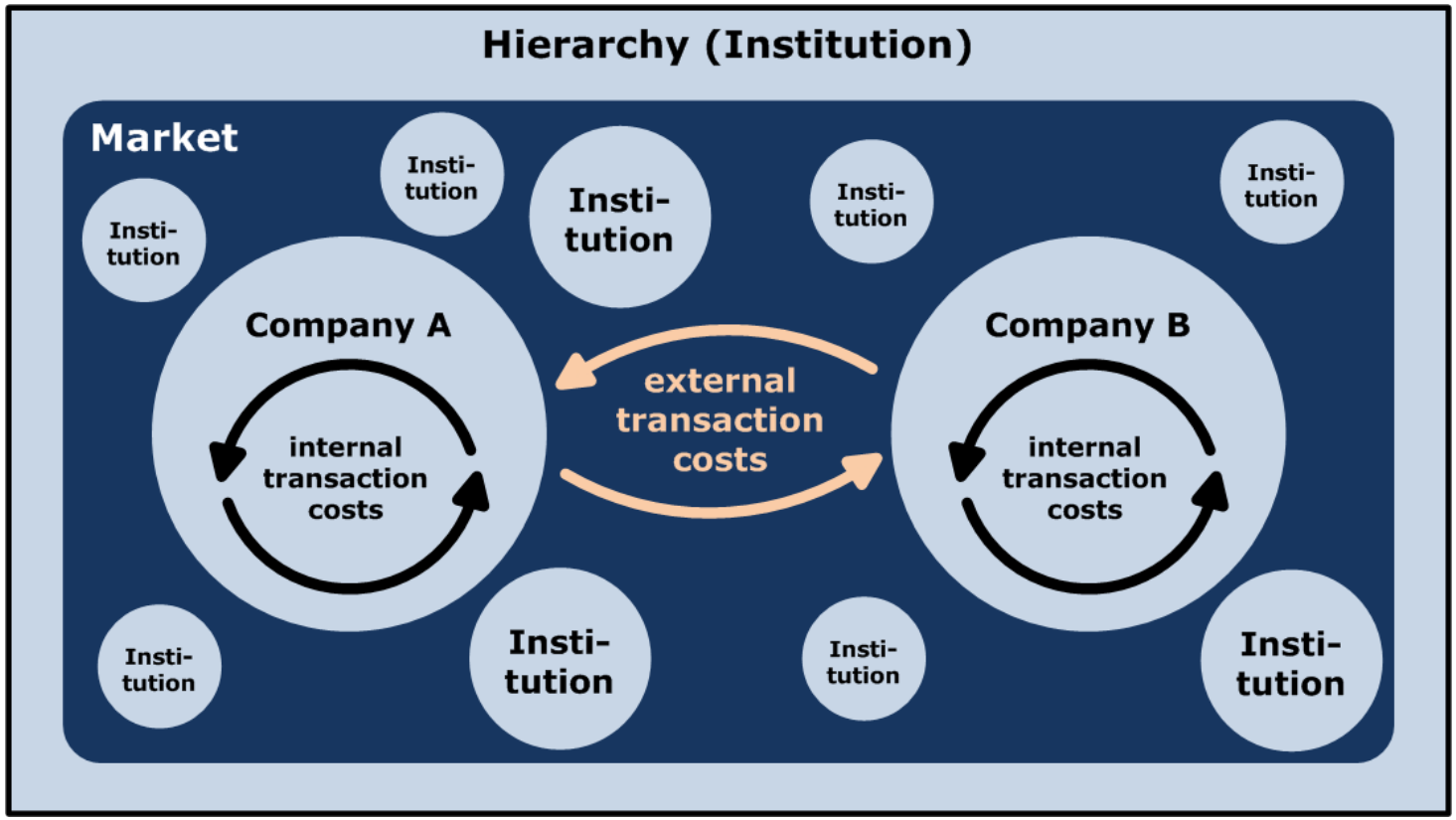
Deloitte University Press | dupress.deloitte.com

