

Chapter 8

Measuring the Impact of the Semantic-Based Process Mining Approach

ABSTRACT

This chapter looks at the extent to which the semantic-based process mining approach of this book supports the conceptual analysis of the events logs and resultant models. Qualitatively, the chapter leverages the use case study of the research learning process domain to determine how the proposed method support the discovery, monitoring, and enhancement of the real-time processes through the abstraction levels of analysis. Also, the chapter quantitatively assesses the level of accuracy of the classification process to predict behaviours of unobserved instances within the underlying knowledge base. Overall, the work looks at the implications of the semantic-based approach, validation of the classification results, and their influence compared to other existing benchmark techniques/algorithms used for process mining.

QUALITATIVE EVALUATION OF THE SEMANTIC-BASED PROCESS MINING APPROACH

Evidence from the design framework (SPMaAF), algorithms and experimentations show that the semantic-based approach sparks methods that highly influence and support:

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- the application of process mining techniques to the various domain processes, and
- provision of real-time semantic knowledge and understanding about the different domain processes (e.g. the case study of learning process in this book) that proves useful towards the development of process mining algorithms that are intelligent with high level of effective conceptual reasoning capabilities.

In the experimentations and implementation of the semantic-based approach (see: Chapters 6 and 7), we observe that ontologies help in harmonizing the various process elements that are found within the process models and/or knowledge-bases. Besides, the semantically-based annotations and reasoning aptitudes help to extract and add useful conceptual knowledge to the mining process and the resulting outcomes.

Accordingly, the work qualitatively applies the case study of the learning process to address the series of real-time learning questions as previously explained in chapters 5 and 6. Typically, the work resolves the learning problems in order to show in detail how the semantic-based process mining and its application in real-time has shown to be relevant to support a contextual (concepts) method for process mining and performing of abstract analysis. Therefore, the main technical development and application mechanisms or components realized as a result of implementing the semantic-based process mining approach (which included the SPMaAF framework and semantically motivated algorithms described in chapters 3 and 4 respectively) are summarised as follows:

- **Event Logs:** Used to show how the process mining techniques can be applied to improve the informative value of real-time business processes and data.
- **Process Models:** Describes how improved models can be derived from the large volumes of events (data) logs that are found within the domain processes e.g. the learning process.
- **Annotation:** Describe how semantic descriptions and representation of the deployed models can help enrich the result of the process mining and outcomes through further analysis and/or discovering of new knowledge about the different process elements.
- **Ontology:** Describes how to make use of the semantic technologies and schema (particularly an effective semantic reasoning aptitudes) to

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