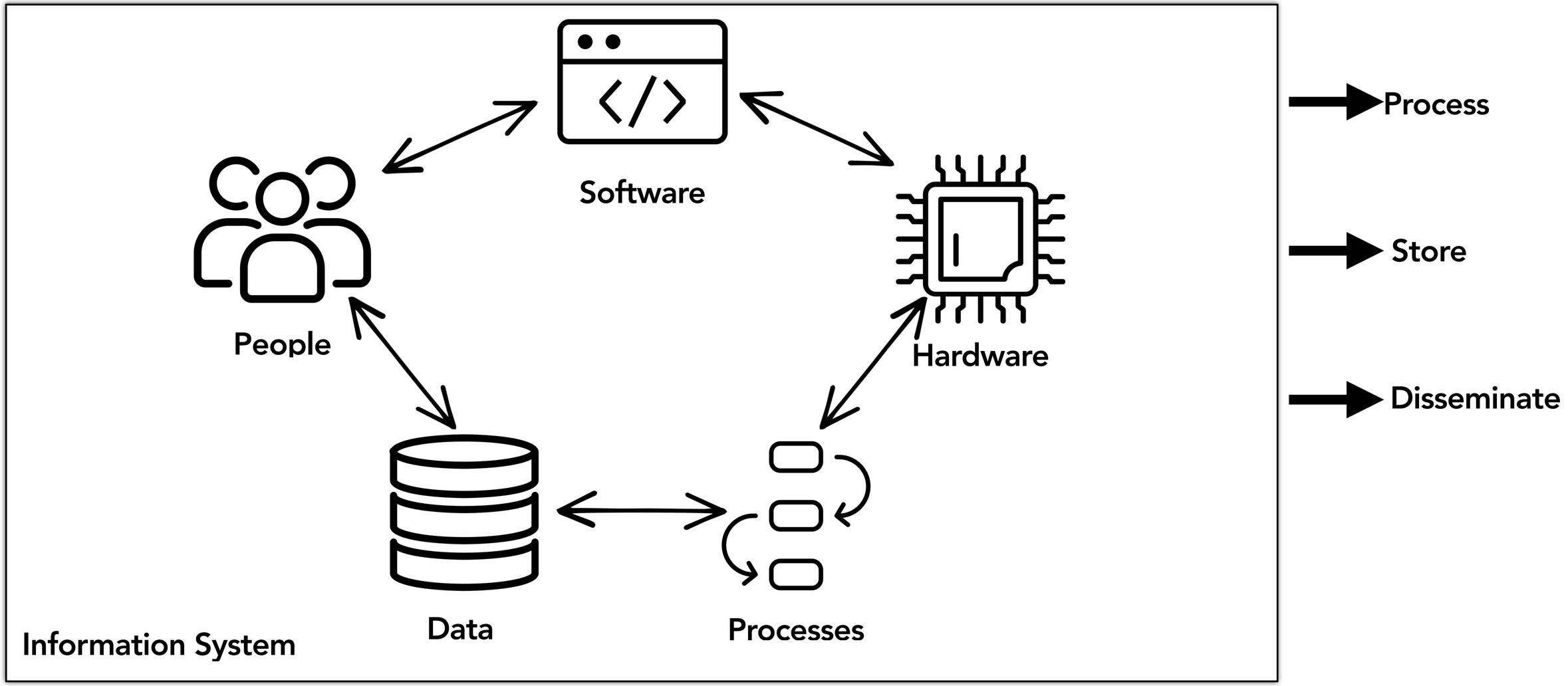
Blockchain-based information ecosystems

Francesco Salzano [1-3]
Lodovica Marchesi [1]
Remo Pareschi [2-3]
Roberto Tonelli [1]

[1] University of Cagliari (Unica)
[2] BB-Smile
[3] Stake Lab, University of Molise (Unimol)

DLT 2023 5th Distributed Ledger Technology Workshop

What is an Information system?



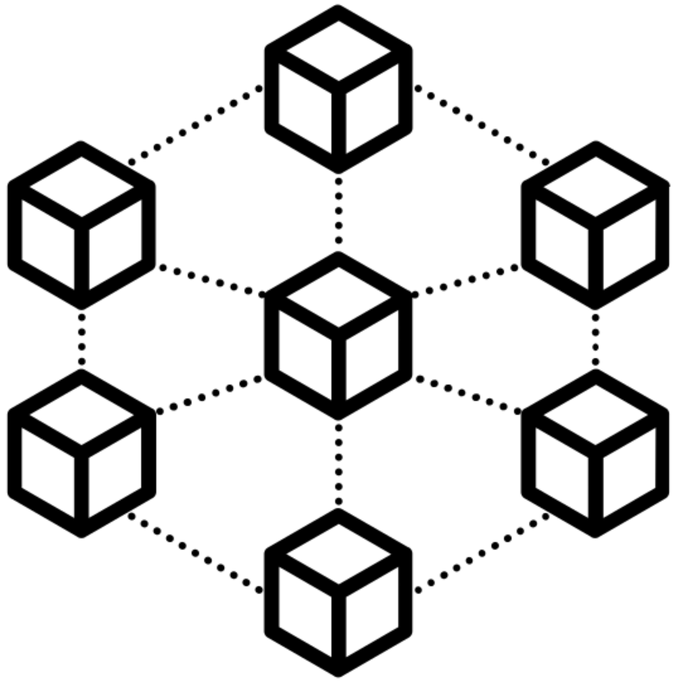
From Information system to Information ecosystem

- Need to share Business data
- Centralized decision-making power

Information Ecosystem

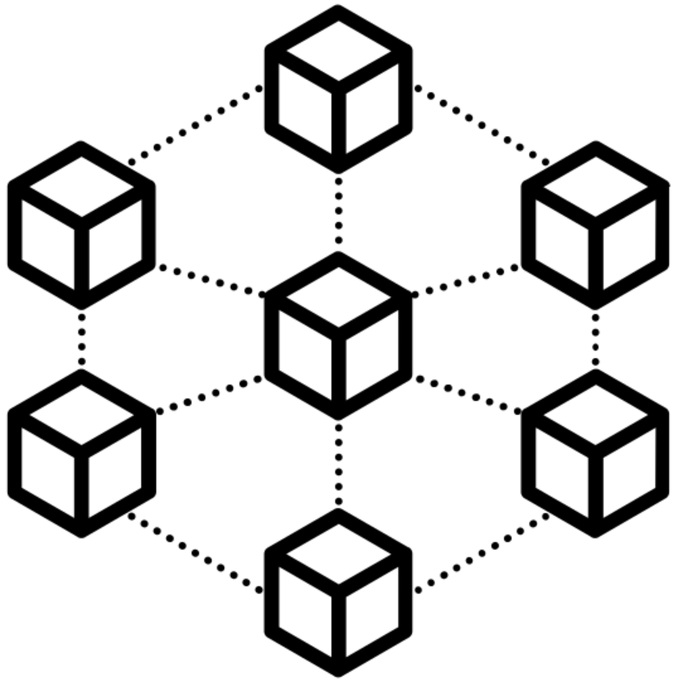
Information System

Blockchain & DLT in improving decision-making



Blockchain and DLTs
Lead to more democratic ecosystems through governance decentralization

