

Perspectives for development of the Croatian Research Information System CroRIS

Prof. Damir Kalpić, PhD

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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:



Europska unija
Zajedno do fondova EU



EUROPSKI STRUKTURNI
I INVESTICIJSKI FONDovi



Operativni program
**KONKURENTNOST
I KOHEZIJA**

Projekt je sufinancirala Europska unija iz Europskog fonda za regionalni razvoj

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)



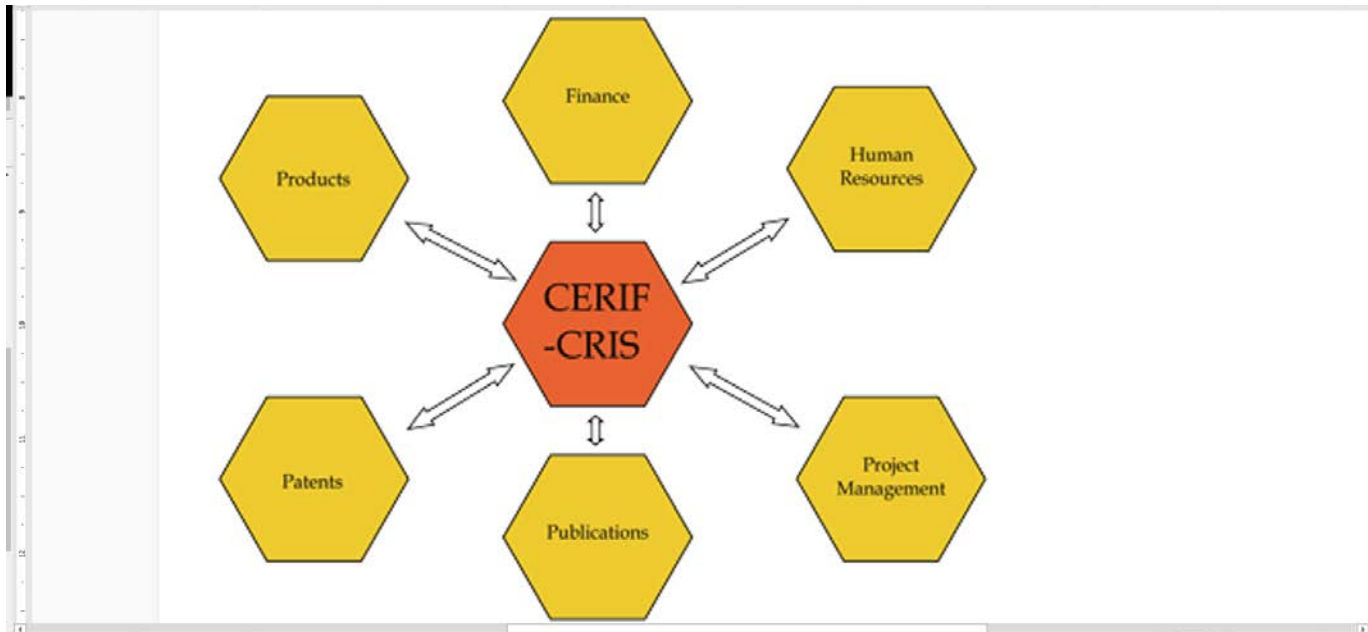
State as-is in Croatia (2)

- 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)

