

The XML/RDF encoding
schemes for CERIF.
Application profiles for scientific
metadata.

Andrei Lopatenko

CSTIT RAS.

andrei@ccas.ru

andrei@derpi.tuwien.ac.at

Integration of CRIS

- Reasons
 - Why we need integrate CRISes
- Requirements
 - How we should integrated them
 - What are primary requirements for integration solution
- Solutions
 - What our solution provides new for integration

Current situation

- There are a number of CRIS in Europe and national areas (Russian, as example)
- Usually each CRIS stores geographically local (university, district, country) data. Some of them store sector data scientific data (for innovations only, chemical data)
- Each CRIS provides a limited number of services
- The users of CRIS has access to data stored in it only, no CRIS works as a gateway or as a mediator

Current situation

- As usual researchers need an access to all information related to their topic, not local only
- Required information is stored in a number of CRIS
- To get information researcher need to know about and to have access to a number of CRIS

Current situation

- So to give to researcher ability to get required information we should
 1. to give him list of all related to his research CRISes(develop CRIS portals)
 2. to give him access to CRISes
 3. to teach him to work with CRISes
- Such solution is difficult, expensive, time-consumable, people-consumable and maybe inappropriate in some situations

Example

Russian

- ISIR (Integrated System of Informational Resources) of Russian Academy of Science (<http://isir.ras.ru>) - Central Datawarehouse for RAS

holds data about

- Persons, Institutes, Departments, Projects, Publications

Example

ISIR

- Central Node (Presidium of RAS). Data about all Academy of Science
- Regional Nodes (Kazan). Data of institutes of Kazan Scientific Center
- Sectorial Nodes (Mathematics, joint with MathNET, Telecommunications)

Example

Russia

- Innovation projects of Russian Fund of Basic Research (innovation projects, results, patents)
- Oriental Studies (epigraphic sources)

Example

- Data of Innovation Projects system and regional node of ISIR are a great asset to central node of ISIR, because those data describes activities in Academy of Science
- Some data (staff) of the central node of ISIR are a great asset for innovation projects system