Blockchain & DLT in improving decision-making



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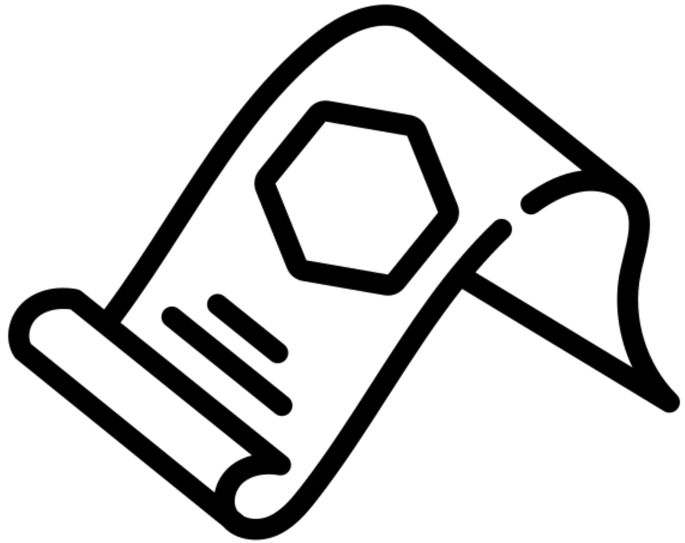
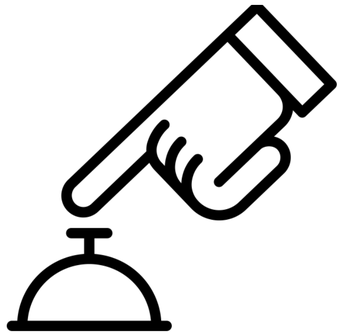
Lead to more democratic ecosystems through governance decentralization



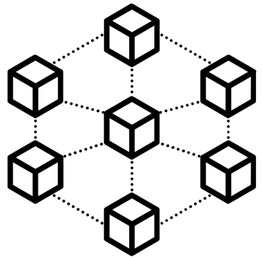
Smart Contracts
Power blockchains and DLTs to execute distributed business logic

Blockchain-based applications



Client Request

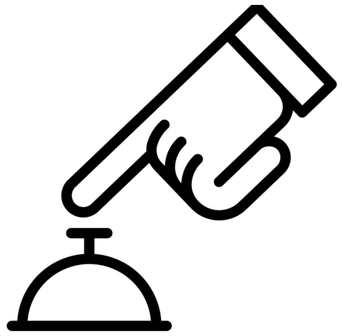
Blockchain business logic



Smart Contracts

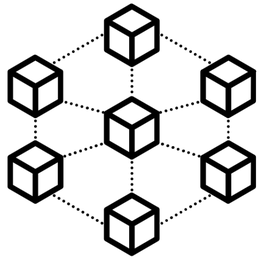
Run business logic on a blockchain network

Blockchain-based applications



Client Request

Blockchain business logic



Smart Contracts

Run business logic on a blockchain network

Immutability

Once a smart contract is deployed, the code cannot be changed by a party unilaterally.

Transparency

Once a smart contract is deployed on a blockchain, its code is public and readable

Blockchain-based Information Ecosystems*

Francesco Salzano[1,2][0000−0002−1029−4861], Remo Pareschi[2,3][0000−0002−4912−582X], Lodovica Marchesi[1][0000−0002−0627−5043], and Roberto Tonelli[1][0000−0002−9090−7698]

[1] Dep. of Mathematics and Computer Science of University of Cagliari, Palazzo Delle Scienze, Via Ospedale, 72, 09124 Cagliari CA, Italy
[2] Stake Lab, University of Molise, Campobasso, Italy
[3] BB-Smile Srl, Rome, Italy
francesco.salzano@unica.it, lodovica.marchesi@unica.it

Abstract. This study proposes a high-level architecture for deploying blockchain-based information ecosystems (BBIEs) by leveraging and expanding the Blockchain-as-a-Service (BaaS) concept. The proposed architecture integrates blockchain with the overall information ecosystem to enable trust management and coordination systems in inter-organizational contexts. An Identity Management System (IMS) ensures scalability and security. A case study is presented from the field of fiber cabling of urban centers involving building companies, a monitoring company, and a BaaS provider. The architecture offers a promising approach to prevent the risks of a "blockchain winter" by going beyond the limited scope of the traceability applications so far pursued in industrial deployments of the blockchain and to break the traditional domination scheme of a leading company in business consortia.

Keywords: Information system · Blockchain · Blockchain Oriented Software Engineering (BOSE) · Blockchain as a Service (BaaS).

1 Introduction

Information systems have marked the history of the organizational transformations of companies from the second half of the twentieth century to the present day [17, 14]. The concept of an information system, which in its basic version is a collection of technologies, processes, and people who work together to produce information that supports the goals and objectives of the organization, has evolved and has been shaped by advances in technology, changes in the business environment, and new theories about how information can be used to support decision making and problem solving [6].

