

## Introduction to the Minitrack on Business Process Technology

Henrik Leopold  
Kühne Logistics University  
[henrik.leopold@the-klu.org](mailto:henrik.leopold@the-klu.org)

Han van der Aa  
University of Mannheim  
[han.van.der.aa@uni-mannheim.de](mailto:han.van.der.aa@uni-mannheim.de)

Hajo A. Reijers  
Utrecht University  
[h.a.reijers@uu.nl](mailto:h.a.reijers@uu.nl)

Organizations have been striving to better understand, analyze, improve, and automate their business processes for decades. Yet, recent advancements in the area of Business Process Technology, such as *process mining* and *robotic process automation* (RPA), have equipped organizations with entirely new means to achieve this goal. Process mining allows organizations to exploit transactional data recorded by information systems to improve business processes with respect to performance dimensions such as efficiency, quality, and compliance. RPA provides the means to automate repetitive and routine-like work by employing so-called software robots. Furthermore, by combining developments from areas such as machine learning and predictive analytics, process weaknesses, such as bottlenecks, cannot only be automatically identified, but also remedied by taking preventative actions.

Given the large interest in this topic in both academia and practice, the goal of this minitrack is to promote scientific exchanges on Business Process Technology. As such, the minitrack enables researchers to present and discuss innovative approaches, techniques, methodologies, and models to design, adopt, implement, operate, evaluate, and govern technology in the context of business processes.

It is the second time we are organizing this minitrack. Compared to the first edition, we were able to attract additional attention, bringing us to a total of ten submissions. After a careful review process, we accepted five high quality papers.

As for the content, four out of five of the accepted papers deal with process automation. From our perspective this is not surprising, since automation is on the agenda of almost every organization these days. We, however, see that research on process automation has many facets and can be approached from different angles: The paper from Rojas et al. proposes a new method to generate synthetic event logs for evaluating RPA techniques. The paper from Eggers et al. presents a software development framework that provides SMEs with guidelines to navigate decentralized RPA projects. The paper from

Ruha et al. reports on an action research study shedding light on how RPA ties in with the notions of digital options and technical debt. Finally, the paper from Vu et al. conducts a structured market analysis to develop a comprehensive overview of the business process automation capabilities currently offered by industrial vendors. The process mining paper of our track, by Rehse et al., conducts a systematic study to analyze the visualization capabilities of academic and commercial process mining tools by means of a visual analytics framework.

Below, we provide an overview of the accepted papers, their authors, and the corresponding abstracts. We are happy to cover such a broad range of research methodologies and angles in the context of business process technology in our minitrack and look forward to discussing these papers during the conference. We wish to acknowledge the contributions of all authors and reviewers to the success of our minitrack and look forward to organizing another edition next year.

### **Supporting Subject Matter Experts as Developers: Towards a Framework for Decentralized Robotic Process Automation Development**

*Authors:* Julia Eggers, Judith Wewerka, Altus Viljoen, Helmut Krcmar.

*Abstract:* Robotic Process Automation (RPA) has emerged as promising automation technology in recent years. Firms seize RPA for fast and cost-efficient low-code process automation implemented and maintained decentrally in the business units by subject matter experts (SMEs) without IT development experience. However, decentralized RPA projects are reported to frequently fail and be prone to challenges as SMEs struggle to meet their new roles and responsibilities, such as developers or testers. Yet, research lacks an understanding of how challenges related to SMEs' roles and responsibilities unfold and how to address these challenges when executing decentralized RPA projects. To this end, our study employs a Design Science Research approach, drawing on literature and 14 expert interviews, to (1) systematically synthesize the challenges

related to SMEs' roles and responsibilities and (2) derive a software development framework for supporting SMEs in their new roles and responsibilities in decentralized RPA projects. Thus, our study contributes to RPA and low-code development research and provides SMEs with guidelines to navigate decentralized RPA projects in practice.

### **Robotic Process Automation from the Design-Capital Perspective – Effects on Technical Debt and Digital Options**

*Authors:* Lauri Ruha, Tapani Rinta-Kahila, Esko Penttinen

*Abstract:* Robotic process automation (RPA) is an instantiation of lightweight automation that allows organizations to automate manual business processes quickly and at low cost without modifying the organization's underlying deep information-systems structures. While RPA endows organizations with digital options (e.g., automation ability, cost savings), its implementation is bound to incur technical debt (i.e., accumulate unwarranted complexity in the IT architecture). The paper reports on an action research study shedding light on how RPA ties in with these two notions of a firm's design capital: digital options and technical debt. Findings indicate that RPA can create digital options through improvements in knowledge reach, knowledge richness, and process richness. These benefits come at the cost of accumulating technical debt which stems from additional technical complexity and maintenance obligations.

### **Process Mining Meets Visual Analytics: The Case of Conformance Checking**

*Authors:* Jana-Rebecca Rehse, Luise Pufahl, Michael Grohs, Lisa-Marie Klein

*Abstract:* Conformance checking is a major function of process mining, which allows organizations to identify and alleviate potential deviations from the intended process behavior. To fully leverage its benefits, it is important that conformance checking results are visualized in a way that is approachable and understandable for non-expert users. However, the visualization of conformance checking results has so far not been widely considered in research. Therefore, the goal of this paper is to develop an understanding of how conformance checking results are visualized by process mining tools to provide a foundation for further research on this topic. We conduct a systematic study, where we analyze the visualization capabilities of nine academic and seven commercial tools by means of a visual analytics framework. In this study, we find that the "Why?" aspect of conformance check-

ing visualization seems already be well-defined, but the "What?" and "How?" aspects require future research.

### **What is Business Process Automation Anyway?**

*Authors:* Hoang Vu, Henrik Leopold, Han van der Aa

*Abstract:* Many organizations strive to increase the level of automation in their business processes. While automation historically was mainly concerned with automating physical labor, current automation efforts mostly focus on automation in a digital manner, thus targeting work that is related to the interaction between humans and computers. This type of automation, commonly referred to as business process automation, has many facets. Yet, academic literature mainly focuses on Robotic Process Automation, a specific automation capability. Recognizing that leading vendors offer automation capabilities going way beyond that, we use this paper to develop a detailed understanding of business process automation in industry. To this end, we conduct a structured market analysis of the 18 predominant vendors of business process automation solutions as identified by Gartner. As a result, we provide a comprehensive overview of the business process automation capabilities currently offered by industrial vendors. We show which types and facets of automation exist and which aspects represent promising directions for the future.

### **A Tool-supported Method to Generate User Interface Logs**

*Authors:* Antonio Martínez Rojas, Andres Ramirez, Jose Gonzalez Enriquez, Hajo Alexander Reijers

*Abstract:* The rise of robotic process automation (RPA) fuels areas like robotic process mining and task mining. Although traditional process mining research can exploit a range of resources (i.e., event logs) to test and benchmark new techniques, that is not the case for robotic process mining. Moreover, benchmark data for RPA needs to incorporate detailed references and properties to elements of the graphical user interface that a software robot is intended to interact with. Therefore, it is not feasible to create such data by hand. To address this omission, the current paper proposes a tool-supported method to generate synthetic event logs for evaluating RPA techniques. To mimic real-life scenarios closely, these logs can be tailored to incorporate variations along a wide range of dimensions. As an application example of the method, the paper describes a case generator tool, which is publicly available, that can be used to benchmark robotic process mining proposals. We also elaborate on further applications of the method in ways that are beneficial to the BPM and RPA communities.