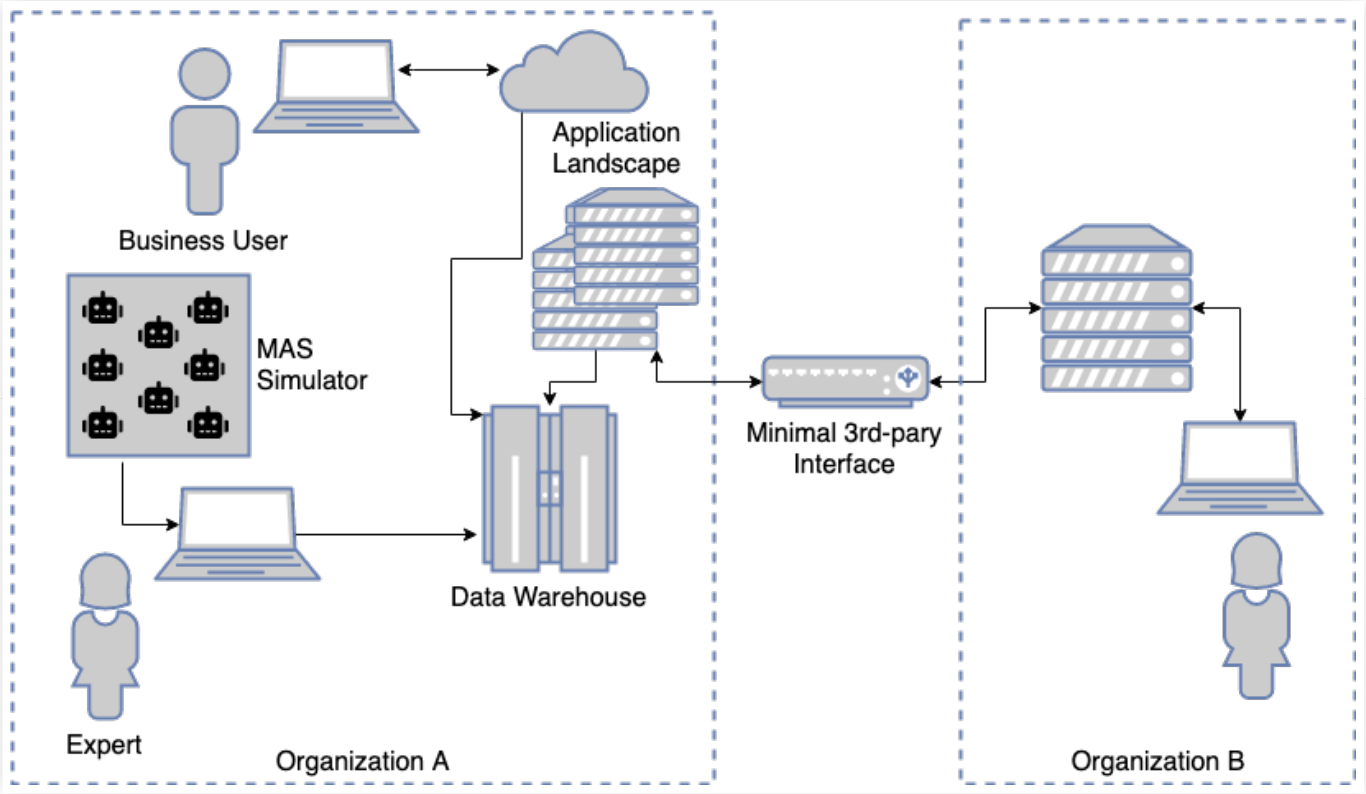
AGENDA

- Motivation
- Business process management, MAS & BCT
- ABS as (decentralized) business rules
- Architecture
- Proposed tech stack
- ABS on public block chains
- Future work

MOTIVATION I

- Agent-based simulations are typically not fully integrated into enterprise application landscape
- However, increasing degree of autonomy of enterprise applications calls for seamless integration of ABS
- BCT as potential technology for cross-organizational integration

MOTIVATION II



ABS & BCT

- BCT considered promising in facilitating MAS research adoption in practice
- ABS provides potential synergies
- Industry buzzwords: *digital twin*, *autonomous enterprise*, *robotic process automation*

Calvaresi et al. "Multi-agent systems and blockchain: Results from a systematic literature review."