Information systems have a long story that begins in the 1950s and 1960s when mainframe computers were used to automate business processes such as

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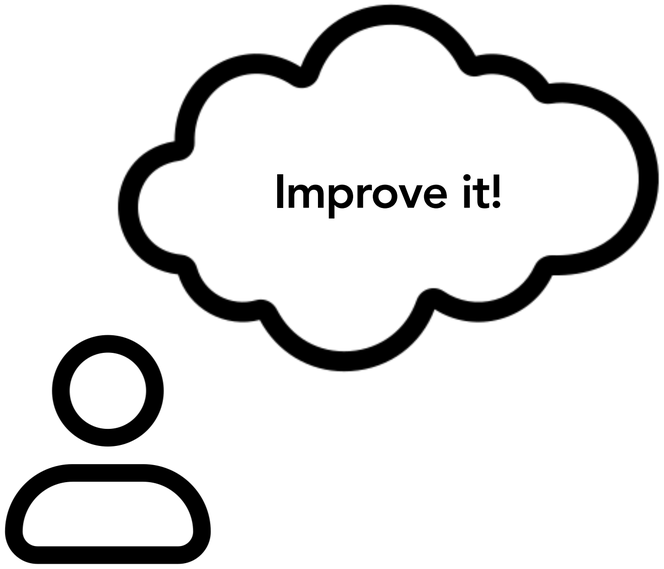
- Concept and design of a blockchain-based information ecosystem (BBIE)
- BBIE architecture
- BBIE components's interactions

