Strasbourg IHU Knowledge Base: a CERIF implementation

CRIS2016 conference

Valerie Brasse and Laurent Remy

11th of June 2016, St Andrews
Stakeholders

Institut Hospitalo-Universitaire = teaching hospital institute
- Scientific cooperation foundation (public and private partners)
- Digestive diseases
- Minimally invasive technologies
- Latest advances in medical imaging
- New concept of hybrid surgery room

Information System 4 Research & Innovation
- Support the design, development, integration and use of information systems
- Contribute to advancement of research and innovation
The project

Issues
• No centralized repository
• Unknown amount of unstructured information
• No tool to share information efficiently

Interviews
• Identified user/employee’s profile
  • External start-ups
  • Surgeons
  • Software development engineers
  • Etc.
• Interview (x2)
Previous issues
+ Specific requirements
  • Need for market information! (Pathologies + procedures)
  • How to find the right expert?
  • How to identify the [internal] information holder?
  • What is going on internally?
  • What is going on in the field of minimally invasive surgery?

+ Technical requirements
  • Central authentication + Single-Sign-On
  • Local infrastructure integration
Designing a solution

Knowledge base
• Structured data
• Link between data
• Semantics
• Search engine + facets

Market watch
• Identified relevant sources
• Information to be qualified and sorted

Social networking
• Commenting contents
• Sharing content
• Interacting with medtech stakeholders
CERIF as a data model

- Experts
- Person
- Market studies
- Indicators & measurements
- Publications
- Publications
- Projects
- Projects
- Patents
- Patents
- Instruments
- Equipments
- [medical] Procedures
- Products
- Companies
- Organisation Units
- Pathologies
MeSH for semantics

MeSH Tree Structures - 2016

1. + Anatomy [A]
2. + Organisms [B]
3. + Diseases [C]
4. + Chemicals and Drugs [D]
5. + Analytical, Diagnostic and Therapeutic Techniques and Equipment [E]
6. + Psychiatry and Psychology [F]
7. + Phenomena and Processes [G]
8. + Disciplines and Occupations [H]
9. + Anthropology, Education, Sociology and Social Phenomena [I]
10. + Technology, Industry, Agriculture [J]
11. + Humanities [K]
12. + Information Science [L]
13. + Named Groups [M]
14. + Health Care [N]
15. + Publication Characteristics [V]
16. + Geographicals [Z]

Medical Subject Headings

Branches:
- Anatomy [A]
- Diseases [C]
- Analytical, Diagnostic and Therapeutic Techniques and Equipment [E]
- Information Science [L]
The platform

Natively includes
- Web content management
  • Customatization
- Documents and Media management
- Vocabularies management
- Fully integrated search engine
- Social networking features
- Large variety of standards
- Framework for local+remote services
- APIs
Proof of Concept

Knowledge base
• Liferay web content management
  • Customization
  • MeSH semantics integration
• Integrated concepts
  • Instruments
  • Patents
  • Companies
  • Procedures
  • Pathologies
  • A few indicators
• Facetted search engine

Social networking
• Comments
• Forum

Market watch
• Not in the scope of the PoC
• Use of Liferay’s APIs (development to be done)
Proof of Concept

Problems faced
• Assets can be linked, but lack of semantics
  • Web content management does not fulfill our needs
• MeSH categories too wide

Conclusion
• Integration of a CERIF layer for the knowledge base
• Use of sub-trees of MeSH categories
CERIF basic mechanisms

- Entities + relation-entities
- Time-based relations
- Multilingual capacity
- Semantic layer
Overlap between CERIF and Liferay features.

**Multilingual capacity**
- Liferay provide this mechanism for all type of contents
- This mechanism is integrated with the platform and/or user language selection

**Semantics**
- Liferay provide vocabularies management
- These vocabularies are shared by all type of contents of the platform
- These vocabularies are also fully integrated as facets in the search engine
Knowledge base web-platform
- Structured content (CERIF compliant)
- Categorized content
- Search capacities
Market watch

- 6 sources harvested
- Manually qualified and added to the knowledge-base
- Daily harvesting
### Social networking

- **Rating**
- **Commenting**

### Procedure-Technique interventions

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Number Of Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>2015</td>
<td>27</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>2014</td>
<td>22</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>2013</td>
<td>63</td>
</tr>
</tbody>
</table>

### Procedure-Technique used for the following pathologies

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Number Of Cases</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>test pathos</td>
<td>180000</td>
<td>18.5</td>
</tr>
</tbody>
</table>

### Related Assets:

- Endometrial cancer in elderly women: Which disease, which surgical management? A systematic review of the literature.

**Your Rating**

Average (1 Vote)

**Add Comment**

My first comment

Laurent REMY
Next steps

Knowledge base
• Add non-integrated concepts
  • Experts
  • Projects

Market watch
• Metrics
• Identify new sources
• Text mining

Social networking
• User profiling
Questions

Laurent REMY
lremy@is4ri.com