BPM & BCT

- BCT considered promising for cross-organizational BPM/BPX
- Academic prototype for BPX on block chain exist
- Can BCT fulfill its promise?
- Is the problem really trust or interoperability plus coordination challenge?

Mendling et al. "Blockchains for business process management-challenges and opportunities."
López-Pintado et al. "Caterpillar: A Blockchain-Based Business Process Management System."

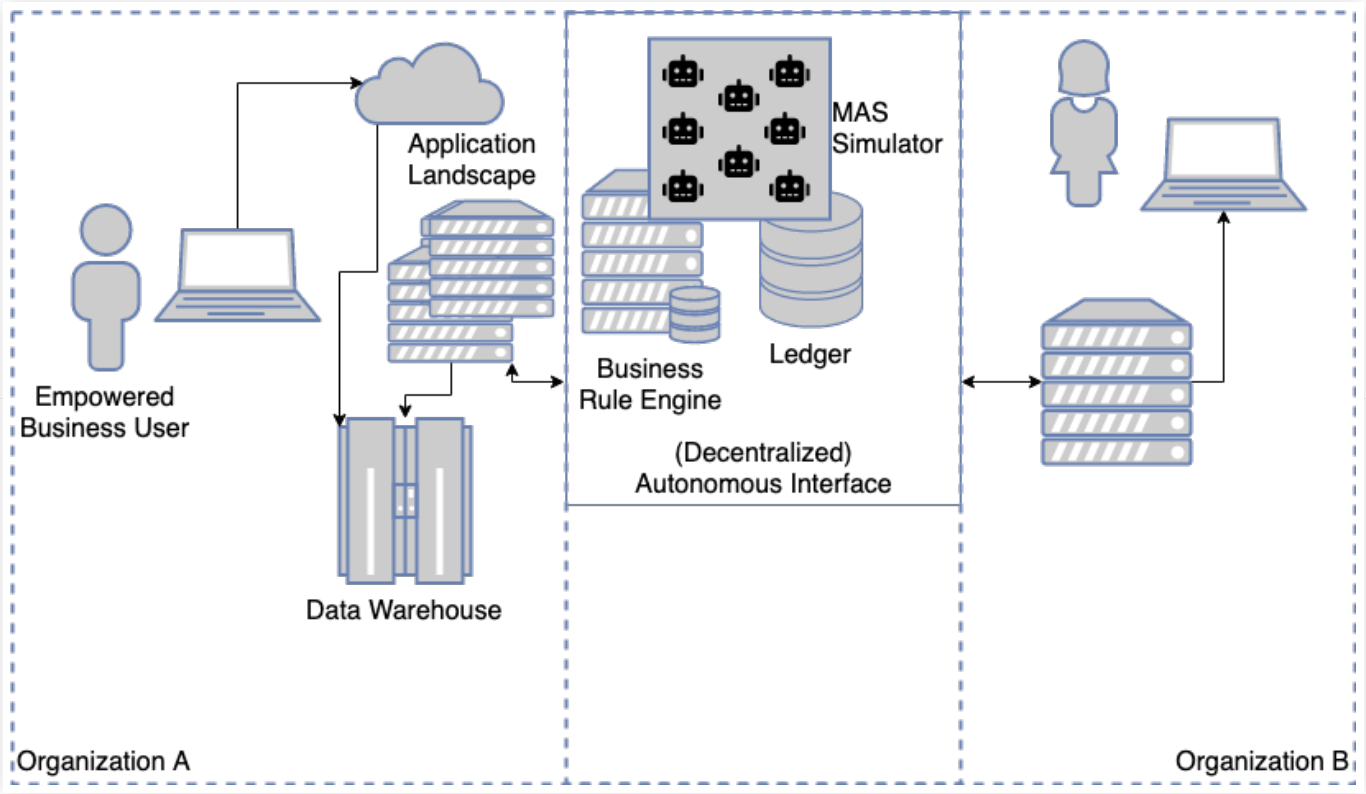
BUSINESS PROCESS MANAGEMENT, ABS & BCT III

