Process Optimization using Process Mining

A study case for Albania

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Abstract

Process mining is a powerful data analysis technique that uses event logs to visualize, analyze, and improve business processes. The primary objective of this research is to emphasize the significance of implementing this approach to optimize business processes in Albania. The event log is the foundation of process mining as it contains the necessary data from where inefficiencies, bottlenecks, and deviations can be identified. As such, the advantages were observed throughout the analysis of the illustrative study case with the event log synthesized from a loan application system of a financial institution. Moreover, the observations lead to recommendations and enhancements that can improve the overall process performance. The results contribute to the insufficient body of literature on process mining in Albania, and offer practical implications for organizations seeking to adopt process mining in their operations.

Keywords: process mining, optimization, efficiency, data visualization, business process re-engineering

1 Introduction

Process optimization is a critical component of business operations, as it aims to identify and eliminate inefficiencies in processes, leading to increased productivity, reduced costs, and improved quality. By leveraging process mining, organizations can gain insights into their processes.

The research aims to explore the potential of using advanced process mining techniques as a tool for gaining novel insights from event data and for identifying performance or compliance issues. Process mining is an emerging field with significant potential for adoption and as such, a case is made for its application in the context of the Albanian market by considering the possible benefits as well as the challenges associated with it.

2 Approach

The dataset used in this research is designed to replicate the loan application process of an Albanian financial institution, including the steps involved, the actors, the time durations and additional information. The synthetic data was generated using simulation tools, and it was calibrated to match the statistical characteristics of the real data. The event log is available online on Github for further analysis and replication of the study [1].

The dataset is then analysed through process discovery and conformance checking techniques using ProM. Process discovery involves analyzing the event logs generated by the system to extract information on the sequence of events that took place, while conformance checking compares the actual process execution with the ideal process model and identifies any deviations.

3 Experimental Setup

Throughout this study ProM 6.12 [2] is used as a stable release version designed for researchers. It is an extensible framework that supports a wide variety of process mining techniques in the form of plug-ins. As a result, it is heavily utilized in this study due to its comprehensive implementation of various miners, customizable through many parameters, as well as its array of advanced conformance checking techniques.

4 Conclusion

The study examines the use of process mining as a tool for improving processes in Albania. Several challenges are highlighted that need to be addressed to ensure the effectiveness of process mining. Data quality is a significant concern, where the lack of reliable data can limit the usefulness of process mining. Data privacy is also a challenge, as personal and confidential data needs to be protected during the analysis. Additionally, the results of the analysis can be complex and challenging to interpret, making it difficult to make informed decisions. The study concludes that process mining has the potential to optimize processes in Albania but emphasizes the need for a concerted effort from businesses, stakeholders, and researchers.

References

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