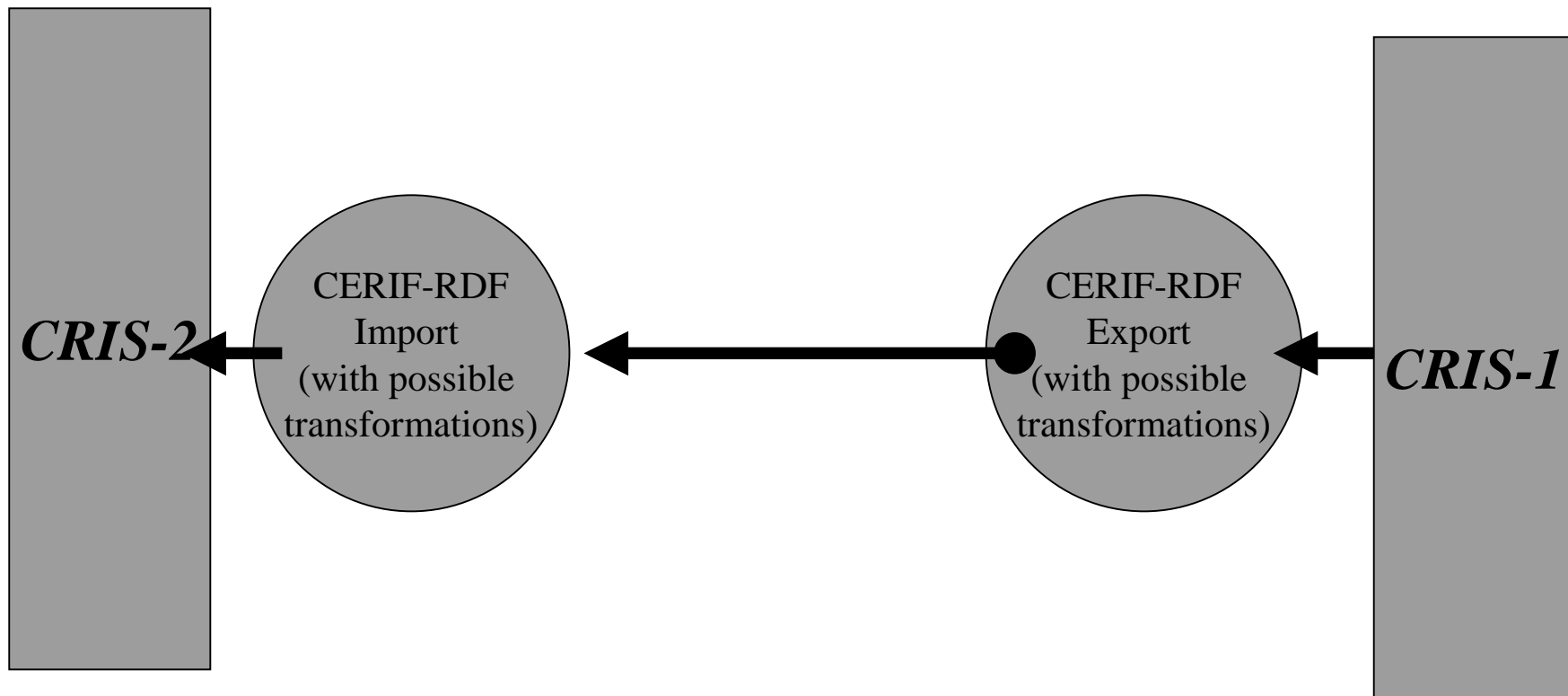
Primary requirements

Data integration technique

- should be platform and language independent
- work in case of independent development of each CRIS
- able to solve problems of semantic and schematic differences between systems, work in heterogeneous environment with independently developing information systems

Solution

- To exchange data between CRIS
- To use RDF as a language for encoding data
- To use kernel metadata model(CERIF), which provides basic metadata model for interoperation of CRIS
- To use application profiles as a method for expanding metadata schemas to application needs



RDF for encoding

- Power of RDF in expressing data.
- RDF is semantic.
- There is XML encoding of RDF. XML standard applications for signing, linking, identifying, searching, transforming can be applied
- A lot of developed and emerging tools allow to easily develop solutions on RDF

CERIF

- A lot of CRIS store same kinds of data(semantically), which are described in CERIF standard
- CERIF is about ten-years subject of discussion and using by European CRIS project teams
- As author experience shows CERIF is detailed enough to define kernel, satisfying needs of CRIS and not detailed so to be schematic conflicted
- CERIF is multilevel (metadata model, data exchange model, Full model), what makes solution flexible

Application profiles

- To combine elements from a number of “namespace schemas”
- To override the default definitions of element with a definition that makes sense in a local context.
- To describe schema of application
- To specify dependencies among vocabulary terms
- To define multiple entity classes in a particular data model.
- To provide guidelines, in free text, about the local use of particular terms

Developing application-specific schemas

- Need to specify a set of elements and their properties
- Need to specify restrictions/integrity rules
- Need to specify which vocabulary and where
- Need to specify relation between elements

Problems

- There can be semantic and schematic differences between namespaces

Our application profiles consist of.

- A set of included namespaces
- Definitions semantic relations between elements from different namespaces
- Overriding definition of elements
- Vocabularies definitions and vocabularies content
- Definitions semantic relations between elements from different vocabularies
- Rules for resolving semantic and schema conflicts

Application profiles. Advantages

- Allow to reuse schemas
- Proved to be useful (SCHEMAS, UKOLN DESIRE, Z39.50 applications)
- Close to Digital Library projects such as Digital Library Warwick Framework

Current state

Have developed

1. RDF schema for CERIF.
2. importing and exporting tools from CERIF database (published on cordis) into CERIF RDF
3. vocabulary tools
4. application profiles managing tools

