

ASIO: a Research Management System based on Semantic technologies

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Abstract. In this paper we describe the architecture of a Research Management System based on Semantic technologies. The system is composed from two main modules: ontological infrastructure and research management system which are communicated through an RDF triple store that integrates all the information. The data model is defined in terms of Shape Expressions which are synchronized with Java entities that define the data model. The shapes also act as core layer that can be used to describe the main entities that will be employed and to validate their ontological definitions with test data. In this way, we propose a test-driven development approach for ontological engineering that improves the quality of both the ontologies defined and the data. The semantic architecture is based on a reactive approach which combines both a clean architecture and a stream-based pattern. This paper describes the architecture of the system and the main quality attributes and design decisions that have been taken into account.

Keywords: research management, semantic technologies, linked data, ontology, stream processing, shape expressions

1 Introduction

There is an increase interest in the development of Research management systems which improve the available services for both researchers, research administrators and citizens in general. However, representing scholarly information is a complex task which requires to take into account the differences between disciplines, the decentralized nature of research advances and collaborations, as well as the increasing amounts of research data that are generated and need to be collected and taken into account. Although several approaches have tackled this problem promoting the use of linked data and semantic web technologies there is still a need to develop research management systems which are adopted by the different institutions and easily integrate their data models.

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