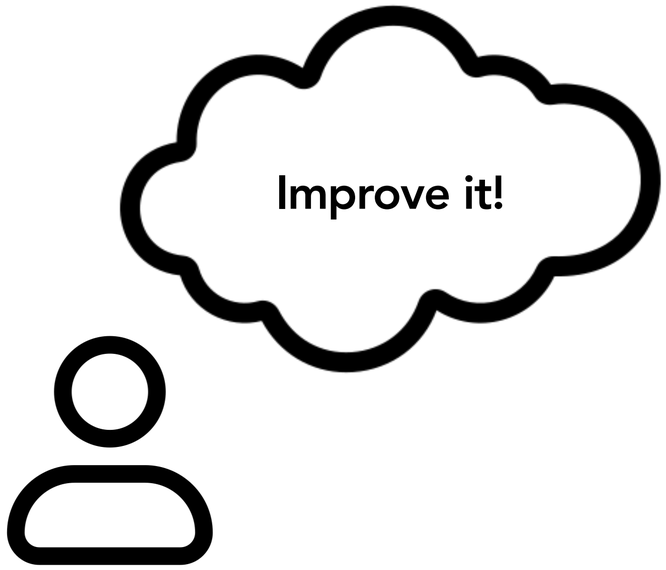
The Legacy Dilemma



Need investment

Deal with old and intricate system

The Legacy Dilemma

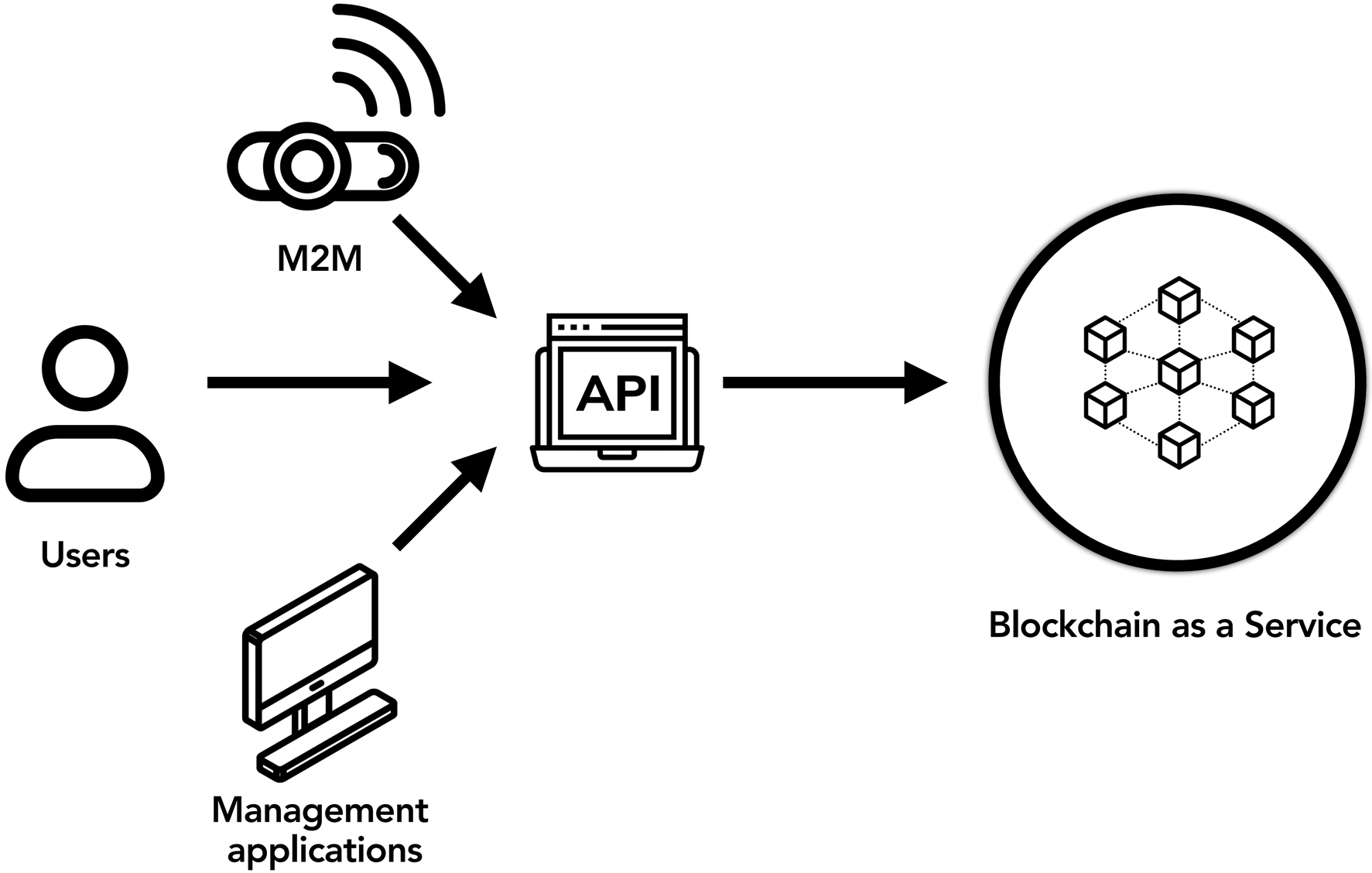


Need investment

