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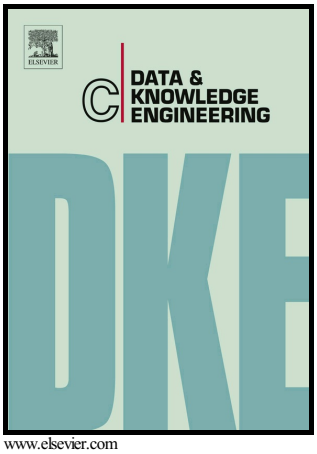

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Mining task post-conditions: Automating the acquisition of process semantics

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Abstract

Semantic annotation of business process model in the business process designs has been addressed in a large and growing body of work, but these annotations can be difficult and expensive to acquire. This paper presents a data-driven approach to mining and validating these annotations (and specifically context-independent semantic annotations). We leverage event objects in process execution histories which describe both activity execution events (typically represented as *process events*) and state update events (represented as *object state transition events*). We present an empirical evaluation, which suggests that the approach provides generally reliable results.

Keywords: business process semantics, mining post-conditions, semantic annotation

1 Introduction

A large and growing body of work explores the use of semantic annotation of business process designs [1, 2, 3, 4, 5, 6] (we use the term *semantic annotation* to describe the annotation of process designs with semantic information, and specifically, post-conditions). A large body of work also addresses the problem of semantic annotation of web services in a similar fashion [7, 8, 9, 10]. Common to all of these approaches is the idea that semantic annotation of process tasks or services provides value in ways that the process or service model alone cannot. Our focus in this paper is on *post-conditions* of tasks in the context of process models (pre-conditions are also of interest and we believe that an extension of the machinery presented here can address these, but are outside the scope of the present work). Ideally process designs annotated with post-conditions help answer the following question for any part of a process design: *what changes will have occurred in the process context if the process were to execute up to this point?* Arguably, a sufficiently detailed process model (for instance one that decomposes tasks down to the level of individual read or write operations) will require no additional information to answer this question. However, process models are most valuable when described at higher levels of abstraction,

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