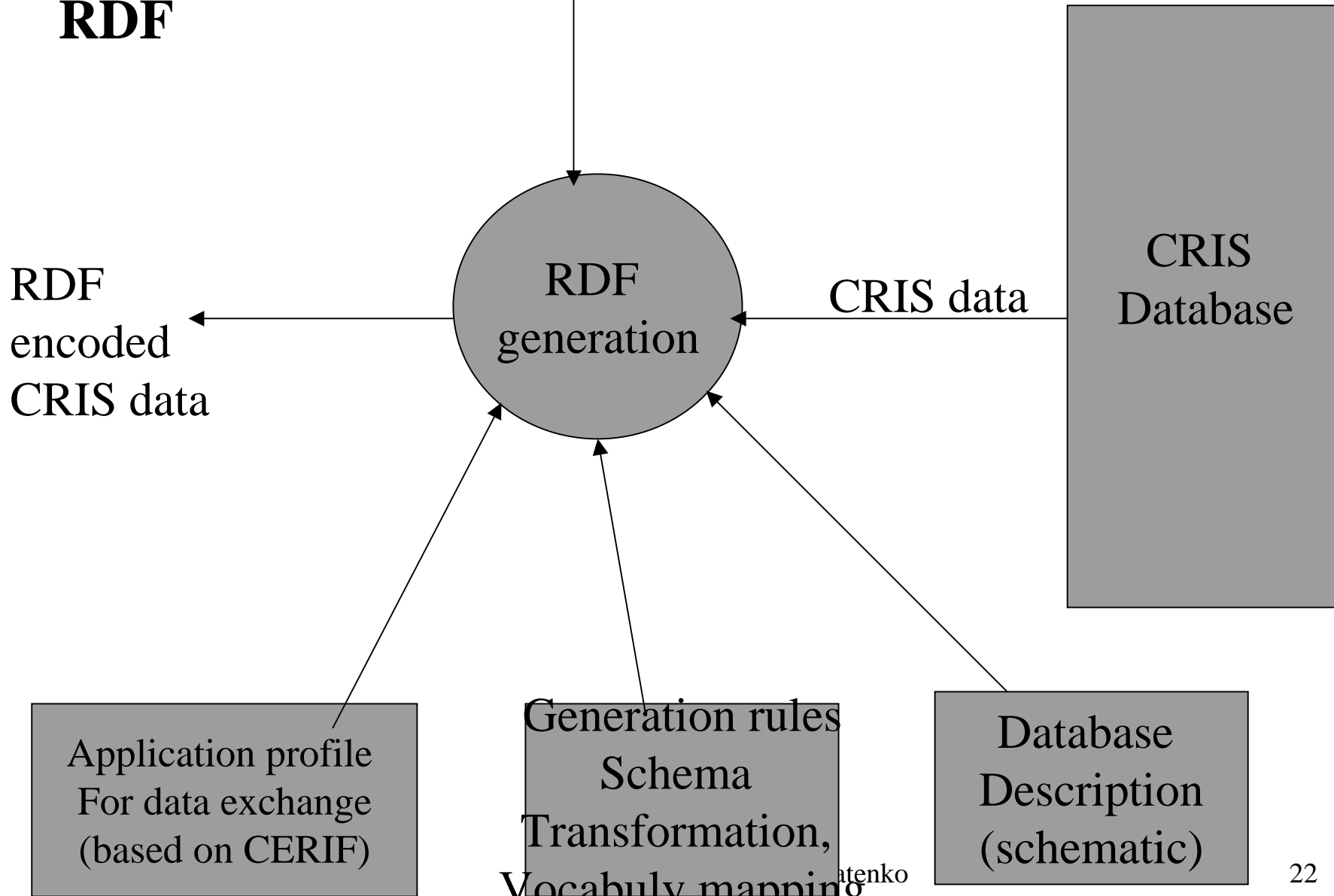
Representing CERIF in RDF.

Possible usage

- Data exchange between CRIS
- Semantic representation of research data in the web pages for data gathering. RDF-DC is not sufficient
- Translating data into RDF for additional functionality, which can not be provided by CRIS.
Developing Value-added services

Exporting RDF

Java, Xerc, ODBC tools



http://128.130.73.166/RFBR/Dictionaries/voc_item.asp?parent=4945&Action=Edt - Microsoft Internet Explorer

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Address http://128.130.73.166/RFBR/Dictionaries/voc_item.asp?parent=4945&Action=Edt Go Links >>

Registry

Defining application profiles

Name	ISIR.App
Description	Metadata for ISIR
URI	CERIF:RDF-schema for CERIF metadamodel ISIR-vCard:vCard schema Innovations:the namespace intended to describe data related to innovations, intellectual rights RDFS:W3 RDFS schema

Done Internet

http://128.130.73.166/RFBR/Dictionary/voc_item.asp?parent=2828&Action=Edt - Microsoft Internet Explorer

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Address http://128.130.73.166/RFBR/Dictionary/voc_item.asp?parent=2828&Action=Edt Go Links >>

Name	Publications
Description	Property describing list of person's publications
Type	Property
See also	No
Defined by	No
Constraint resource	No
Constraint property	No
Subclass of	RDFS:Bug <input type="button" value="Go"/>
Subproperty	íâò
rdfs:Domain	No CERIF:PersonPublication CERIF:Project-abstract CERIF:ResearchInterest <input type="button" value="Go"/>

Done Internet

Creating and supporting namespaces

http://128.130.73.166/RFBR/Dictionaries/rdf_printer.asp - Microsoft Internet Explorer

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Address http://128.130.73.166/RFBR/Dictionaries/rdf_printer.asp?SchemaID=1 Go Links >>

