Blockchain-based information ecosystems

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What is an Information system?

Information System

- People
- Data
- Processes
- Software
- Hardware
- Store
- Disseminate
- Process
From Information system to Information ecosystem

- Need to share Business data
- Centralized decision-making power
Blockchain and DLTs lead to more democratic ecosystems through governance decentralization.
Blockchain & DLT in improving decision-making

Blockchain and DLTs
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*

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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 [7,14]. 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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The Legacy Dilemma

- Improve it!
  - Need investment

- Keep the legacy System!
  - Deal with old and intricate system
The Legacy Dilemma

Improve it!
Need investment

Keep the legacy System!
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
Discussion: managing identities in BBIEs.
Discussion: integration with legacy or pre-existing systems

Off-chain business layer

On-chain business layer

Business layer

Legacy System

APIs

Service interface

BaaS
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!

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