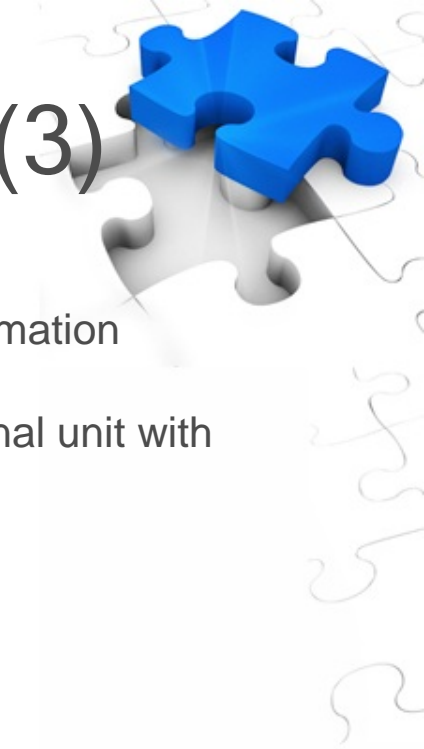
- **Common European Research Information Format (CERIF)**
- <https://ercim-news.ercim.eu/en68/european-scene-qsupport-of-the-research-processq/cerif-the-common-european-research-information-format> (Accessed on May 15th, 2018):



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
- uniCRIS AG, <http://www.unicris.com/> (Accessed on May 18th 2018)
 - 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)



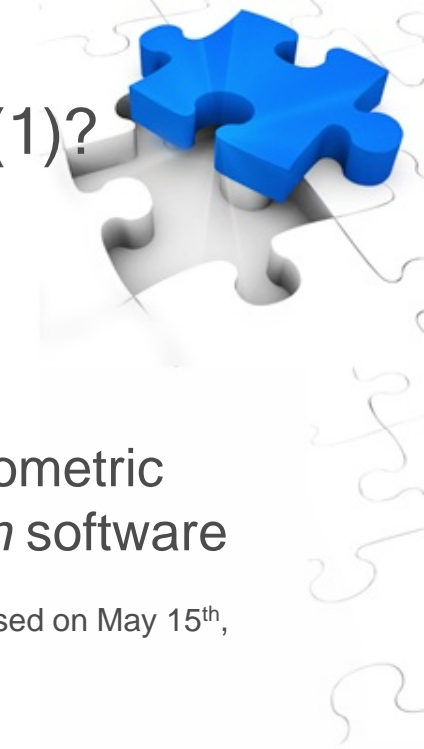
- **The Dublin Core Metadata Initiative (DCMI)**
- <http://www.dublincore.org/about/> (Accessed on May 15th, 2018)
- DCMI shared innovation in metadata design and best practices by
 - Managing of DCMI specifications and metadata terms namespaces;
 - Managing DCMI-wide work themes;
 - Setting up and managing 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)**
 - <https://www.openarchives.org/pmh/> (Accessed on May 15th, 2018)
 - **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 OAI-PMH ListRecords verb, for harvesting records)
 - <https://cran.r-project.org/web/packages/OAIHarvester/vignettes/oaih.pdf> (Accessed on May 25th, 2018)
- *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
- <https://www.emeraldinsight.com/doi/pdfplus/10.1108/14684520911011070> (Accessed on May 15th, 2018)

but

- Peter J. Denning: *The Profession of IT The Forgotten Engineer*, Communications of the ACM, Dec. 2017, Vol 60. No. 12, DOI:10.1145/3152912
 - 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> (Accessed on January 5th, 2018)
 - The situation in Turkey is candidly described, and it may sound familiar 😊

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](#)
operational research information systems