→ Some work at intersection BPM, ABS, and BCT exists

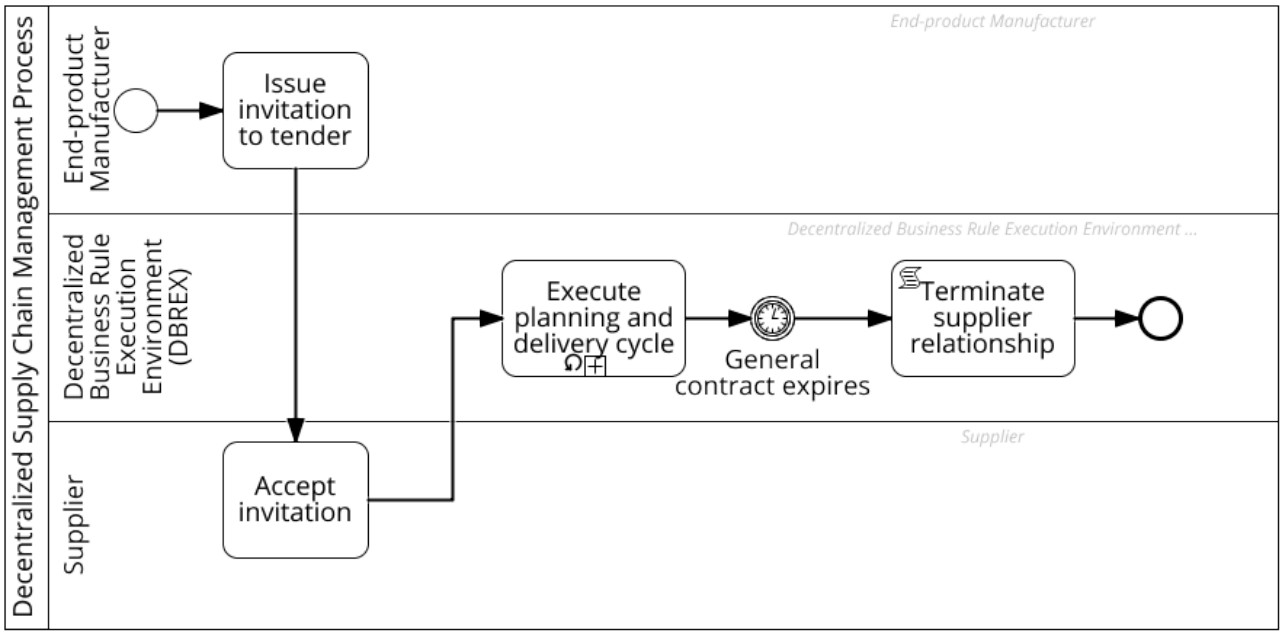
→ "on-chain ABS" not explored in BPM context

Kampik et al. "MAS-Aided Approval for Bypassing Decentralized Processes: an Architecture."