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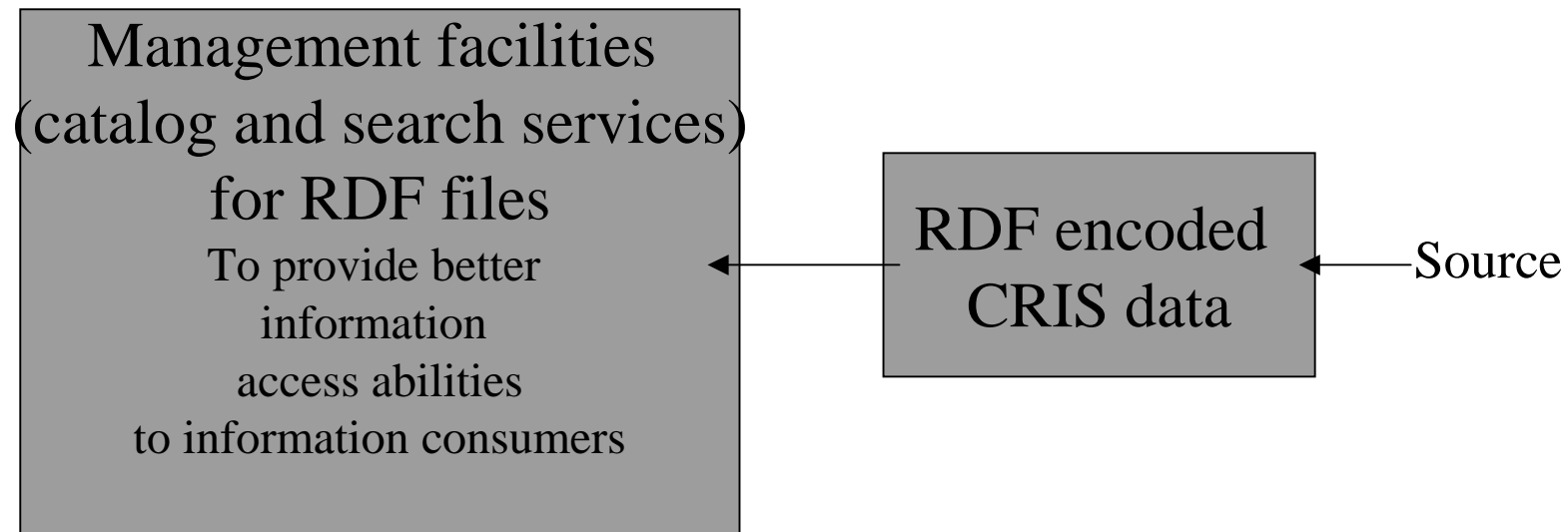
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  <rdfs:Range rdf:resource="#OrgUnit"/>
  <rdfs:Comment>Research interests of the publication
</rdfs:Comment>
  <rdfs:subClassOf rdf:resource="#Seq"/>
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<rdf:Description ID="OrgUnit-Research-Activities">
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Publishing RDF Schema

Done



Management facilities

Organizing information. Catalogs. Search services.

Example:

Directories at http or ftp server

- Projects
 - Computer Science
 - 2001
 - Auris.rdf
 - 2000
 - Chemical
- Persons
 - Vienna University of Technology
 - Computing Center of Russian Academy of Science

http://128.130.73.166/data/projects/computerscience/2001/auris.rdf - Microsoft Internet Explorer

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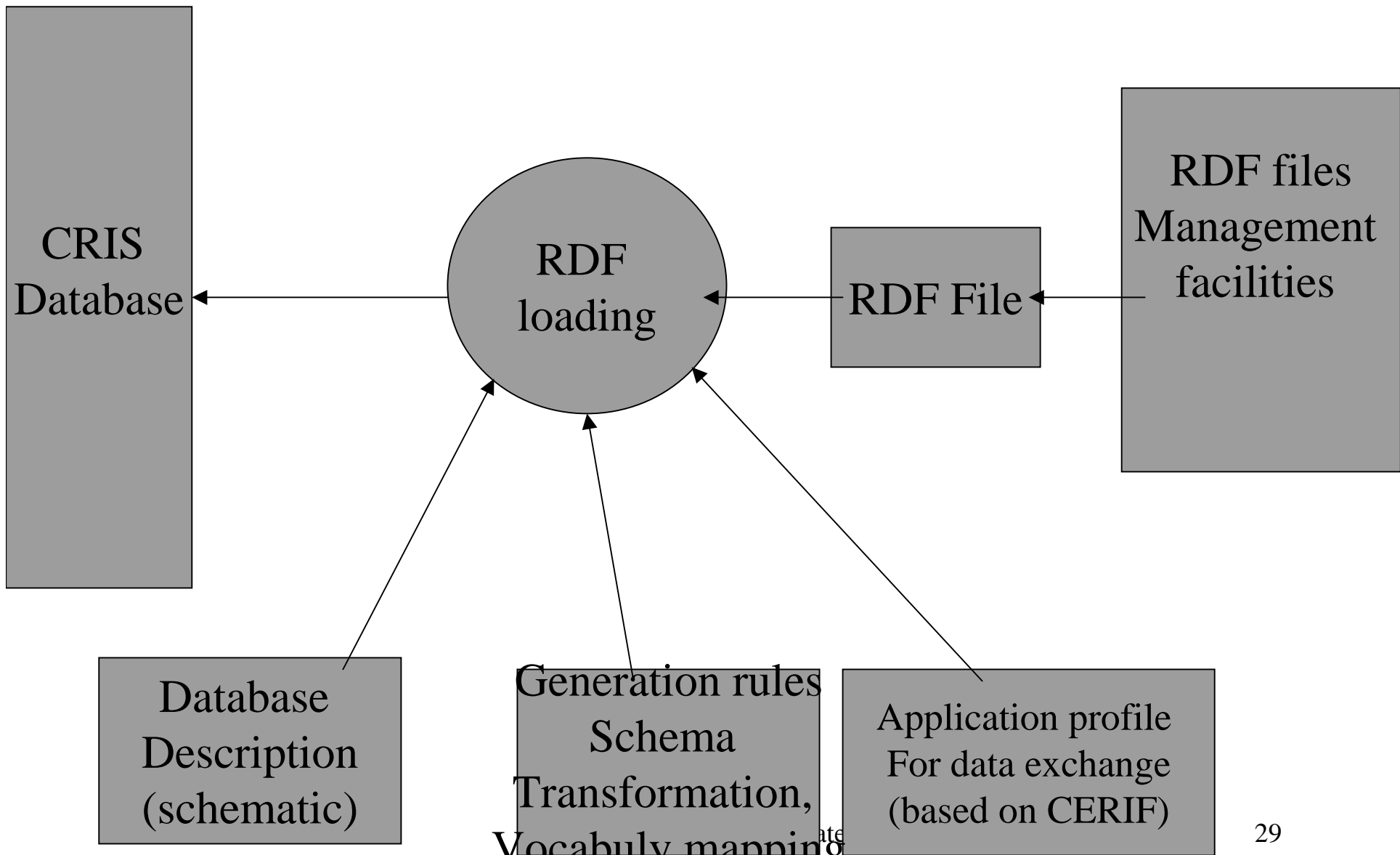
Address http://128.130.73.166/data/projects/computerscience/2001/auris.rdf Go Links >>