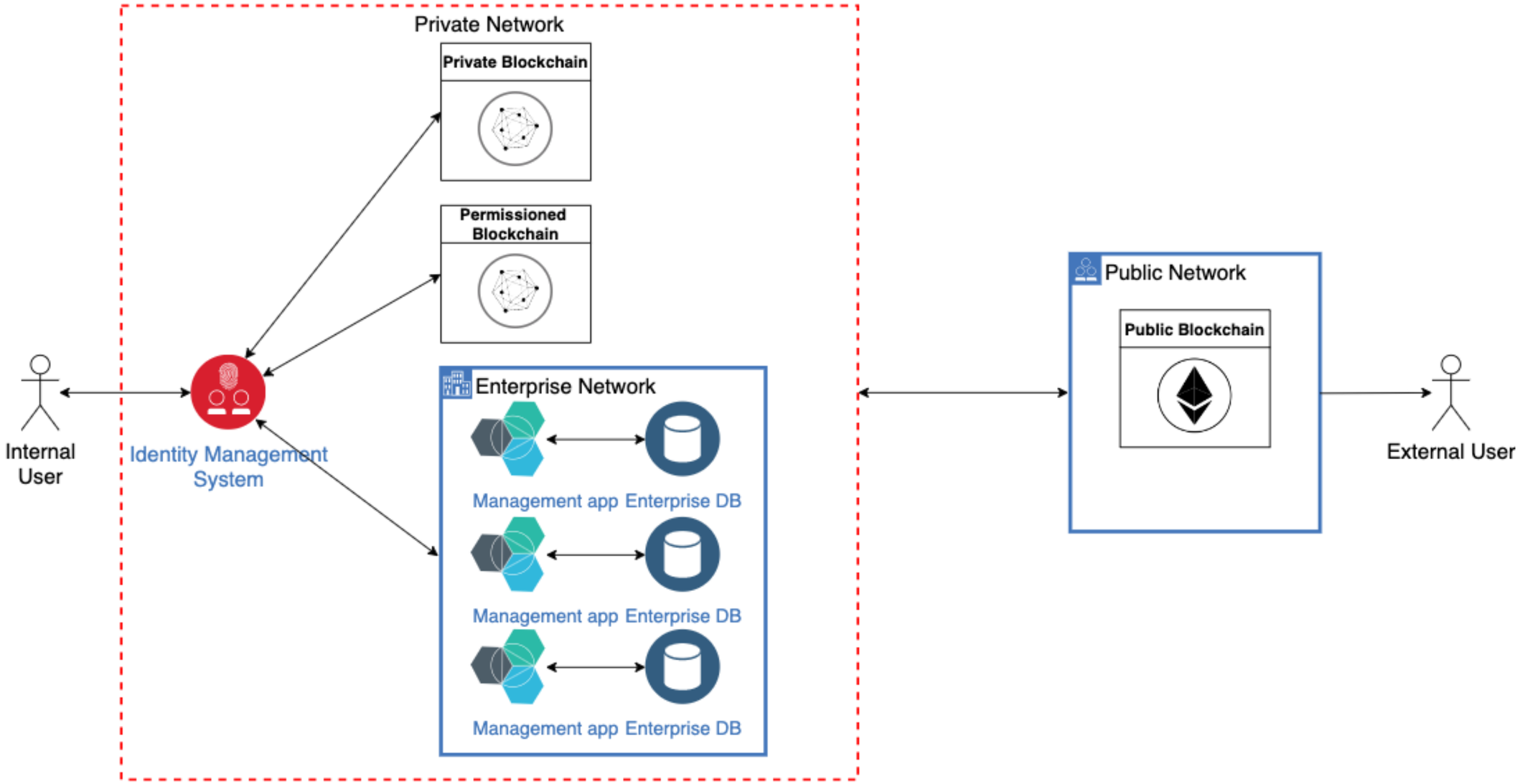
Deal with old and intricate system

We should make integration as easy as possible

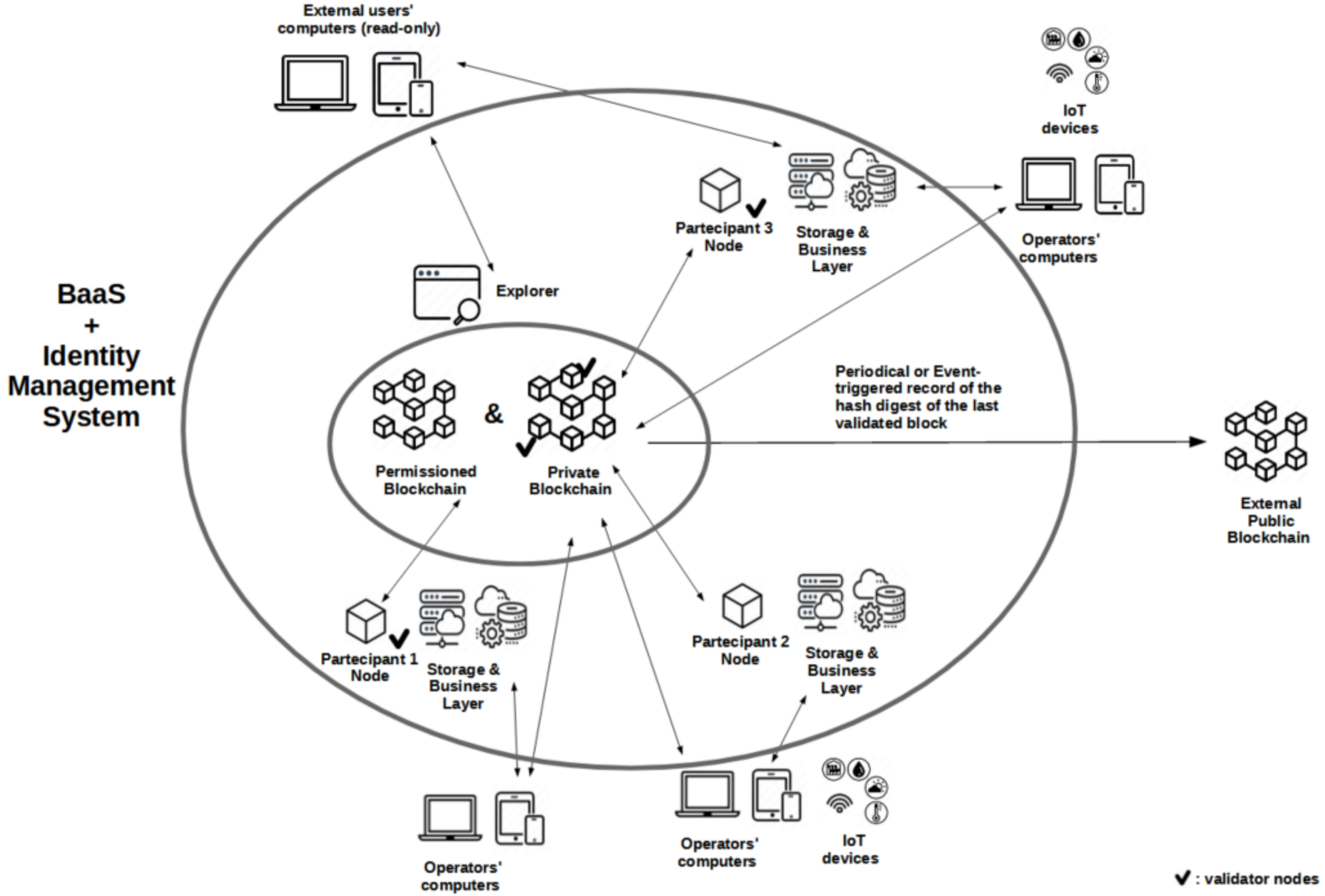
Blockchain as a Service: BaaS