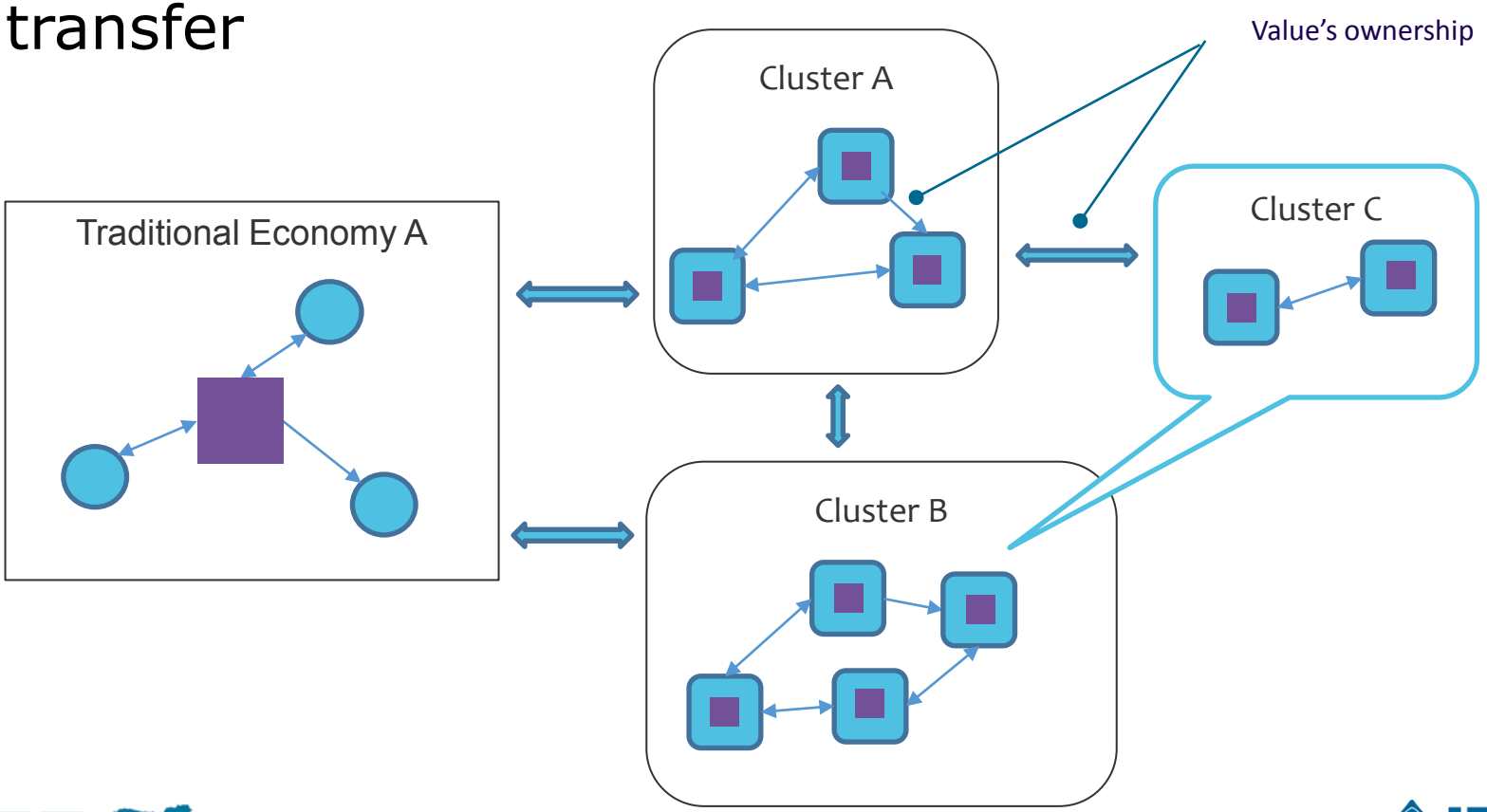
Problem Formulation

- Transaction Cost Theory (Ronald H. Coase)



Problem Formulation

- P2P cluster's economy and value's ownership transfer



Methods

- Mealy machine and Economic Effect

$$\delta: S \times X \rightarrow S \quad (1)$$

$$\lambda: S \times X \rightarrow Y \quad (2)$$

$$M = (S, S_0, X, Y, \delta, \lambda). \quad (3)$$

where S — the set of all possible internal states of the system;
S_0 is the initial state of the system;
X is external impacts on the system;
Y is system outputs (its impact on the environment);
δ is transition function, determining the change in the internal system's state;
λ — output function, which determines the impact on the environment.