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<family-name>Krieger</family-name>
<uri>email:krieger@derpi.tuwien.ac.at</uri>
<nationality>Austrian</nationality>
</person>
- <project ID="project:E015-01-08">
  <proj_ID>project:E015-01-08</proj_ID>
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- <participants>
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    </rdf:li>
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</cerif-date>
```

•Projects
–Computer Science
•2001
–Auris.rdf

Project description

Done



Representing in CERIF RDF FoDok data (TUW)

Projects

- Title
- Persons take part in
- Acronym
- Begin and end data
- Description
- URL
- etc



Forschungsdokumentation Online

TU
WIEN

Außeninstitut der Technischen Universität Wien

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[Technische Universität Wien](#)

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Forschungs-Projekt E015-01-08

Titel: Multimediale Neugestaltung und Erweiterung von AURIS (Austrian Research Information System) zur Steigerung der Attraktivität und Bedienerfreundlichkeit der österreichischen Forschungsdokumentation

Titel (english): Austrian Research Information System: Multimedial Enhancement

Leiter (Kontaktperson):

Name: Niedermayer, Walter (Dipl.-Ing.)

Spezialgebiet: Forschungsdokumentation; Current research information systems

E-Mail-Adresse: walter@derpi.tuwien.ac.at

Name: Krieger, Andreas

Spezialgebiet: Datenverarbeitung; Programmierung; Datenbank

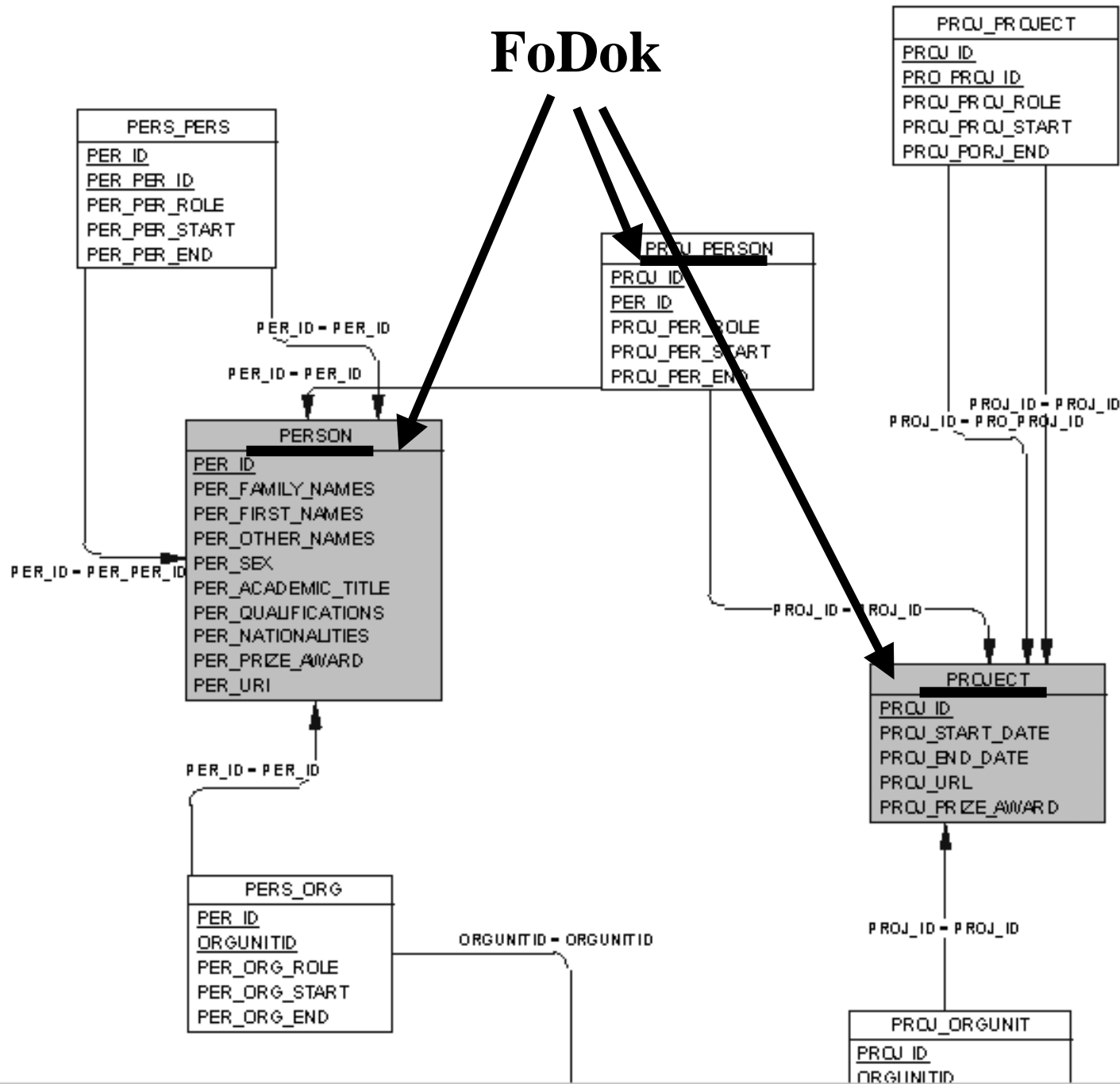
E-Mail-Adresse: krieger@derpi.tuwien.ac.at

Auftraggeber / Forschungsprogramm / Programm-Akronym / Projektnummer: BMVK

Beginn-Datum: 2000-02

Ende-Datum: 2001-12

FoDok




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  <family-name> Niedermayer </family-name>
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</person>

<person id="person:2">
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  <family-name>Krieger </family-name>
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  <sex>M</sex>
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  </participants>
```

