Semantic Web Research Inspired by W3C Standards, or the Hell of the Practice without Theory⋆

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Abstract. The Semantic Web is the initiative of the World Wide Web Consortium (W3C) to make information on the Web readable not only by humans but also by machines. RDF is the data model for Semantic Web data, and SPARQL is the query language for this data model. RDF and SPARQL are the output of long standardizations processes led by the W3C. These processes, usually in charge of developers, are not always open to consider researchers opinions on the theoretical implications of the design decisions in terms of computational complexity, logical expressiveness, etc. In this tutorial, we survey some of the key aspects of SPARQL and RDF from a database perspective. We put emphasis on the experience of our Database Theory group (at PUC-Chile and UChile) dealing with W3C standardization processes, and how the work of this group has been influential not only in the theory but also in the practice of RDF and SPARQL. We focus on the normative semantics of SPARQL 1.0, that follows closely the proposal of our group, we introduce some navigational extensions for the language, and we discuss on the interplay between SPARQL and Open Linked Data. We also present some important recently published issues that we have discovered in the upcoming SPARQL 1.1 specification that may severely impact on the adoption of the new standard.

⋆ The material surveyed in this tutorial is part of a joint work with Marcelo Arenas and Sebastián Conca from PUC-Chile, and Claudio Gutierrez from Universidad de Chile.