Methods

- Blockchain as notary for the digital twins

p2p network

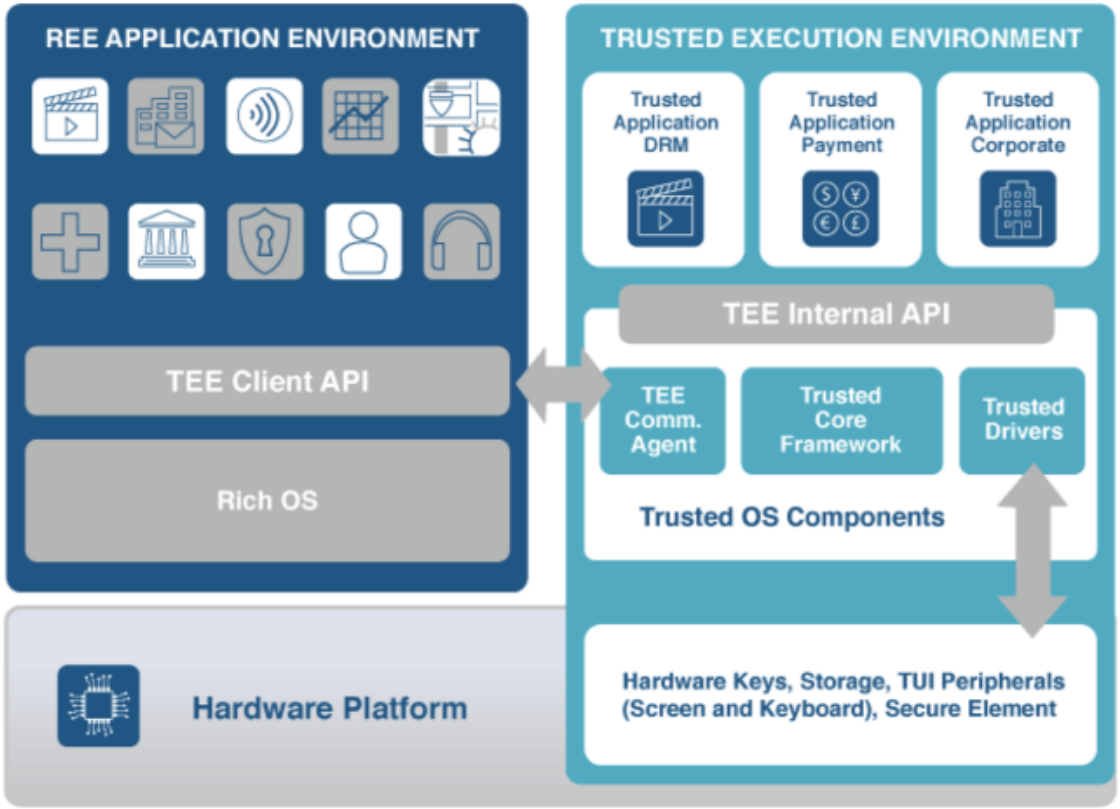
p2p transactions protocol

Consensus-based

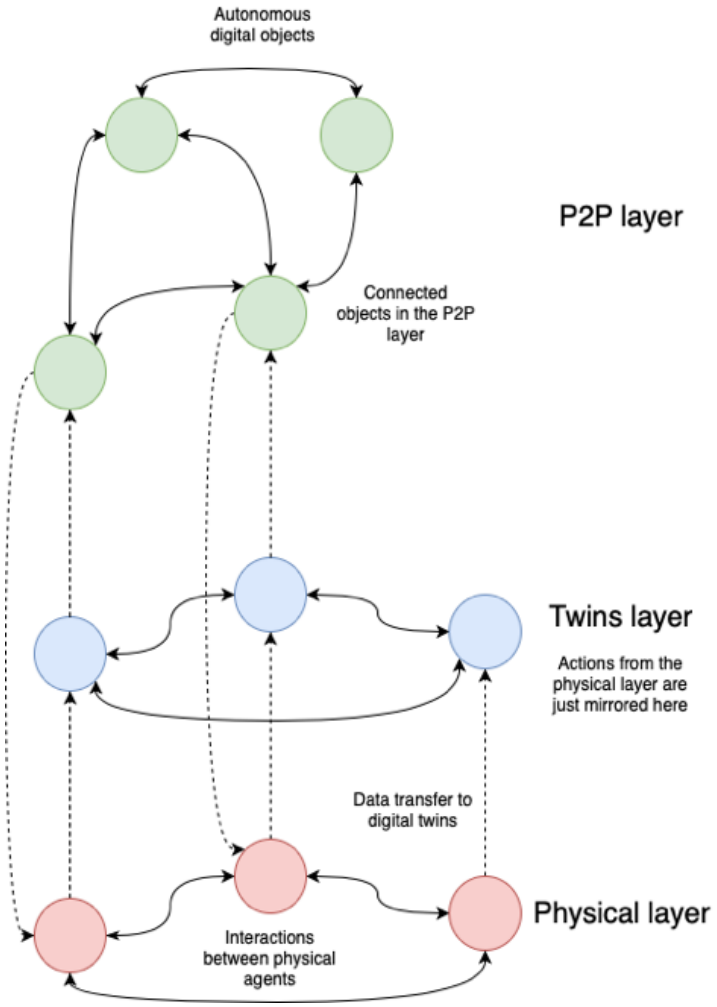
Point of trust

Methods

- Trusted Execution Environment (TEE)

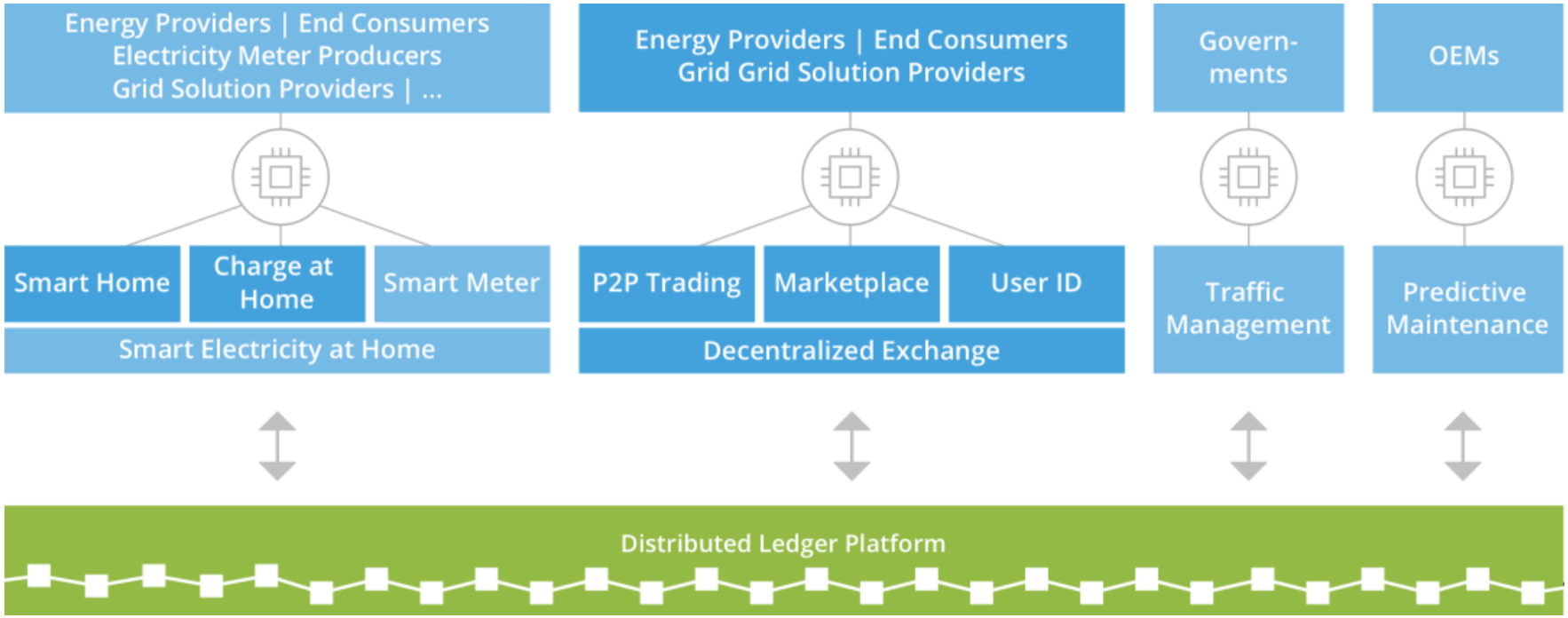


Results: Model of digital twin interaction based on blockchain



Conclusions

- Digital twins of energy smart grids and blockchain



Conclusions

- Blockchain as P2P protocol and infrastructure for distributed electricity market

Energy assets ownership management

Settlement and clearing for energy trading

Economic infrastructure for P2P energy market

P2P ecosystem for E-mobility market

Conclusions

- Digital twin of Odesa city

Thank you!

Thank you for attention !
Děkuji za pozornost !
Dziękuję za uwagę !
Дякую за увагу !