RDF Semantic

Allows to automatically include new CRIS in data exchange, specifying semantic definition of its entities without programming

Allows to automatically include new types of entities existing CRIS specifying their semantic relations with defined in schema

- Subclassing
- Other semantic descriptions(MetaNet)

Russian CRIS

ISIR RAS (Integrated System of Informational
Resources of Russian Academy of Science)

(<http://isir.ras.ru>)

Data about institutions, departments, persons,
projects, publications

Distributed (Presidium, Computing Center, Kazan,
Mathematical Institute MathNET)

Primary audience: Researchers, Administrators,
Public

Russian CRIS. ISIR RAS.

Services

- Searching informational resources (web)
- Navigating in information space (web)
- Publishing information through the web
- Data exporting and importing in RDF for organizing vertical and horizontal information infstructures (application profile based on CERIF)
- Distributed services for data gathering

Integrated System of Information Resources of the Russian Academy of Sciences - Microsoft Internet Explorer

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Address <http://isir.ras.ru/en/db/Home.asp?P=.oi.vi.fi.uk.pr.id.ln-en> Go Links >>

Language Structure: Organizations Search: Organizations Persons Projects Publications ?

Integrated System of Information Resources of the Russian Academy of Sciences

Maps **Structure** **Search services**

Integrated System of Information Resources (ISIR) of RAS was developed to provide access to various information about the Russian Academy of Sciences.

The system currently provides the following data:

- *Directory of administrative structure* of the RAS
 - *Presidium* of the RAS
 - *Branches* of the RAS
 - *Scientific centers* of the RAS
 - *Institutions* of the RAS
 - *Departments* of the institutions of the RAS

(1 item remaining) Downloading picture <http://isir.ras.ru/img/start.gif...> Internet

Organizational structure of Russian academy of sciences

- ▷ Members of Russian academy of sciences
- ▷ Corresponding members of Russian academy of sciences

