Perspectives for development of the Croatian Research Information System CroRIS

Prof. Damir Kalpić, PhD

Primošten, Croatia, 2018
Introduction

- **State as-is in Croatia**
  - Sets of bibliographic data
  - Bibliographic data standards
  - Current local Croatian scientific production databases
  - Current global scientific production databases
  - Local information loading and updating from local and global databases

- **State to-be in Croatia**
  - Unified collection of Croatian scientific production data
  - Presentation and attribution of Croatian scientific production data
  - Features of the IS to be developed
  - Prerequisites for self-sustained existence
CroRIS Information system development (1)

- Part of the project *Scientific and Technological Foresight*
- Co-financed by the European Regional Development Fund (ERDF)

Logos in Croatian:

Principal developer & Project leader¹
- Ognjen Orel, Ph.D.

Consulting²
- Main consultant:
  - Prof. Vedran Mornar, Ph.D.
- Consultants:
  - Prof. Damir Kalpić, Ph.D.
  - Prof. Mirta Baranović, Ph.D.

¹ University of Zagreb University Computing Centre
² University of Zagreb, Faculty of Electrical Engineering and Computing, Department of Applied Computing
CroRIS Information system development (2)

- Conceptual solution
- Specification of requirements
- Data model
- User interface
- Connection to bibliographic services
- Data interchange protocol
- Reporting
- Requirements management
- Matching of user requirements and offers
- Future developments
State as-is in Croatia (1)

- Software support to scientific activities and higher education has been in variable focus
- Islands of computerisation
  - Institute Ruđer Bošković
    - *Croatian scientific bibliography* (CROSBI)
  - Faculty of Electrical engineering and computing (FER)
    - Example for local replication (FER-ZPR)
State as-is in Croatia (2)

- Portal of scientific journals of Croatia – *Hrčak*
- Full-text Institutional Repository of the *Ruđer Bošković* Institute – FULIR
- DABAR (in Croatian; acronym of the Croatian name *Digitalni akademski arhivi i repozitoriji* meaning *Digital academic archives and repositories*)
- Šestar (in Croatian) Data base of instruments for scientific research
- University of Zagreb School of Medicine Repository
- University of Zagreb Faculty of Humanities and Social Sciences Institutional Repository
- …?
Internationally accepted formats (1)

- Common European Research Information Format (CERIF)
Internationally accepted formats (2)

• States publicly support research programmes
  • public sponsorship for wealth creation and improvement in the quality of life
  • appropriate governance
  • information available to the public

• Research process
  • strategic planning
  • programme announcement
  • call for proposals
  • proposal evaluation and awarding
  • project result monitoring
  • project result exploitation
Internationally accepted formats (3)

- International research & Europe
  - IDEAS (1980-ties): to investigate linking databases of research information
  - EXIRPTS (1987-1989) extended to include USA and Japan
  - concept of objects or entities such as project, person, or organisational unit with attributes
  - n:m mutual and auto-reflexive relationships, including roles and time
  - fully internationalized
  - extensible, providing interoperability:
    - data exchange
    - heterogeneous distributed query/result environments
    - CERIF- compatible systems
  - European Science Foundation
    - CERIF in its new IT system and CORDIS
    - ERA-NETs funded by the EC use CERIF
    - IST-World and CISTRANA, providing an overview of European research, use CERIF
  - euroCRIS
    - developing CERIF further
Internationally accepted formats (4)

• The Dublin Core Metadata Initiative (DCMI)
  • DCMI shared innovation in metadata design and best practices by
    • Managing of DCMI specifications and metadata terms namespaces;
    • Managing DCMI-wide work themes;
    • Setting up and managing international and regional events;
    • Availability of meeting minutes and proceedings, project reports;
    • Tutorials, webinars and workshops in metadata best practices
    • Coordinating DCMI volunteers
  • Membership programmes provide funds for supporting of paid effort
  • DCMI's principles of operation are:
    • Open consensus building
    • International scope and participation
    • Neutrality of purposes and business models
    • Neutrality of technology
    • Cross disciplinary focus
Internationally accepted formats (5)

• **Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH)**
  
  
  • set of six verbs or services invoked within HTTP
    - Identify, ListMetadataFormats, ListIdentifiers, ListRecords, GetRecord, ListSets
    - The names of these verb functions start with ‘oaih’ and follow a “combine words with underscores” scheme (e.g., oaih_list_records, corresponding to the OAIPMH ListRecords verb, for harvesting records)
  

• **Data Providers**
  - Repositories of structured metadata

• **Service Providers**
  - Launch requests to harvest the metadata
How to measure the effects of scientific research (1)?

