

## Chapter 3

# Main Component and Architecture of the Semantic- Based Process Mining and Analysis Framework (SPMaAF)

### ABSTRACT

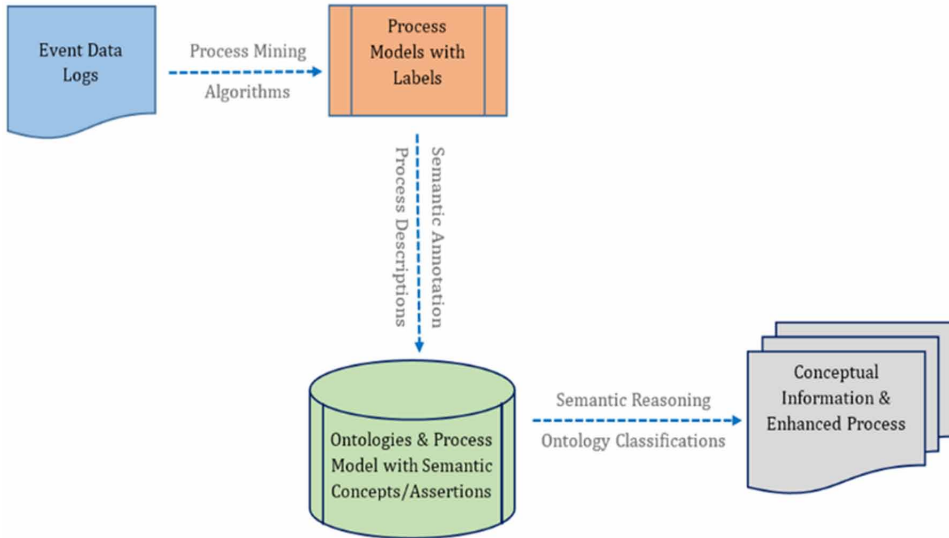
*This chapter describes the proposed semantic-based process mining and analysis framework (SPMaAF) and the main components applied for integration and ample implementation of the method. Technically, the conceptual method of analysis and how the book has designed the framework is explained in detail. The chapter also shows that the quality augmentation of the derived process models is as a result of employing process mining techniques that encodes the envisaged system with three rudimentary building blocks, namely semantic labelling (annotation), semantic representation (ontology), and semantic reasoning (reasoner).*

### SEMANTIC-BASED PROCESS MINING AND ANALYSIS FRAMEWORK (SPMAAF)

The design structure of the SPMaAF is primarily constructed on the following building blocks (or phases) as shown in Figure 1.

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*Figure 1. The Semantic-based Process Mining and Analysis Framework (SPMaAF)*



In Figure 1 the work describes the proposed framework for the semantic-based process mining and analysis method of this book (SPMaAF). Typically, the method consists of the following phases or individual components:

- **Extraction of Process Models from Event Data Logs:** Whereby the derived models are represented as a set of annotated terms that links or connects (relates) to defined terms in an ontology, and in so doing, encodes the process logs and deployed models in the formal structure of ontology (semantic modelling) for further analysis.
- **The Inferred Ontology Classifications:** Helps in association of meaning to the labels in the event logs and models by pointing to concepts (references) defined within the ontologies.
- **The Reasoner (inference engine):** Designed to perform automatic classification of the various elements or tasks, and carries out consistency checking to validate the resulting model as well as clean out inconsistent results. In turn, it presents the inferred (underlying) associations.
- **The Conceptual Referencing:** Which supports semantic reasoning over the ontologies in order to derive new information (or knowledge) about the process elements and the relationships they share amongst themselves within the knowledge base.

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