Author’s response to reviews

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

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Hasan Jamil (Reviewer 1):

While the idea of the research is interesting from a data integration standpoint, the authors did not provide enough motivation.

We revised the whole background section and added a conceptual graphic to clarify our motivation.

They will also need to establish novelty by comparing their system with similar research prototypes. The related research section is truly poor. It was at all not possible to fish out the benefits and novelty of the system proposed.

We revised this section by adding a related standard, discussed related work within the background section and compared our technical solution within the discussion.

Julian Varghese (Reviewer 2):

1. It is not written if or how the interface makes use of semantic codes, which are key to solve semantic interoperability problems. That is, the queries must take into account semantic coding
via reference terminologies (eg. Snomed-CT) to identify the common or similar medical concepts behind different metadata definitions.

We improved the second graphic to show an example use of semantic codes, as well as described how the codes can be used to query the MDRs by querying the slot entity.

2. It is not clear to me if the authors really address their key motivation by using an interface language.

As mentioned above, we rewrite the background section to clarify our motivation.

3. Currently all three figures are not very informative, since they do not help in understanding the key problem of heterogeneous metadata definitions, neither do they illustrate new results

We novated the first graphic to amplify our motivation and modified the second graphics with an exemplary query. Additionally, we improved and refined the captions.

Reference no. 10 lacks information on publisher, I guess its Stud Health Technol Inform.

We corrected this reference.

Jürgen Stausberg (Reviewer 3):

They fail, if they regard ISO/IEC 11179 as "lowest common denominator".

We rephrased the results section to clarify our intensions.

Figure 2 denotes Data Element Concept as "concept". However, also the Conceptual Domain is a concept in ISO/IEC 11179.

We corrected this mistake and added the missing designator “Data Element”.

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 strength of QL4MDR.

We thank the reviewer for meaningful contribution to our approach. We will consider this idea in the next steps. This study aims on the syntactical metadata integration and most of all the technical provision. We renovated our description of the key motivation to clarify our interest.
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.

We clarified our motivation and scopes to point out which MDR systems we are addressing. Further, we described our proceeding in the results part, since a BMC software manuscript does not include a method section. The third figure described a use case and shows the technical advantages compared to common approaches.