Task Support for Process Mining: From Formulating Questions to Evaluating Results

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Abstract. Despite the rising popularity of process mining in practice, executing a process mining project is a daunting task that requires significant expertise. As such, there is a pressing need to provide comprehensive support for *process analysts*. This tutorial aims to provide participants with an overview of state-of-the-art practices followed by process analysts at each stage of a typical process mining project, from defining questions to evaluating results. Based on empirical evidence and experience from several projects, we go over concrete strategies to support analysts, with a focus on specific tasks and areas that require extra attention. This sets the stage for further research in developing support for process analysts and allows identifying blind spots that future research might address.

Tutorial Content. This tutorial aims at providing participants with an overview of state-of-the-art practices followed by process analysts throughout a process mining (PM) project. The tutorial is organized as follows.

Part 1: Introduction. The tutorial starts by setting the scene and providing an overview of the objectives. Then, we specify the perspective that we will take: Rather than the enterprise level, we specifically focus on the *individual* and *team* levels. In particular, we choose to look at PM projects from the eyes of process analysts since individual support for process mining analysts is still lacking [5]. Therefore, we leave organizational activities such as obtaining project support and change management out of scope. We conclude this part with an agenda.

Part 2: Four Stages of Process Mining Projects. During the core part of the tutorial, we systematically walk through the different stages of a PM project. Existing PM methodologies focus on providing high-level guidance, often not dwelling on task-specific support. We use existing methodologies as a skeleton and enhance them with evidence gathered from practice to help make the guidance within high-level stages more tangible and relatable for the participants. Here, we build on our experience from interview, think-aloud and action research studies conducted in several research and applied projects. For each of the following stages, we discuss key tasks and areas where support might be needed using a running example based on a real project conducted in Dutch hospitals and give pointers on where to find more.

1. Define questions: How to develop questions for process mining? We draw on interviews with PM experts and present concrete examples of how pro-

cess analysts develop questions, closing with recommendations for question formulation and refinement [4].
2. Data collection and preparation: How to decrease the effort of event log extraction? We draw on a structured literature review of process mining case studies to present a taxonomy of human tasks in event log extraction [2] and illustrate how tasks can be automated through matching [3].
3. Mining and analysis: What strategies to adopt when analysing the data? From interviews with process analysts, we discuss strategies to structure a PM analysis and factors that influence their practical application [5].
4. Results: How should insights from the analysis be evaluated to be translated into concrete improvements? We draw on a structured literature review and action research to describe how artefacts and insights are currently evaluated with domain experts and outline concrete validation strategies [1].

Closing. We end by discussing takeaways and limitations before collecting additional suggestions for supporting process analysts from the audience.

Intended Audience. We invite academics and practitioners with some basic knowledge of process mining, such as: (1) researchers interested in state-of-the-art process mining practices, with a particular focus on developing support for process analysts, (2) students aiming to get an overview of strategies that process analysts apply in practice or understand where support for process analysts is lacking, and (3) practitioners wishing to gain knowledge in existing support for individuals involved in process mining projects.

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