Adopting Semantic Technologies in Public Health Documentation

Joffrey Decourselle and Frédéric Riondet

progilone
innovative technologies

Hospices Civils de Lyon
Lyon University Hospital

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Introduction

Knowledge extraction

Catalog

Graph of advanced bibliographic relationships

Our expertise:

➢ Automatically migrate catalogs of records into knowledge bases
➢ Provide a full Integrated Library System to manage KBs: Syrtis
Migrating a public health catalog (HCL) into a knowledge base!

- **500,000** records
- Multiple **advanced** patterns
- At least **25,000** users (directly concerned)
- **15** librarians working on the catalog
- At least **1000 visits / month**
Existing solutions

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Existing solutions

- Normalization / deduplication
Motivation

Statistics on **Quality Errors** from three FRBRisation tools … from the **Benchmark BIB-R** (http://bib-r.github.io/)

![Graph showing statistics on Quality Errors for FRBR-ML, VFRBR, and XC tools.](image-url)
Challenges

Challenges for the FRBRization process:

- **Migration of advanced knowledge**
  - Bibliographic Families

- **Efficient process**
  - Scalability on large catalogs
Our approach

- Modelling reusable advances knowledge patterns and views on the records
- Create + export model in RDF + Implementation in a migration tool
- Optimization mechanisms -> Efficient FRBRization
### Example 1

<table>
<thead>
<tr>
<th>Work (Journal)</th>
<th>Realization</th>
<th>Manifestation</th>
<th>Edition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work (Article)</td>
<td>Realization</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Example 2

011 $a 0899-823X
101 $a eng
200 $a Evolving epidemiology of Staphylococcus aureus bacteremia
   $b article
   209 $a 36 $b 12
   210 $d 2015/12
   463 $t Infection control and hospital epidemiology $x 0899-823X
   610 $a Epidemiology
   700 $4 070 $a Rhee $b Y.
   $p Infectious Diseases, Rush University Medical Center, Chicago
   700 $4 070 $a Aroucheva $b A.

101 $a eng
200 $a An urban school based comparative study of experiences [...] for their children.
   $b article
   209 $a 3 $b 11
   210 $d 2009/06
   463 $t Journal of immigrant and minority health
   606 $a Hospital
   700 $4 070 $a Rhee $b Y.
   700 $4 070 $a Belmonte $b F.
   700 $4 070 $a Weiner $b S.

Work createdBy 0,n Person
Work createdBy 0,n Work
Work createdBy 0,n Scientific Agent
1,1 Scientific Agent Affiliation
Person createdBy 0,n Person
Person createdBy 0,n Work
Scientific Agent createdBy 0,n Work
Scientific Agent createdBy 0,n Person
Scientific Agent createdBy 0,n Affiliation
Affiliation createdBy 0,1 Person
Creating the whole model

- 90 distinct patterns including approx. ~500 mappings
- Full process last ~45min (including normalization/deduplication time)
Experiments with our approach

Statistics on **Quality Errors** with the **Benchmark BIB-R**

![Graph showing quality errors comparison between different methods](image-url)
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Syrtis : description of a Work

https://rbh.docchu-lyon.fr/

We Underdose Antibiotics in Patients on CRRT
Shaw, Alexander R, Chaijarnorn, Weerachai, Mueller, Bruce A
Genre du document : Editorial Opinion Interview Lettre
SyrtisID : 904452

Résumé : Appropriate antibiotic dosing in critically ill, infected, patients receiving continuous renal replacement therapy (CRRT) is crucial to improve patient outcomes. Severe sepsis and septic shock result in changes in pharmacokinetic parameters, including increased volume of distribution, hypoalbuminemia, and changes in renal and nonrenal clearances. The lack of CRRT standardization, nonrecognition of how CRRT variability affects antibiotic removal, fear of antibiotic toxicity, and limited drug dosing resources all contribute to suboptimal antibiotic therapy. Even when antibiotic CRRT pharmacokinetic studies are available, they are often based on old CRRT methodologies that do not exist in contemporary CRRT practice, resulting in
Soon: new graph description
Ongoing Works

- Integration of advanced knowledge from external sources
- Semantic Search (based on thesauri-records alignments)