- ▷ PRESIDIUM OF RUSSIAN ACADEMY OF SCIENCES
- ▼ BRANCHES OF RUSSIAN ACADEMY OF SCIENCES
 - ▷ BRANCH OF MATHEMATICS
 - ▷ BRANCH OF GENERAL PHYSICS AND ASTRONOMY
 - ▷ BRANCH OF NUCLEAR PHYSICS
 - ▷ BRANCH OF PHYSICAL AND TECHNICAL PROBLEMS OF ENERGETICS
 - ▷ BRANCH OF PROBLEMS OF MACHINE-BUILDING, MECHANICS AND CONTROL SYSTEMS
- ▼ BRANCH OF INFORMATICS, COMPUTER EQUIPMENT AND AUTOMATIZATION
 - ▼ Computing Centre of the Russian Academy of Sciences
 - *General info*
 - *Structure*
 - *Employees*
 - *Projects*
 - *Publications*
 - ▷ Institute of computer-aided design
 - ▷ Institute of design and technological informatics
 - ▷ Institute of Microprocessors
 - ▷ Institute of microelectronika and informatics
 - ▷ Institute for Mathematical Modelling of the Russian Academy of Sciences
 - ▷ Institute of optiko-neironnykh technologies
 - ▷ Problems institute of informatics
 - ▷ Problems institute of laser and information technologies
 - ▷ Keldysh Institute of applied mathematics RAS
 - ▷ Institute for Information Transmission Problems

Organization structure



Institute



BRANCH OF INFORMATICS, COMPUTER EQUIPMENT AND AUTOMATIZATION
Computing Centre of the Russian Academy of Sciences

General info **Structure** Employees Projects **Publications**

Pages: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

For the institute

1. I. V. Belotelov
AN ECOLOGICAL DEMOGRAPHIC ECONOMIC MODEL. *Abstracts of the 3rd Moscow International Conference on Operations Research (ORM2001) (Moscow, April 4-6, 2001)*, p. 91 (Full text: [pdf](#)), 2001

List of related resources

Type of resources

2. A. A. Charakhch'yan
Transliteration: Udarnoe szhatie plastiny na kline. *Transliteration: Prikladnaya mekhanika i tekhnicheskaya fizika*, *Transliteration: v pechati* (Full text: [pdf](#)), 2001
3. Y. I. Brodskii
Transliteration: Chastichnye predely izmerimyykh funktsii. *Transliteration: Modelirovanie, dekompozitsiya i optimizatsiya slozhnykh dinamicheskikh protsessov*, p. 33-40 (Full text: [pdf](#)), 1999
4. Y. N. Pavlovskii
Transliteration: Shkaly rodov struktur, invariantnye pri izomorfizmakh termy i sootnosheniya.. *Monograph*, p. 193 (Full text: [pdf](#)), 2001
5. V. I. Tsurkov
"Large-scale Optimization - Problems and Methods", Kluwer Academic Publishers, Dordrecht. *Monograph*, p. 320, 2001

General info

N. N. Olenev , N. V. Belotelov

AN ECOLOGICAL DEMOGRAPHIC ECONOMIC MODEL (paper at conference)

Abstracts of the 3rd Moscow International Conference on Operations Research (ORM2001) (Moscow, April 4-6, 2001) , 2001 , p.91 , english

**Page describing
information
resource**

Abstract

PUBLICATION

A non-linear model of ecological, demographic, and economic processes is presented to give a useful tool for global analysis of international labour mobility and trade. The model considers a set of points (countries) on the plane, each determined by dynamics of their own variables, and interacted with each other. The basis for this model is determined on the hypotheses that:

1. population can migrate from one point to another to get the best level of living;
2. population consist of two employment groups with skilled and unskilled labour;
3. production function converts skilled and unskilled labour units into effective labour units.

The level of living at the specified point is determined by economic activity and quality of environment.

Keywords

non-linear model, ecological, demographic, economic, international labour mobility, trade, skilled and unskilled labour, economic activity, environment quality

Full text

Search for person - Microsoft Internet Explorer

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Address http://isir.ras.ru/en/db/search_per.asp?P=.oi-50.vi-fi.ln-en Go Links >>

Language Structure: Organizations Search: Organizations Persons Projects Publications ?

Search for person

Query	Search result
Last name <input type="text" value="Lopatenko"/>	Rank <input type="text"/>
First name <input type="text"/>	Doctorate degrees <input type="text"/>
Middle name <input type="text"/>	ph/fax <input type="text"/>

Search over the Academy of sciences
 Search in organization

BRANCHES OF RUSSIAN ACADEMY OF SCIENCES

Search page for Persons

Internet

Lopatenko A.S. - General info - Microsoft Internet Explorer

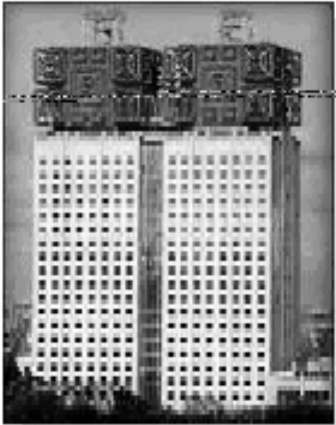
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Address http://isir.ras.ru/en/db/show_per.asp?P=.id-5801.In-en Go Links >>

Language Structure: Organizations Search: Organizations Persons Projects Publications ?

