Evaluation Guideline

These instructions guide the evaluation of the experimental results produced during the requirements quality impact study.

Procedure

The experimental data (domain models) must be translated to numerical data. Only requirements 2-5 are relevant to translation, as requirement 1 of the experiment is the warmup object. The translation takes the following steps:

1. Create one new row for each of the four experimental objects that a participant worked on. Set the value of the column PID (= participant identification) to the 4-digit code, which constitutes the prefix of the GoogleDoc containing the results.
2. Fill the value of the column RID (= requirements identification) with the order of the four experimental objects. This order can be found in the Experiment Participants sheet in the Config column.
3. For each requirement, determine the number of issues (see below) in the submitted domain model.

Data Extraction

Model Elements

We expect that a submitted domain model contains the elements (entities and associations) determined in the ground truth of experimental objects (either exactly or semantic equivalents).

Semantic equivalents

Semantic equivalents are accepted in place of exact elements. These include:

- Entities with semantically equivalent names.
- Associations with semantically equivalent types.
- Associations with reversed edge direction but also reversed types (e.g., “a -creates-> b” is semantically equivalent to “b -is_created_by-> a”)

Issue types

Every deviation from the ground truth that is not semantically equivalent counts as an issue of the following types:

- **Missing entity**: An entity in the ground truth has no semantic equivalent in the submitted domain model.
- **Too-coarse entity**: An entity in the submitted domain model represents two or more entities in the ground truth.
- **Superfluous entity**: An entity in the submitted domain model has no semantical equivalent in the ground truth.

- **Missing association**: An association in the ground truth has no semantic equivalent in the submitted domain model.
- **Miswired association**: An association in the ground truth has a semantic equivalent in the submitted domain model, but either the target or the source of the association is incorrect.
- **Superfluous association**: An association in the submitted domain model has no semantic equivalent in the ground truth.