

Introduction

Poor EMR usability is an obstacle to EMR adoption [1]. Usability includes: functionality, user satisfaction, sequences of tasks, etc.

NIST Meaningful Use Cases (MUC) [2] are approved test procedures developed for evaluating EHRs for an initial set of standards, implementation specifications, and certification criteria

TURF [1] (previously UFuRT) captures functionality as part of usability while providing:

- A theory for describing, explaining, and predicting usability differences
- A method for defining, evaluating, and measuring usability objectively
- A process for designing built-in good usability
- A potential principle for developing EHR usability guidelines and standards

Purpose of this study

- Demonstrate an concept integration process to:
 - Extract key MUC concepts from NIST test procedures and fit to a TURF model
- Serves as the bridge between NIST test procedures and usability evaluation that will guide Meaningful Use oriented usability evaluation

Methods

Topic coding is the qualitative analysis method used in this research [3]

- Assigned topics from TURF model for:
 1. User topic
 2. Function topic
 3. Task topic
 4. Representation topic
- Extract concepts from NIST meaningful case '§170.302 (b) Drug-formulary checks'
- Map NIST concepts to the topics under TURF model using Topbrad [4]
 - Generate TURF ontology schema
 - Populate test procedure concepts under TURF schema

Selected view of TURF result

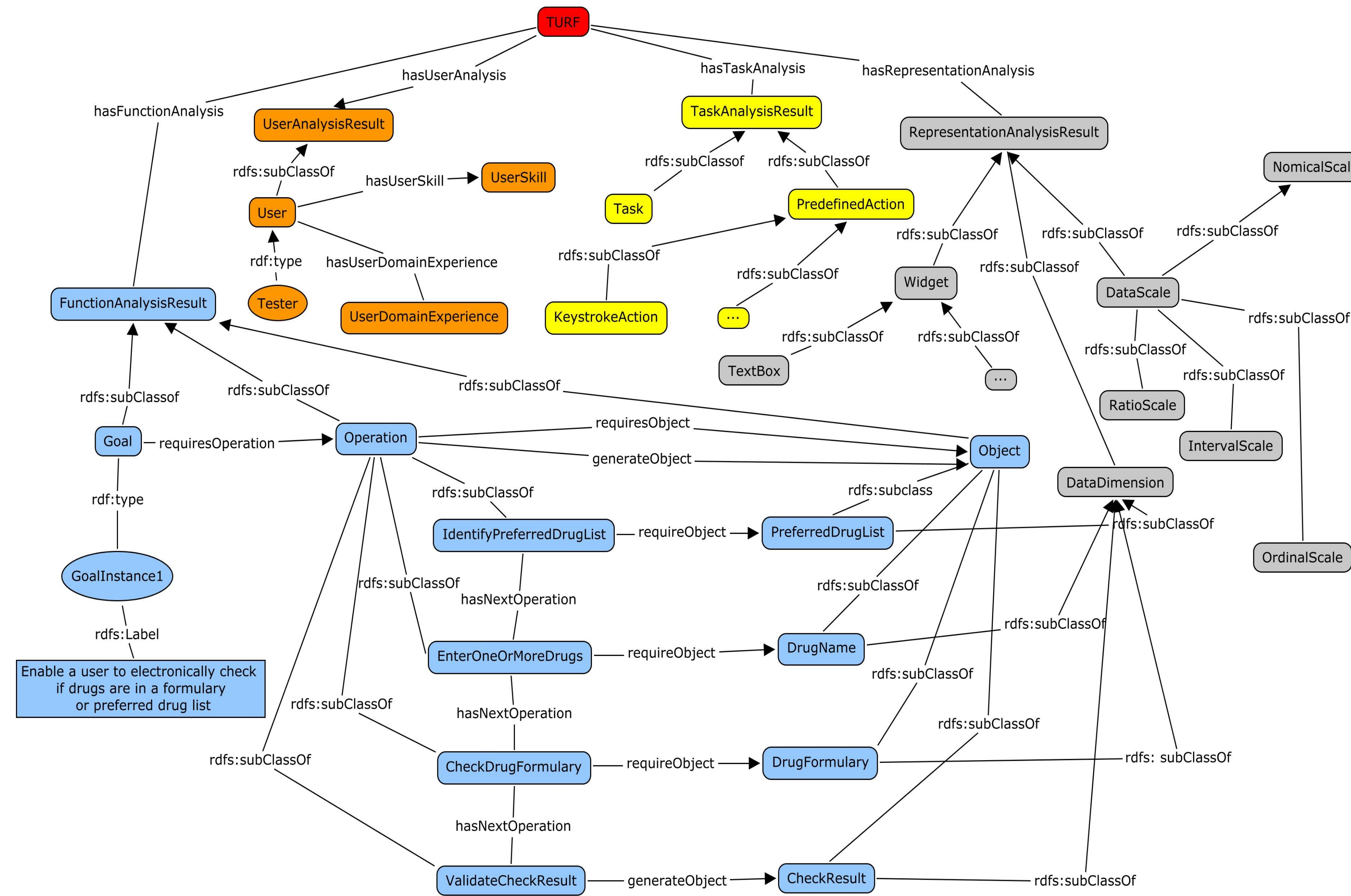


Figure 1. This figure presents the preliminary modeling result.

Legend: **User**, **Function**, **Task** and **Representation**
 Rectangle = class; ellipse = instance; Arrow = relationship between concepts in OWL

Summary of Conclusions

In this pilot project, we demonstrate the efficacy of extracting and inserting the concepts from NIST test procedure into a TURF model.

Future Directions

- Iterative processes are still needed to further validate TURF model.
- Concepts from other NIST test procedures will be extracted and inserted into TURF model.
- Concepts from EHRs will be extracted to fill in the implementation details in TURF's task and representation topics.

References

1. Zhang, J., & Walji, M. F. (2011, in press). TURF: Toward a unified framework of EHR usability. *Journal of Biomedical Informatics*, 00, 1-000.
2. NIST approved test procedure: available at: healthcare.nist.gov/use_testing/index.html
3. Approaches to Coding in NVivo 7: available at gsrinternational.com/support_resource-articles_detail.aspx?view=121
4. Topbrad: available at topquadrant.com/products/TB_Composer.html

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