

Topic 01: At the Interface of Process Mining and Simulation – Applying Simod to Financial Services

Process mining is a growing research field with increasing importance for industry and practitioners. As process mining offers a structured analysis of data sets, it serves primarily to increase transparency of the current status or historical data. It is hence logical to combine it with another methodology to come up with improvement measures. Business Process Simulation (BPS) is a commonly used measure to evaluate process changes and alternatives without experimenting with the real system. Existing literature has made some propositions, which address rather specific challenges or provide a full approach, like the automated approach called Simod (Camargo et al., 2020).

This master thesis focuses on creating an artificial event log by simulation and applying Simod on this artificial event log. A real-world mortgage application process from the financial services industry can serve as a basis for the data creation. Simod is then applied to the data set, creating a simulation model, which can be compared to the simulation model used for creating the artificial event log at the first place. Hence, by applying process mining and Simod to the artificial data, the Simod technique can be critically reviewed. Special attention should be paid to any shortcomings or unresolved challenges of the automated approach. Likewise, the student should point out the strengths of Simod.

The objectives of this thesis are to:

- conduct a literature review of existing works about process mining used for simulation with special focus on Simod and any reviews of it,
- create an artificial event log and apply Simod to it,
- and provide a critical review of the Simod approach, highlighting the strengths as well as any shortcomings or unresolved challenges.

Basic Literature:

Camargo, M., Dumas, M., & González-Rojas, O. (2020). Automated discovery of business process simulation models from event logs. *Decision Support Systems*, 134, 113284.

Camargo, M., Dumas, M., & González-Rojas, O. (n.d.). Simod: A Tool for Automated Discovery of Business Process Simulation Models, <http://ceur-ws.org/Vol-2420/paperDT5.pdf>

Martin, N., Depaire, B., & Caris, A. (2016). The use of process mining in business process simulation model construction. *Business & Information Systems Engineering*, 58(1), 73-87.

Mărușter, L., & van Beest, N. R. (2009). Redesigning business processes: a methodology based on simulation and process mining techniques. *Knowledge and Information Systems*, 21(3), 267-297.