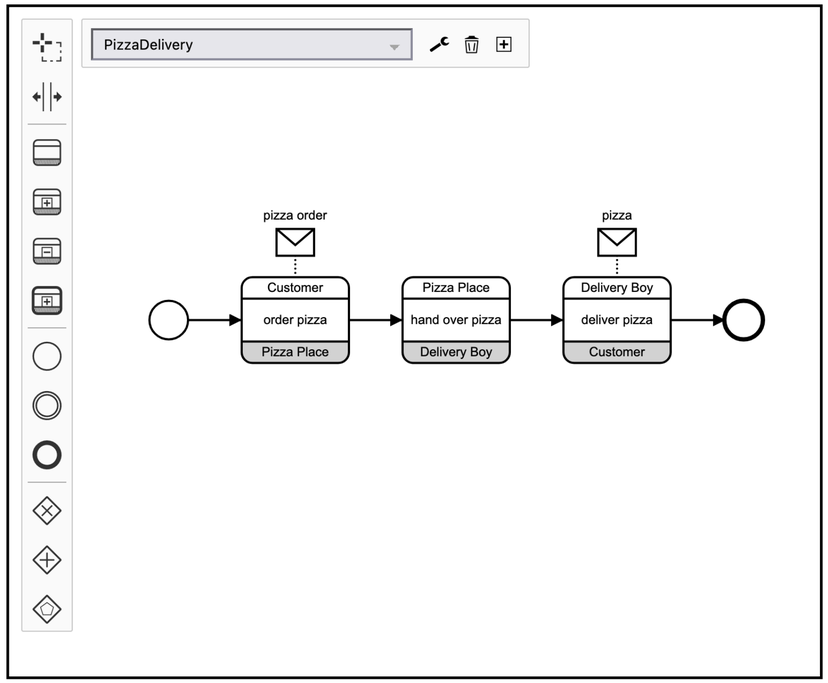
Chair of IT Service Management, Development and Operations
TUM School of Computation, Information and Technology
Technical University of Munich

Round-Trip Engineering for Blockchain-Based Business Processes

Bachelor Thesis

- Developing blockchain applications is challenging due to its complexity and security relevance.
- Model-driven engineering (MDE) paradigm can address these challenges, by translating graphical models into code [1].
- Chorpiler is a tool than can translate BPMN models into smart contracts [3]. However, **what happens when the model changes?**
- Currently, custom code is discarded when the source model changes. In this thesis, we want to implement round-trip engineering capabilities, so that custom code is preserved when the source model changes.



A BPMN Choreography (chor.js), which Chorpiler can turn into a smart contract.

[1]: Di Ciccio, C., Cecconi, A., Dumas, M., Garcıa-Banuelos, L., Lopez-Pintado, O., Lu, Q., Mendling, J., Ponomarev, A., Binh Tran, A., Weber, I.: Blockchain Support for Collaborative Business Processes. Informatik Spektrum 42(3) (2019) 182–190
[2]: https://wizard.openzeppelin.com, accessed 2026-09-25.
[3]: https://github.com/fstiehle/chorpiler, accessed 2026-09-25.

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Tasks

1. Familiarise yourself with the Chorpiler [3] framework and the previous work based on the Diamond pattern standard [4].

2. Based on existing work, implement Round-Trip Engineering capabilities into Chorpiler 2.0, and evaluate it in terms of correctness and gas cost and demonstrate different use cases.

The extension shall introduce:

- Full forward and backward synchronisation (if the code changes, the model updates, if the model changes, the code updates)

[2]: https://wizard.openzeppelin.com, accessed 2026-09-25.
[3]: https://github.com/fstiehle/chorpiler, accessed 2026-09-25.
[4]: https://eips.ethereum.org/EIPS/eip-2535, accessed 2026-09-25.

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Contact

Every theses starts with an exposé, where you shape the topic towards your interest (in consultation with us). If you're interested, please contact us as outlined at https://www.cs.cit.tum.de/en/isdo/teaching/theses/.

Recommended Prerequisites

Familiarity with blockchain technology and business process management; Strong programming skills, especially in JavaScript and Typescript.

Important Reading / References

[1]: Di Ciccio, C., Cecconi, A., Dumas, M., Garcıa-Banuelos, L., Lopez-Pintado, O., Lu, Q., Mendling, J., Ponomarev, A., Binh Tran, A., Weber, I.: Blockchain Support for Collaborative Business Processes. Informatik Spektrum 42(3) (2019) 182–190
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[3]: https://github.com/fstiehle/chorpiler, accessed 2026-09-25.
[4]: https://eips.ethereum.org/EIPS/eip-2535, accessed 2026-09-25.