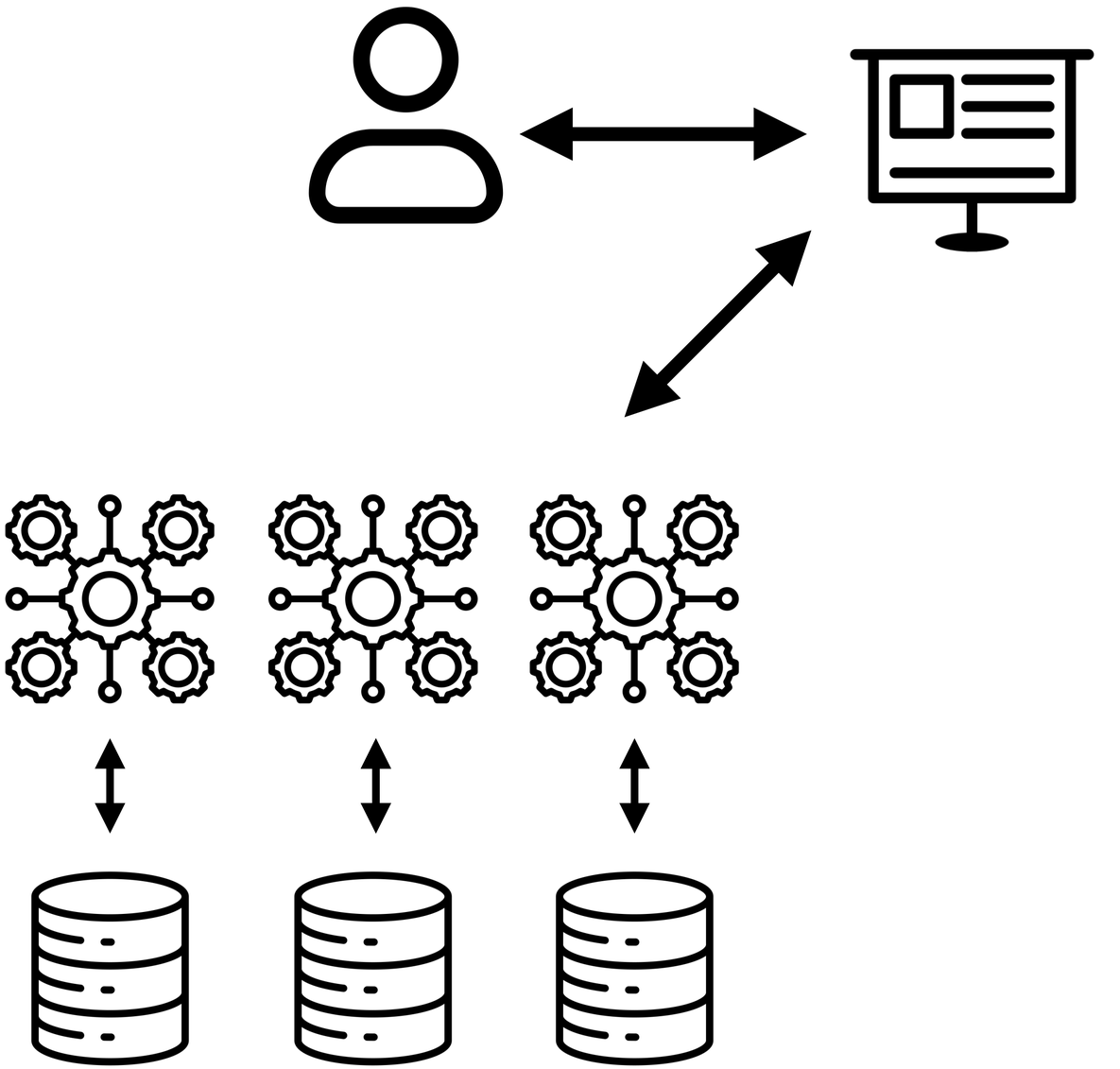
BBIE high level base architecture



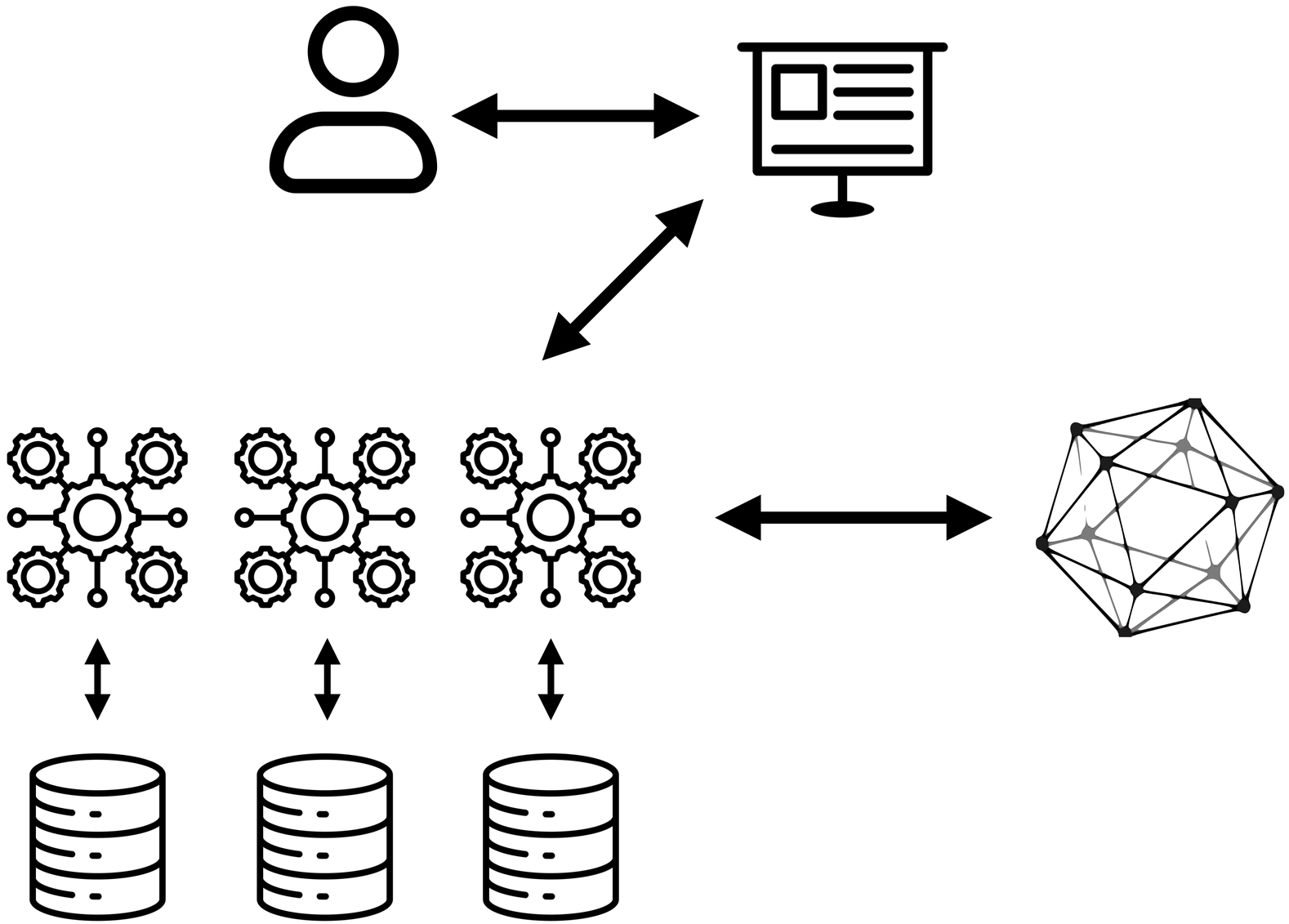
BBIE on-chain business logic



BBIE component interactions