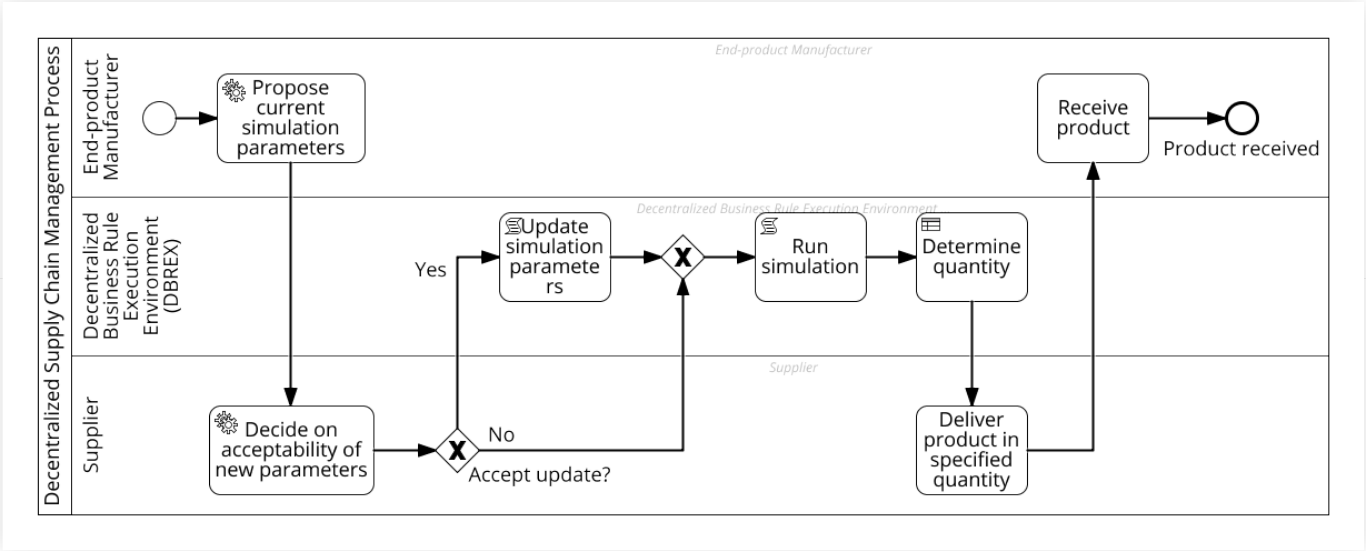
ABS AS DECENTRALIZED BUSINESS RULES I



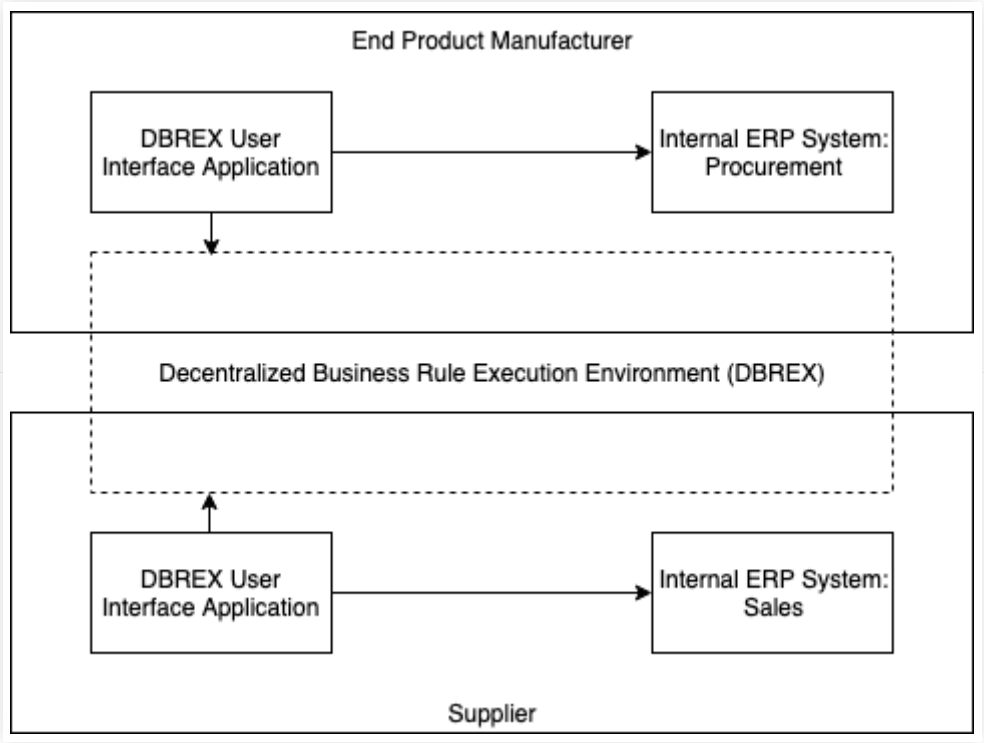
ABS AS DECENTRALIZED BUSINESS RULES II



ABS AS DECENTRALIZED BUSINESS RULES III



ARCHITECTURE



PROPOSED TECH STACK I

- Application execution runtime: Node.js
- Decentralized execution environment: Hyperledger Fabric
- Multi-agent simulation library: JS-son

ABS ON PUBLIC BLOCK CHAINS

\+ Ad-hoc participants, *open market*

– Performance and security issues

– Snake oil++?

FUTURE WORK

- Implement proposed architecture as generic Node.js library for Hyperledger
- Provide an in-depth perspective of the alternative *centralized* architecture
- Evaluate the approach in a first pilot project

QUESTIONS?

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