Título: ON THE DEFINITION AND ANALYSIS OF PROCESS PERFORMANCE INDICATORS

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Resumen: A key aspect in any process-oriented organisation is the evaluation of process performance for the achievement of its strategic and operational goals. Process Performance Indicators (PPIs) are a key asset to carry out this evaluation, and, therefore, having an appropriate de¿nition of these PPIs is crucial. After a thorough review of the literature related and a study of the current picture in different real organisations, we conclude that there not exists any proposal that allows de¿ning PPIs in a way that is unambiguous and highly expressive, understandable by
technical and non-technical users and traceable with the Business Process (BP). Furthermore, it is also increasingly important to provide these PPI de¿nitions with support to automated analysis allowing implicit information to be extracted from them and their relationships with the BP. This information can assist process analysts in the de¿nition and evolution of PPIs, as well as in the evaluation and optimization of the BPs associated. The challenge we face in this thesis is to devise a set of techniques and tools to allow such an advanced de¿nition of PPIs and their subsequent automated analysis.
In order to face this challenge we ¿rst propose a metamodel that allows unambiguous and highly expressive PPI de¿nitions, as far as we know, it supports PPI de¿nitions that could not be expressed yet, i.e. PPIs not only

related to time or control ¿ow, supported by most existing approaches, but also those related to the state of BP elements and to the content or certain restriction of data, amongst others. Regarding the understandability, we propose a BPMN-like graphical notation and a set of templates and linguistic patterns inspired in successful approaches from the requirements engineering ¿eld. Both representations rely on the metamodel and can be automatically mapped from one to each other. Furthermore, we provide an automatic semantic mapping from the metamodel to Description Logics (DL), that allows the implementation of design-time analysis operations in such a way that DL reasoners¿ facilities can be leveraged. Finally, we have developed PPINOT Tool Suite, providing support for all these contributions, as well as the possibility to extract the information required to compute PPI values from Activiti,
an open source BP management platform.