BBIE component interactions



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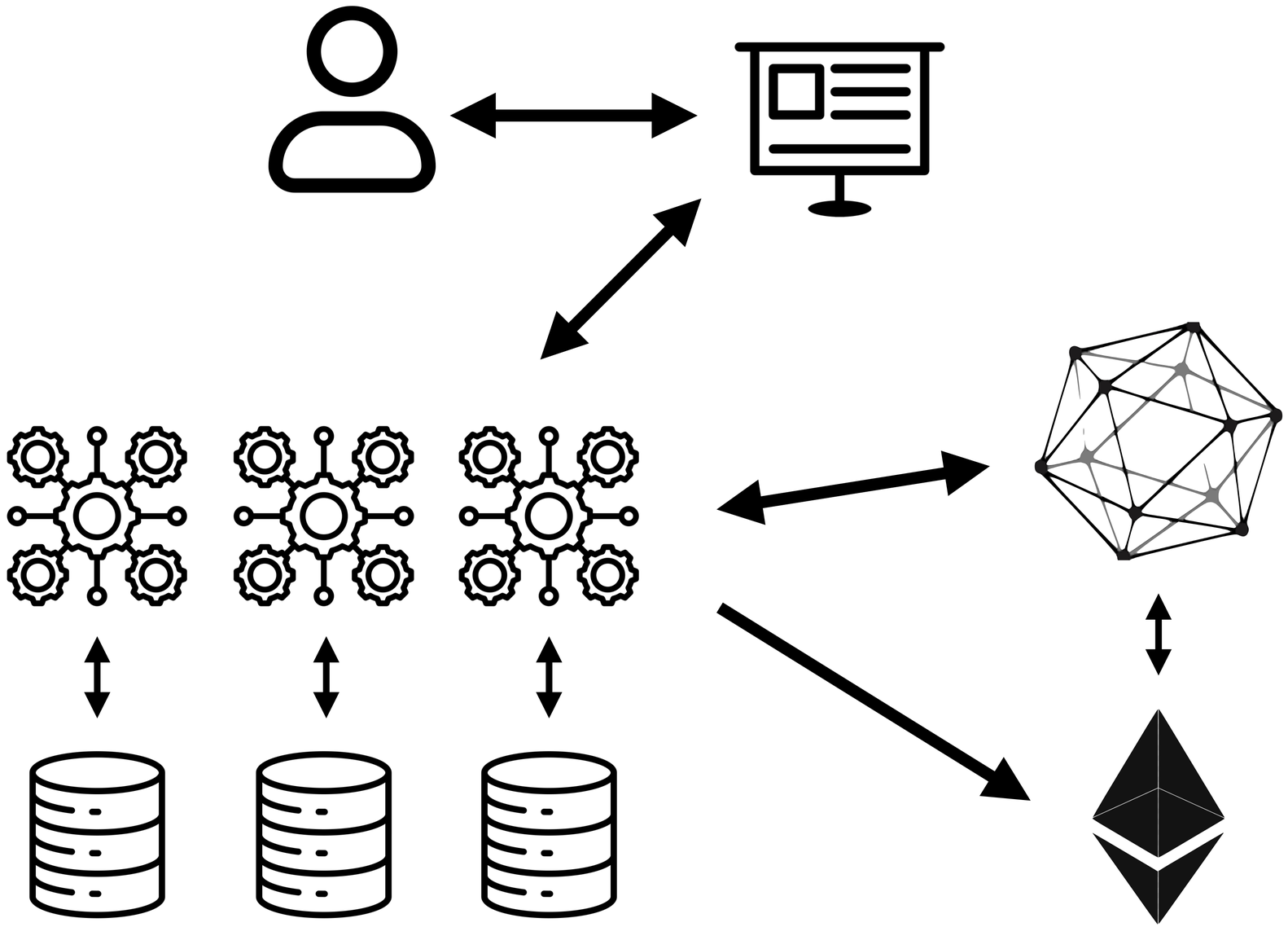
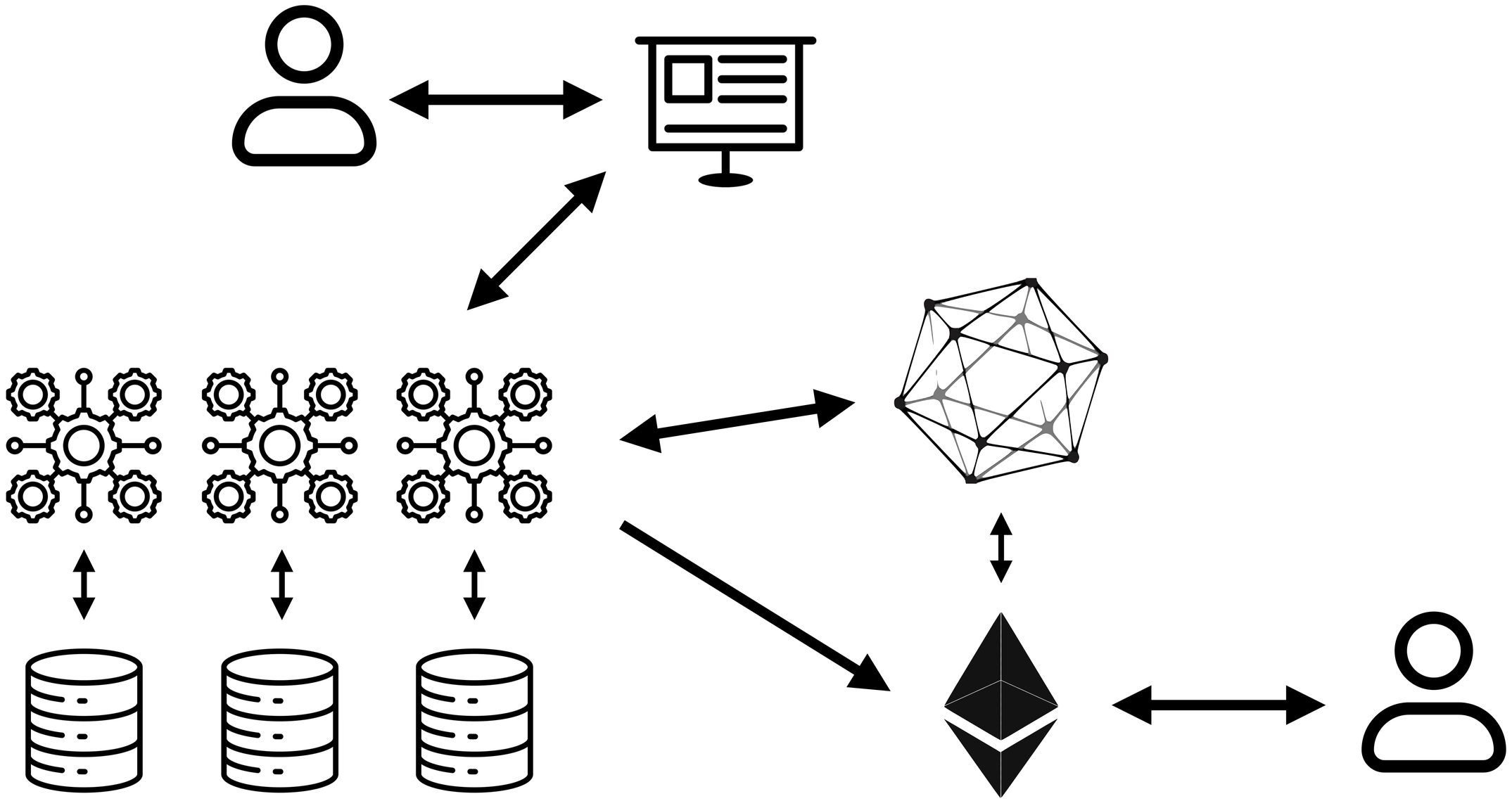
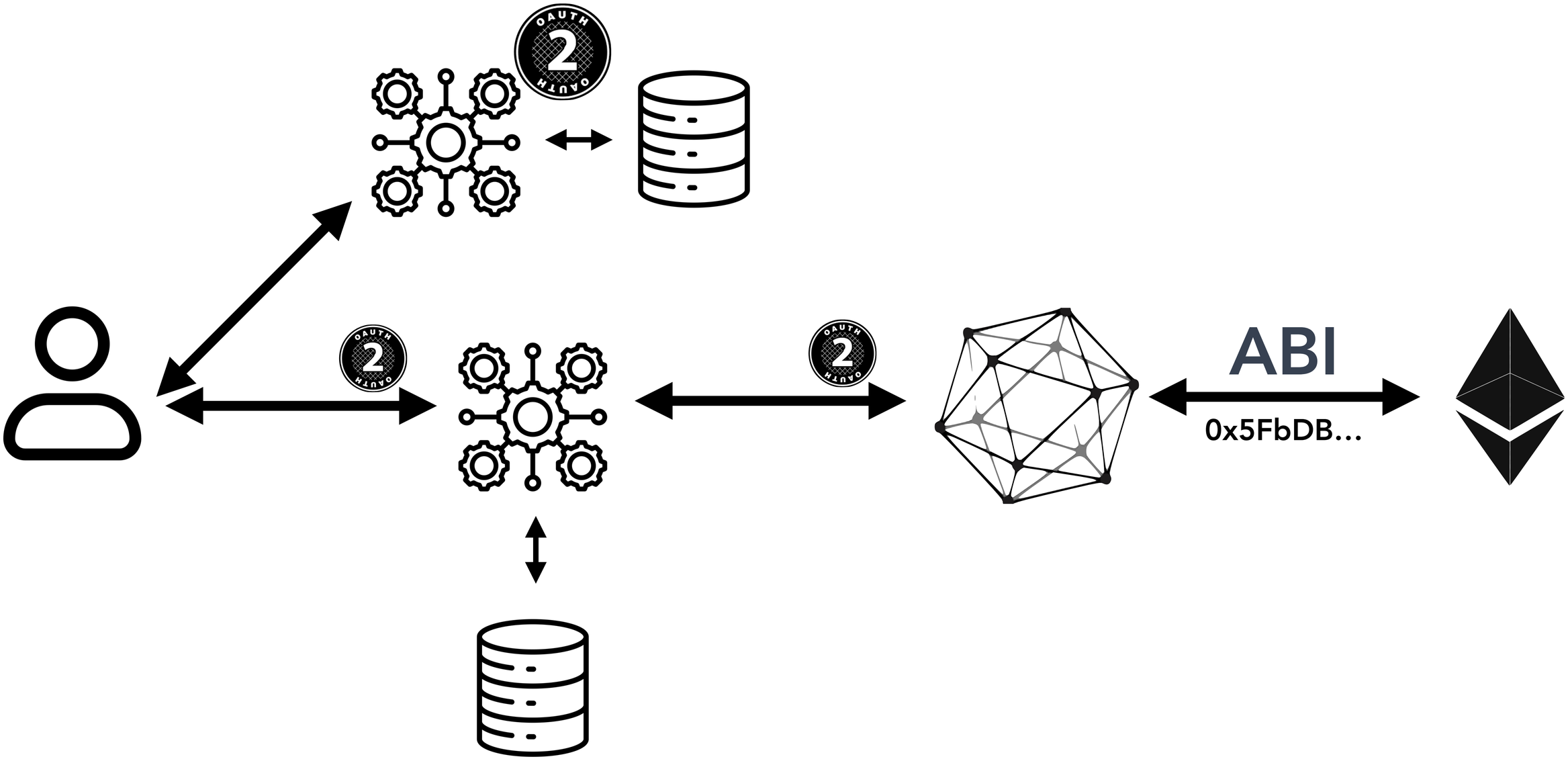


