

Data-Oriented Declarative Language for Optimizing Business Processes^{*}

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Summary of the Contribution

Business process modelling constitutes an essential and crucial task in the Business Process Management. Typically, business processes, henceforth referred to as BP, are specified in an imperative manner, which define exactly how things have to be performed. But sometimes, a BP may be exposed to different environments and subjected to many conditions in which not always a sequence of activities can be described at design time. This is the reason why several authors have proposed languages to define BP as declarative models. These declarative languages tend to be used to describe the possible execution order of the activities, allowed or prohibited, instead of the exact order of the activities.

There are a significant number of researches that detect the necessity to include the data description into the BP model. Unfortunately this effort has only been applied to imperative models, not being the declarative models the focus of the studies, more centred on the order of activities. The role of data in declarative languages has not been very relevant, mostly limited to describe the execution or not of an activity, depending on the value of a variable of the data-flow. Unfortunately, none of them is worried about a declarative description of exchanged data between the activities, and how they can influence the model.

In this work, an analysis of the declarative languages found in the literature has been made in great depth. The analysis includes an study of how the most important declarative languages address data management, by means of the formalism for reasoning that they used (Linear Temporal Logic, Event Calculus,...); the capacity to include the data perspective; and the use of the declarative languages (validation, construction and/or assistance). Thanks to this analysis, the necessity to define a new language where the data aspects take more relevant place is demonstrated. In order to solve this lack in declarative languages, we propose a Data-Oriented Optimization Language, called DOODLE, that represents graphically a declarative model which includes the BP requirements referring to data description. This new point of view of declarative languages focused on data permits to represent declaratively, the model of a business process according to

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data dependencies between the activities, and the objective function required to optimize the product of the BP in accordance to customer requirements. Compared with declarative languages, our proposal DOODLE includes data-oriented aspects in a declarative manner. It is done by means of a set of constraints that describe the data exchanged among the activities, when their relations cannot be defined explicitly at design time. Finally, DOODLE is applied to represent a motivating example: an on-line book store.