Drug Encyclopedia

A web application for physicians containing clinically relevant information about drugs and medicinal products.

Integrated data source

Built on the top of a triple store.

Has been running for almost two years.
Requirements and Data Sources

- We went out and made a survey.
- Results show that physicians want:
  - a nice and well-arranged application about drugs,
  - to search for basic information, i.e., indication, contraindication, adverse effects,
  - to read through summaries of product characteristics,
  - check for potential drug-drug interactions…
- Selection of data sources was driven by the requirements
  - Local drug data, MeSH, NDF RT, DrugBank, FDA Labels…
Data ETL Process

Data sources → Data sets → Data sets & Link sets → Data mart
Data Mart

- Optimization
  - Application ontology
  - Entities unification
  - Path shortening
Application Introduction

- Web application built on the top of a triple store.
- Each click triggers a SPARQL query which is evaluated in the triple store.
- Features:
  - Search and browse – active ingredients, medicinal products, ATC groups, diseases…
  - Check for potential interactions
  - Display SPC – read through texts with annotations
  - Search for alternative medicinal products
http://www.lekovaencyklopedie.cz/en
Search Feature

- Basic function, SPARQL query
- Multilingual – all languages are searched
- Autocomplete after 4 letters written
- Different search strategy for each class
Detail

- Visual templates applied
- No need to change app when data changes
- Easy data browsing
Interaction Check

Information integrated from several sources including information extracted from texts (summaries of product characteristics).

Found interactions

- Ibuprofen
- ATORVASTATIN STADA 40 MG
- Warfarin

Find interactions

Ibuprofen, a strong CYP2C9 inhibitor, may decrease the metabolism of warfarin. The antiplatelet effect of ibuprofen may also increase the bleed risk associated with warfarin. Consider alternate therapy or monitor for changes in the therapeutic and adverse effects of warfarin if ibuprofen is initiated, discontinued or dose changed. (zdroj: drugbank)

Antikoagulancia: NSAIDs mohou zesílit účinky antikoagulancí, jako je warfarin (viz bod 4.4). (zdroj: cz-sukl)

Critical interaction (zdroj: ndf-rt)
Usage Statistics

- Data collected via Google Analytics
- Time period – 01/2014 – 09/2015

- 3500 unique users
- 57% returning users
- 37% came more than 9 times
Lessons Learned

- Users shouldn’t know there is a triple store – because they doesn’t care.
- Main advantages and risks of the Linked Data are on the side of developers.
  - Both data maintenance and application development.
  - No schema is a great benefit (but also a risk).
  - New data sources can be added easily.
**Last remark**

- RDF and SPARQL can be used in the production phase of an application.
- Application data mart is a good thing.
- Do you know about any other applications?
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