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Bachelorarbeit / Masterarbeit

Blockchain-enabled Data Quality Tracking in Event Logs

Process mining is a novel technology that helps organizations to better understand their business processes. Over the last 20 years, there has been intensive research into various process mining techniques. These techniques support the automatic discovery of business process models from event log data, the checking of conformance between specified and observed behavior, the identification of various variants of a business process, non-compliant behavior, performance-relevant insights, and so forth.

Reliable process mining results are, however, contingent on starting with high-quality event logs. In practice, event logs are often far from the desired quality. Therefore, an event log should not be naively used for process mining without ensuring that the event log is of adequate quality. To improve the quality of event logs, some (automated) approaches are already available to identify and repair event log quality issues. Nevertheless, retrospective adjustments greatly impair the trust and confidence in the accuracy of event logs. In this context, using blockchain to track modifications that have been made to the data since the initial data recording could be of great assistance. Blockchain technology is supposed to provide high data reliability, integrity, and auditability. Yet, research on its application for providing data integrity in the context of event logs is lacking.

To maintain the trust and believability of event logs, the aim of this thesis is to investigate how block chain can be applied to track the data quality of event logs from the initial recording onwards. A prototypical implementation is highly appreciated.

The thesis can be written in either English or German language.

Empfohlene Einstiegsliteratur:

- Dixit, P. M., Suriadi, S., Andrews, R., Wynn, M. T., ter Hofstede, A. H., Buijs, J. C., & van der Aalst, W. (2018). Detection and interactive repair of event ordering imperfection in process logs. In *International Conference on Advanced Information Systems Engineering* (pp. 274-290).
- Van Der Aalst, W. et al. (2011). Process mining manifesto. In *International Conference on Business Process Management* (pp. 169-194).
- Lockl, J., Schlatt, V., Schweizer, A., Urbach, N., Harth, N. (2020). Toward Trust in Internet of Things Ecosystems: Design Principles for Blockchain-Based IoT Applications. In *IEEE Transactions on Engineering Management*, doi: 10.1109/TEM.2020.2978014.

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