Chapter 6
Experimental Setup and Case Study Example

ABSTRACT

This chapter represents as a practical follow-up or implementation of the main components of the SPMaAF described in Chapter 5. In the experimental setup, the chapter demonstrates by using the case study of the learning process: the development and application of the semantic-based process mining. Essentially, the chapter looks at how the proposed semantic-based process mining and analysis framework (SPMaAF) is applied to answer real-time questions about any given process domain, as well as the classification of the individual process instances or elements that constitutes process models. This includes the semantic representations and modelling of the learning process in order to allow for an abstraction analysis of the resultant models. The chapter finalizes with a conceptual description of the resultant semantic fuzzy mining approach which is discussed in detail in the next chapter.

USE CASE SCENARIO OF THE LEARNING PROCESS

The case study utilized in this book is based on the running example of the Research Learning Process domain (introduced earlier in the examples given in chapters 2, 3, 4 and 5 – particularly in the beginning of chapter 5). Technically, the work makes use of the events log about the research learning process to demonstrate the real-time application and modelling of the learning

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process. This included the method applied to resolve the different learning questions/analysis problems, as well as, used in validation of the experiments.

Typically, in the case study example, the work shows that the first step to conducting a *research* is to decide on what to investigate (i.e. developing the research topic) and then go about finding answers to the research questions. At the end of the research process, the researcher is expected to be awarded a certificate. In theory, this process(es) involves the workflow of the journey from choosing the research topic to being awarded a certificate, and comprises of a sequence of practical steps or set(s) of activities through which must be performed in order to find answers to the research questions.

Indeed, the workflow for those steps are not static, it changes as the researcher travels along the research process. Besides, at each phase or milestone of the process, the researcher(s) is required to complete a variety of learning activities which are intended to help and/or directed towards achieving the research goal. Moreover, when considering the available process logs and/or from the process mining perspective; the derived process models may not disclose (or in some cases inadvertently disclose) to the process analysts some of the valuable information at the abstraction (semantic) levels, despite all of the visualizations (process mappings) from mining the said process(es). For instance, the process maps may not disclose how the individual process instances that make up the resultant model interact or differ from each other, and/or which attributes they share amongst themselves within the knowledge base, or the activities the instances perform together or differently. As a result, questions like - who are the individuals that have successfully completed the research process? may not be established. For this reason, this book shows that by adding semantic knowledge to the deployed models that it then becomes possible to determine and address the identified learning questions or problem.

To explicate such tactics, we assume that for a research process to be classified as *successful*, it is necessary that the researcher must complete a given set(s) of milestones (ranging from Defining the Topic Area –to- Review Literature –and- Addressing the Problem –and then- Defending the Solution) in order to be awarded the degree or certificate (Okoye et al, 2016), as demonstrated in the Figures 2 to 6 in Chapter 5. However, in any case, whereby the researcher has not completed the set(s) of milestones that are necessary to ensure the research outcome, the learner(s) can be classified as *incomplete*. Therefore, given such a method, it becomes possible to logically