Reviewer’s report

Title: QL4MDR: A GraphQL Query Language for ISO 11179-based Metadata Repositories

Version: 0 Date: 16 Dec 2018

Reviewer: Jürgen Stausberg

Reviewer's report:

The authors present a technical description of QL4MDR, a query language for metadata registries that implement the metamodel of the ISO/IEC 11179. With QL4MDR, the authors combine an implementation of the ISO/IEC 11179 called Samply.MDR with GraphQL, a generic query language. As far as the reviewer understands, the authors configured GraphQL for the core metamodel of ISO/IEC 11179 and add a respective API to Samply.MDR. In the discussion, the authors focus on the comparison of GraphQL with the REST-approach. Unfortunately, the authors did not include any information about requirements and methods. They fail, if they regard ISO/IEC 11179 as "lowest common denominator". In the contrary, ISO/IEC 11179 can be seen as an all-in-one solution, offering a complex and powerful model for metadata registries. The strengths and weaknesses of ISO/IEC are not really understood in the scientific literature. Therefore, it would be very important to provide information about the benefits but also about the limitations of GraphQL in respect to ISO/IEC 11179. For example, figure 1 draws lines between some classes of ISO/IEC 11179 without giving any semantics. The Conceptual Domain - a not very well understood class of ISO/IEC 11179 - is missing. Figure 2 denotes Data Element Concept as "concept". However, also the Conceptual Domain is a concept in ISO/IEC 11179. A major obstacle for querying ISO/IEC 11179 implementations is the variety of possible representations for the same piece of metadata. For example, the variable "heart failure" can be represented as property of an object "patient" with the permissible values "yes" and "no". But "heart failure" can also be represented as permitted value of an object "patient" with the property "disease". A query language that can deal with different representations without explicit knowledge about the options would be very helpful. This could be one strengths of QL4MDR. Furthermore, "heart failure" could be represented as an object with the property "Existence". ISO/IEC 11179 offers the Concepts Metamodel Region for relationships between those different levels of representations. Therefore, a query language should also make use of the Concepts Metamodel Region as well. In summary, the objective of the paper is very important: to make metadata available and to make metadata registries valuable. However, the reviewer recommends some additions to improve the paper. The technical description provided by the authors should be supplemented by a) a list of predefined requirements, b) a description of the formal rules that guided the authors in their implementations ("methods"), and c) some examples that convince the users from the capabilities of the achieved solution.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No
Does the work include the necessary controls?
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No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

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