1. **On other scientists (1)**
   - Scientometric methods and indices of scientific quality
   - Calculating the h-index and other bibliometric and scientometric indicators from Google Scholar with the Publish or Perish software

   **but**

     - Different roles of science and engineering

   - *How scientometry is killing science*
     - [https://www.geosociety.org/gsatoday/archive/24/12/pdf/i1052-5173-24-12-44.pdf](https://www.geosociety.org/gsatoday/archive/24/12/pdf/i1052-5173-24-12-44.pdf) (Accessed on January 5th, 2018)
     - The situation in Turkey is candidly described, and it may sound familiar 😊

University of Zagreb, Faculty of Electrical Engineering and Computing, Department of Applied Computing
How to measure the effects of scientific research (2)?

1. **On other scientists (2)**
   - How to help them in building consortia for scientific/research projects?
   - How to help them retrieve more efficiently necessary information
     - Choice of keywords can differ significantly between author and reader
     - Full text search with fuzzy logic?
     - Training of neural networks on Big Data successful hits?
How to measure the effects of scientific research (3)?

2. On the quality of education

At university:

Who can dedicate more time to boost his/her scientific excellency?

a) A scientist overloaded with education of numerous students

b) A scientist overloaded with working on real-life well-paid projects

c) An idle scientist who has few students and even less real-life projects, due to prevailing irrelevance of his/her field of interest
How to measure the effects of scientific research (4)?

The Author as an example for c)

*Idle scientist who has few students and even less real-life projects, due to aging and occasional health problems, after turning 66 years*

- In the last few years he transferred from a) & b) to c):

---

**Damir Kalpić**

*University of Zagreb, Faculty of Electrical Engineering and Computing*

Verified email at fer.hr - [Homepage](https://scholar.google.hr/citations?user=BQKR-cwAAAAJ&hl=en)

---

**Google Scholar**

<table>
<thead>
<tr>
<th>Title</th>
<th>Cited By</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case study based on a multi-period multi-criteria production planning model</td>
<td>33</td>
<td>1995</td>
</tr>
<tr>
<td>The automatic creation of concept maps from documents written using morphologically rich languages</td>
<td>29</td>
<td>2012</td>
</tr>
<tr>
<td>Automated coding of census data</td>
<td>19</td>
<td>1994</td>
</tr>
<tr>
<td>A prototype for the short-term prediction of moving object's movement using markov chains</td>
<td>18</td>
<td>2009</td>
</tr>
<tr>
<td>Operacijska istraživanja</td>
<td>16</td>
<td>1996</td>
</tr>
</tbody>
</table>

---

University of Zagreb, Faculty of Electrical Engineering and Computing, Department of Applied Computing
How to measure the effects of scientific research (5)?

More than half of citations were in the last 5.5 years!
How to measure the effects of scientific research (6)?

The most cited papers make sense 😊

Two of the best author’s real life projects, major scientific and an educational contribution, and a topic from biology (rambling wolves) prone to higher citations:

<table>
<thead>
<tr>
<th>TITLE</th>
<th>CITED BY</th>
<th>YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case study based on a multi-period multi-criteria production planning model</td>
<td>33</td>
<td>1995</td>
</tr>
<tr>
<td>D Kalpić, V Mornar, M Baranović</td>
<td></td>
<td></td>
</tr>
<tr>
<td>European journal of operational research 87 (3), 658-669</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The automatic creation of concept maps from documents written using morphologically rich languages</td>
<td>29</td>
<td>2012</td>
</tr>
<tr>
<td>K Zubrinic, D Kalpic, M Milicovic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expert systems with applications 39 (16), 12709-12718</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automated coding of census data</td>
<td>19</td>
<td>1994</td>
</tr>
<tr>
<td>D Kalpić</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A prototype for the short-term prediction of moving object’s movement using markov chains</td>
<td>18</td>
<td>2009</td>
</tr>
<tr>
<td>I Nizetic, K Fertalj, D Kalpic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Technology Interfaces, 2009. ITI’09. Proceedings of the ITI 2009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operacijska istraživanja</td>
<td>16</td>
<td>1996</td>
</tr>
<tr>
<td>D Kalpić, V Mornar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZEUS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>