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Semantic enrichment of research outputs metadata:

New CRIS facilities for authors
New class of CRIS: SE CRIS

<table>
<thead>
<tr>
<th>Semantic linkage model</th>
<th>Traditional CRIS</th>
<th>Semantically Enrichable CRIS</th>
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<td>CERIF model: IDs of linked objects, semantic meaning and dates of the linkage validity</td>
<td>Added attributes to have the linkage as a separate interoperable entity: own ID, linkage direction, anchoring (e.g. for annotation), and a comment</td>
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<tr>
<td>Enter the ID of one linked object into metadata of another linked object with some semantic meaning</td>
<td>CRIS users can make linkages between any two objects, assign available taxonomy value and submit it to the CRIS administrator or use it privately</td>
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<td>When CRIS displays an object metadata, it replaces ID of another objects on its names with hyperlinks</td>
<td>Displaying an object the CRIS shows all outgoing and ingoing linkages of the object with its specific processing and anchoring</td>
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<td>?</td>
<td>Notifications, scientometrics, taxonomy management, etc.</td>
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Entities/objects and semantic linkages
(initial slide by Keith Jeffery)
Requirements to CRIS and its users

- A user must have a login to the CRIS, i.e. the system should have some users’ identification service
- A user must have a personal profile connected with CRIS identification service
- A user’s personal profile has to be linked with user publications available at CRIS content
Our test bed for experiments

- Research information systems:
  - Socionet CRIS (socionet.ru)
  - +RePEc data (repec.org)
  - +RePEc Author Service users (authors.repec.org)

- Total number of available research information objects – about 2.5M and 8M of semantic linkages

- Total number of users that meet requirements – about 40K real people
User interfaces for creating linkages

- The first interface creates a linkage from a user personal profile to a browsed paper.

- The second creates a linkage from a user paper selected by him at the list to a browsed paper.
Use cases (1)

1. If you have co-authors you can specify your roles in making collective research outputs. The idea of such facility and initial taxonomy of author roles came from the Nature commentary (http://www.nature.com/news/publishing-credit-where-credit-is-due-1.15033) and from the CRediT project (credit.casrai.org) led by The Wellcome Trust, Digital Science, CASRAI, NISO and Science Europe.

2. You can make some actualization of your publications. It can be done by two ways:
   1) by annotating text fragments of a publication abstract to provide for readers additional and/or newer information on the topic; and
   2) by linking to the publication its newest versions, related papers appeared after its publishing, etc.

3. You can visualize for readers an evolution or a development through a set of your publications of some ideas, approaches, etc.
4. You can visualize for readers how certain materials from a reference list of your publication were used by you in producing this research output.

5. You can make recommendations for and/or to share useful information with registered authors whose publication you currently reading in your browser. In this case your proposal will look as a linkage with some taxonomy between some of your publications and the currently reading one.

6. You can visualize research relationships and associations between your publications and publications of other authors.

7. You can express publicly your professional opinion about a publication of other authors by using some specific taxonomy.
Links for demonstration

- [http://sparinov.wordpress.com/](http://sparinov.wordpress.com/) - detailed instructions with screenshots
Open repository with input/output by FTP, OAI-PMH, REST API and based on the CERIF format:

- All public semantic linkages
- All semantic vocabularies presented currently used scientific relationships taxonomy

Communications among authors and users of authors’ research results by different scenarios

Everyday updated scientometrics based on the semantic linkages data, including aggregated indicators for each authors and research organizations
SE CRIS challenge for the research community

- Researchers get a new instrument for more efficient “long distance” cooperation (zone C)
- An author gets immediate signals when someone used their research results
- As a feedback to the user:
  - an author can help the user with better using of the author’s research results
  - an author can improve/develop his research results in order to the user gets better effect
Global research cooperation: traditional vs. based on SE CRIS

- Select artifacts
- Analyze, manipulate and make relationships between artifacts
  - Articles
  - Publishers
- Read materials
- Articles, books, citations, references, etc.

Researchers get from SE CRIS signals about creation of artifacts and relationships

Researchers put own artifacts into SE CRIS and create relationships between all available artifacts
Conclusion

We are developing the SE CRIS approach for modernization of the research process, including

- More efficient research communication, interactions and coordination for large-scale communities
- New scientometrics and better professional signaling system
- Better research assessment and evaluation
References

❖ RePEc blog - http://blog.repec.org/
❖ Start page with links to instructions –
   ❖ http://sparinov.wordpress.com/2014/11/16/new-authors-ecosystem-at-socionet/
❖ Contacts – Sergey Parinov, sparinov@gmail.com