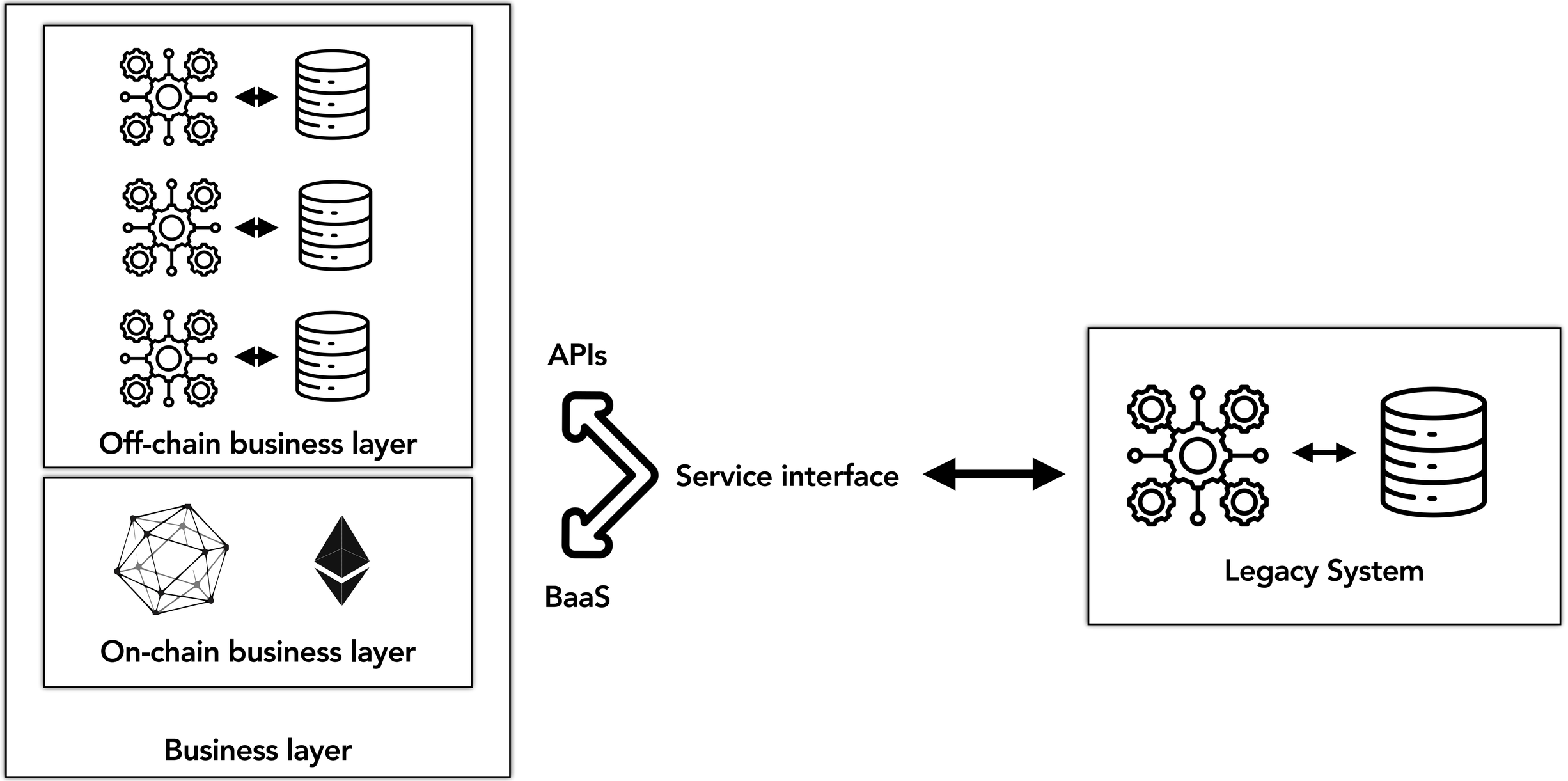
BBIE component interactions



Discussion: managing identities in BBIEs.

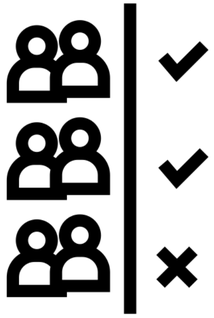


Discussion: integration with legacy or pre-existing systems

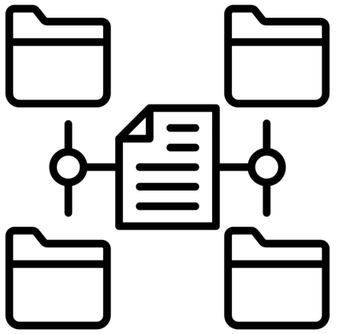


Discussion: Advantages of blockchain integration

Equitable profit sharing



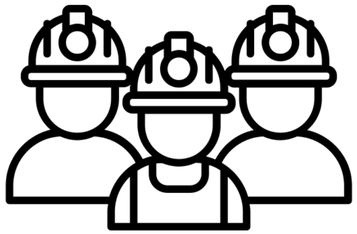
More democratic decision-making



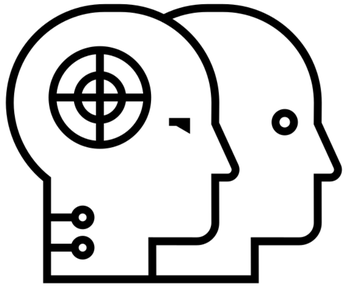
Shared business data

Case study: Cabling an urban area

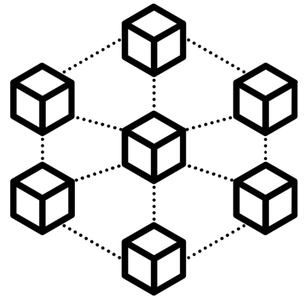
Case Study: involved actors



Building Companies



Monitoring Digital Twin



BaaS Provider

Blockchain-based information ecosystems

Thank you for the attention!

Francesco Salzano* [1-3]
Lodovica Marchesi [1]
Remo Pareschi [2-3]
Roberto Tonelli [1]

* francesco.salzano@unica.it