Summary Of "Defining Process Performance Indicators: An Ontological Approach" [1]

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Business Process Management (BPM) intends to support business processes using methods, techniques, and software to design, enact, control, and analyse operational processes involving humans, organizations, applications, documents and other sources of information [2]. Many companies are taking this process oriented perspective in their business, as a way of identifying how to improve, where to increase quality, reduce waste or save time in their processes, making thus the evaluation of business processes performance a key aspect.

Performance requirements on business processes can be specified by means of Process Performance Indicators (PPIs) with target values that must be reached in a certain period. A PPI is a measure that reflects the critical success factors of a business process defined within an organisation, in which its target value reflects the objectives pursued by the organization with that business process.

In this paper, we argue the importance of integrating the management of PPIs into the whole business process lifecycle [3, 4] and propose to do it as follows: in the design and analysis phase, PPIs should be modelled together with the business process. Furthermore, this model of PPIs should also enable their analysis by detecting the dependencies amongst them at design time and also using them as part of the business process analysis, for instance in business process simulation techniques. During the configuration phase, the instrumentation of the processes that are necessary to take the measures must be defined. During the business process enactment, when valuable execution data is gathered, the PPIs' values have to be calculated and the monitoring of these PPIs should be carried out. For instance, this can be done based on execution logs that store information about the process such as the start or end of activities. Finally, during the evaluation phase, the monitoring information obtained in the previous phase will help to identify correlations and predict future behaviour.

Handling business processes and the aforementioned PPIs lifecycle is recognized as an error-prone and time-consuming activity which requires of automated support. Current research efforts in the automated treatment of business processes mainly focus on the analysis post-mortem applying technics as process mining. These operations allow us to observe the properties of the process models and extract information about them after their enactment. However, although there are several research proposals to define PPIs, none of them are well-suited because they cannot express commonly used PPIs or they are not ready to enable a design-time analysis of PPIs or they do not define explicitly their relationship with the business process and, hence, make it difficult their use together with business process analysis techniques. Thus, the definition and automated design-time analysis of these PPIs still prevail as open research issues.

To overcome this issue, we present an ontology to define PPIs whose main benefits can be summarised as follows: 1. The relation between PPIs and the business process is explicitly established. This enables the use of PPIs together with other business process analysis techniques and helps in the instrumentation of the information systems that is necessary to obtain measures automatically. 2. It supports the definition of a wide variety of PPIs, including those associated with data objects. It also supports the definition of an expressive analysis period of a PPI. In fact, our ontology supports the definition of PPIs that, as far as we know, cannot be expressed in any other similar proposal. 3. Dependencies between ProcessMeasures and InstanceMeasures can be automatically obtained from the ontology, which enables the analysis of PPIs at design time. Furthermore, since the ontology has been defined in OWL DL, automated reasoners can be used to make queries about the PPI model such as how many PPIs are defined on the same MeasureDefinition? Or how many PPIs are defined on a TimeMeasure?

Furthermore, we have validated the suitability of the ontology for the definition of real PPIs by using several real scenarios in different environments (the Information Technology Department of the Andalusian Health Service and the Justice and Public Administration Department of the Andalusian Local Government), in order to prove the applicability of our solution to actual scenarios. These real scenarios and the corresponding definitions of PPIs using our ontology can be found at `http://www.isa.us.es/ppiontology/`

References

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