SNOMED CT: Ontologies in support of global interoperation of the EHR SNOMED CT Showcase

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Learning Objectives

- Define “Interoperability”
- Understand how the SNOMED CT concept model supports interoperability with attention to Clinical findings, Observable entities, Pharmaceutical products and Substances
- Explore the concept model in service of interoperation of data coded with Australian Medical Terminology, RXNORM, LOINC and NPU
- Identify important use cases for interoperation of electronic health record data from problem list, allergies, medication management and testing results
- Understand how to use the concept model for use cases in clinical care, research and epidemiology

Disclaimer

- Respect the intellectual property of standards development organizations: SNOMED CT®, Australian Medications Terminology(AMT®), RXNORM®, LOINC®, IUPAC/NPU®
- OWL developments for LOINC, RXNORM and NPU are NOT supported at this time for general release
- Workshop content and discussion does NOT represent official opinions of SNOMED International, NLM, Australian Digital Health Agency, IUPAC or LOINC
- The authors accept all responsibility for discussion and such blunders and mistakes that might be made during these two sessions

OWL Demonstration File

- As an ancillary to these sessions, we are making available an OWL rendition of SNOMED CT supplemented with RXNORM and Australian Medications Terminology(AMT)
- Available on request from OB
- Instructions follow on how to obtain the OWL file and install Protégé for experimentation of your own

Technical Requirements for Protégé©

- Laptop: 16GB RAM, (solid state memory)
- Protégé 5.5.0 (Xmx>=8GB(16GB), Xms>=2GB, Xss300MB)
- UMLS license available at https://uts.nlm.nih.gov/home
- OWL files for SNOMED CT®, RXNORM, AMT® (440MB)

How to get SNOMED CT OWL for your work

- Contact UMLS or your National Release Center for the RF2 Files of the latest release
- Obtain the SNOMED-OWL toolkit from https://github.com/IHTSDO/snomed-owl-toolkit
- The conversion utility is well documented and runs directly on the compressed RF2 file set
- OWL file is about 180MB and will include any ancillary files from your NRC. In US, UK-en, US-en and Spanish translations are included

Workshop Resources

- Use case demo: Anonymized CDA record summary (CDA_anonymized_record_summary.zip)
- CDA Coded data inventory included
- SNOMED CT Editorial Guide 20190129
- Draft description logic queries for Protégé / OWL description logic exercises

Interoperation Use Case

- US tourist in Australia stricken with acute febrile illness presents to local physician, providing a CDA record summary to the physician for medical history.
- October 31 Session 1:
  - What are the current meds for refill in Australian Medical Terminology?
  - Is the patient on any immunosuppressants?
  - …any antibiotics?
  - …any medication allergies?
- November 1 Session 2:
  - What are the patient's problems?
  - Does the patient have history of infections?
  - Is the patient allergic to planned treatment?
  - Has the patient had a low white count?
  - Is the patient being monitored for an immunosuppressant?
  - Is the diabetes under good control?
  - Has the patient been screened for diabetic kidney disease?

Interoperation Use Case

- US tourist in Australia:
  - What are the current meds for refill in Australian Medical Terminology?
  - Is the patient on any immunosuppressants?
  - …any medications that raise blood sugar?
  - Has the patient had a low white count?
  - Is the diabetes under good control?
  - Has the patient been screened for diabetic kidney disease?

Semantic Interoperation

Describes the features of healthcare information system design whereby information that is captured and stored in one Electronic Healthcare System can be exchanged with unambiguous, shared and computable meaning. It is a requirement to enable machine computable logic, inferencing, analytics, knowledge discovery, and data federation between systems. In short, the vision of Artificial Intelligence requires interoperation.

Workshop Thesis

- In this workshop we will explore use cases exploiting the SNOMED CT concept model -
  for Clinical findings, Substances, Pharmaceutical-Biological Products and Observable entities -
  to promote interoperation between domain ontologies/reference terminologies in the context of the EHR

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