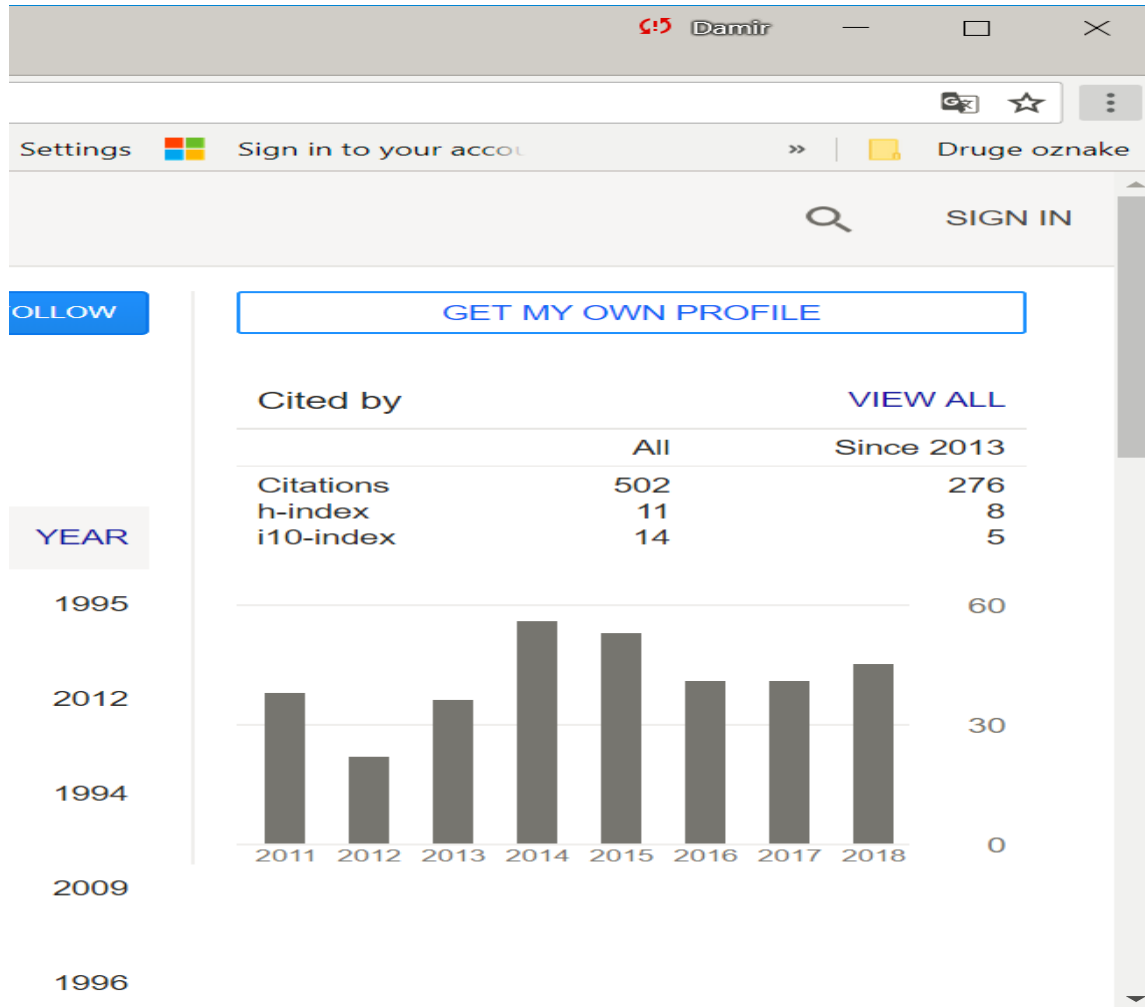
TITLE	CITED BY	YEAR
Case study based on a multi-period multi-criteria production planning model D Kalpić, V Mornar, M Baranović European journal of operational research 87 (3), 658-669	33	1995
The automatic creation of concept maps from documents written using morphologically rich languages K Zubrinic, D Kalpic, M Milicevic Expert systems with applications 39 (16), 12709-12718	29	2012
Automated coding of census data D Kalpić Journal of Official Statistics 10 (4), 449-463	19	1994
A prototype for the short-term prediction of moving object's movement using markov chains I Nizetic, K Fertalj, D Kalpic Information Technology Interfaces, 2009. ITI'09. Proceedings of the ITI 2009 ...	18	2009
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	All	Since 2013
Citations	502	276
h-index	11	8
i10-index	14	5

Year	Citations
2011	35
2012	25
2013	30
2014	55
2015	50
2016	40
2017	40
2018	45

How to measure the effects of scientific research (5)?

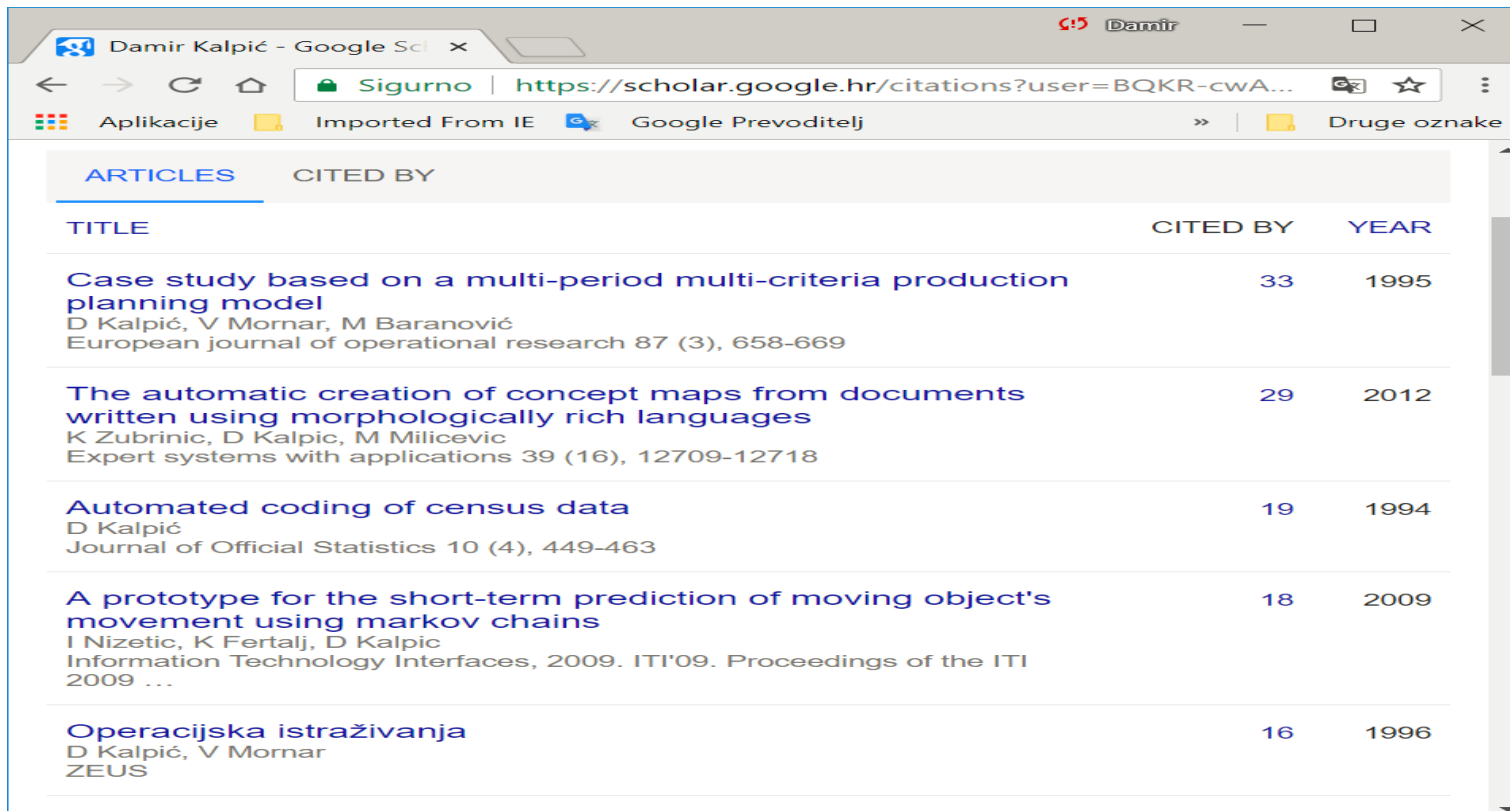
More than *half* of citations were in the *last 5.5 years!*



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:



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