Andrei Sergeevich Lopatenko

General info	Projects	Publications
 <p>Junior scientist</p>	<p>Center of scientific telecommunications and information technologies <i>Information technology department</i> phone: (095)9383938 fax: (095)9383938 e-mail address: andrey1@ccas.ru</p> <hr/>	
<p>Post graduate student</p>	<p>Computing Centre of the Russian Academy of Sciences <i>Department of mathematic modelling of design systems</i> <i>Sector of software of CAD system and design of information and computer systems</i></p> <hr/>	

Page describing resource
PERSON

Links to related resources

http://isir.ras.ru/en/db/browse_adm.asp?P=.oi.vi.fi.id-5801.In-en Internet

Innovation projects

Holds data about

- Innovation projects
- Innovation results
- Patents

To support process of development innovations projects, for technology dissemination

Audience: investors, researchers, funds, innovation relay centers

Innovation projects

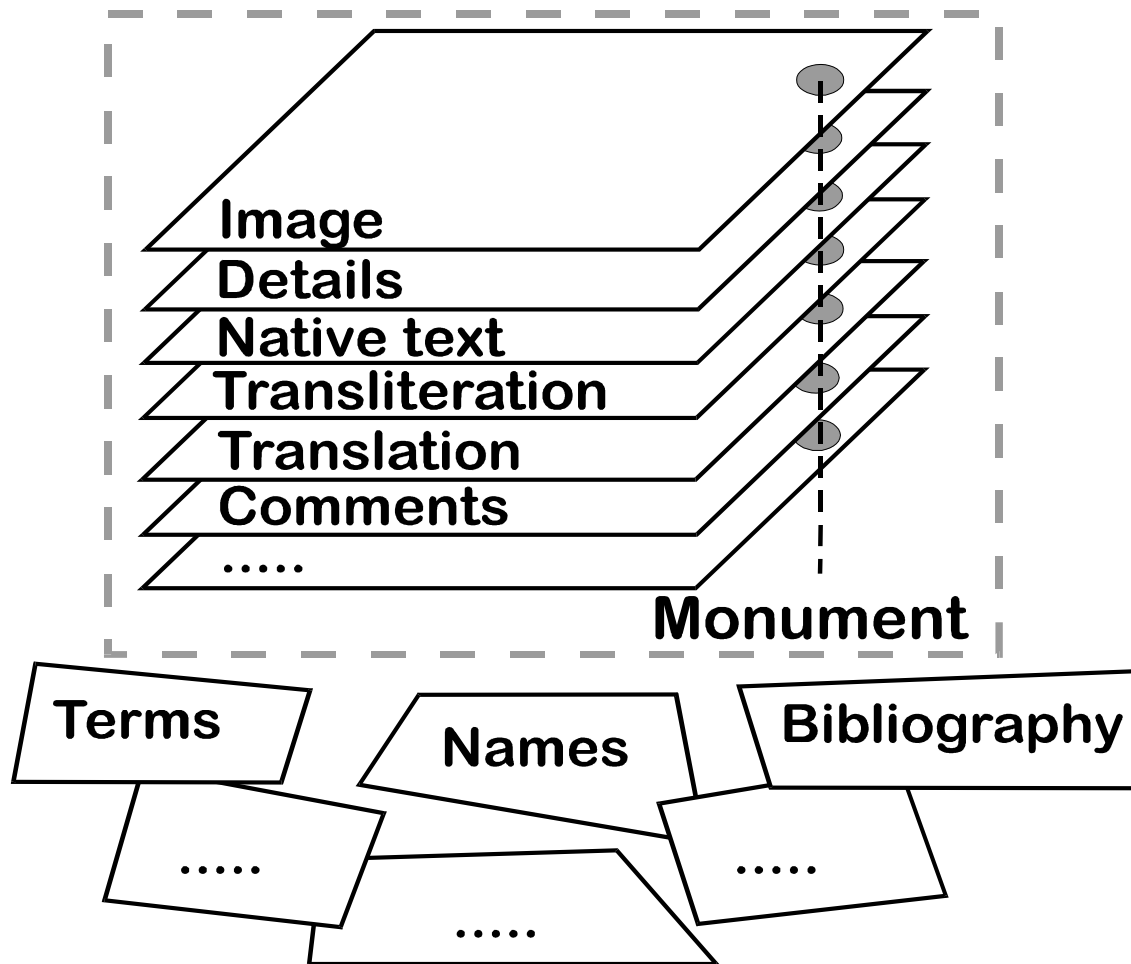
- Data can be entered by
 - Internet forms (secure)
 - RDF description
- Data can be viewed by
 - Web
 - RDF files

*The Creation of the Logical
Model of the Database for the
Thematic Epigraphic Set
(Referring to the North Indian Early
Mediaeval Land Grants)*

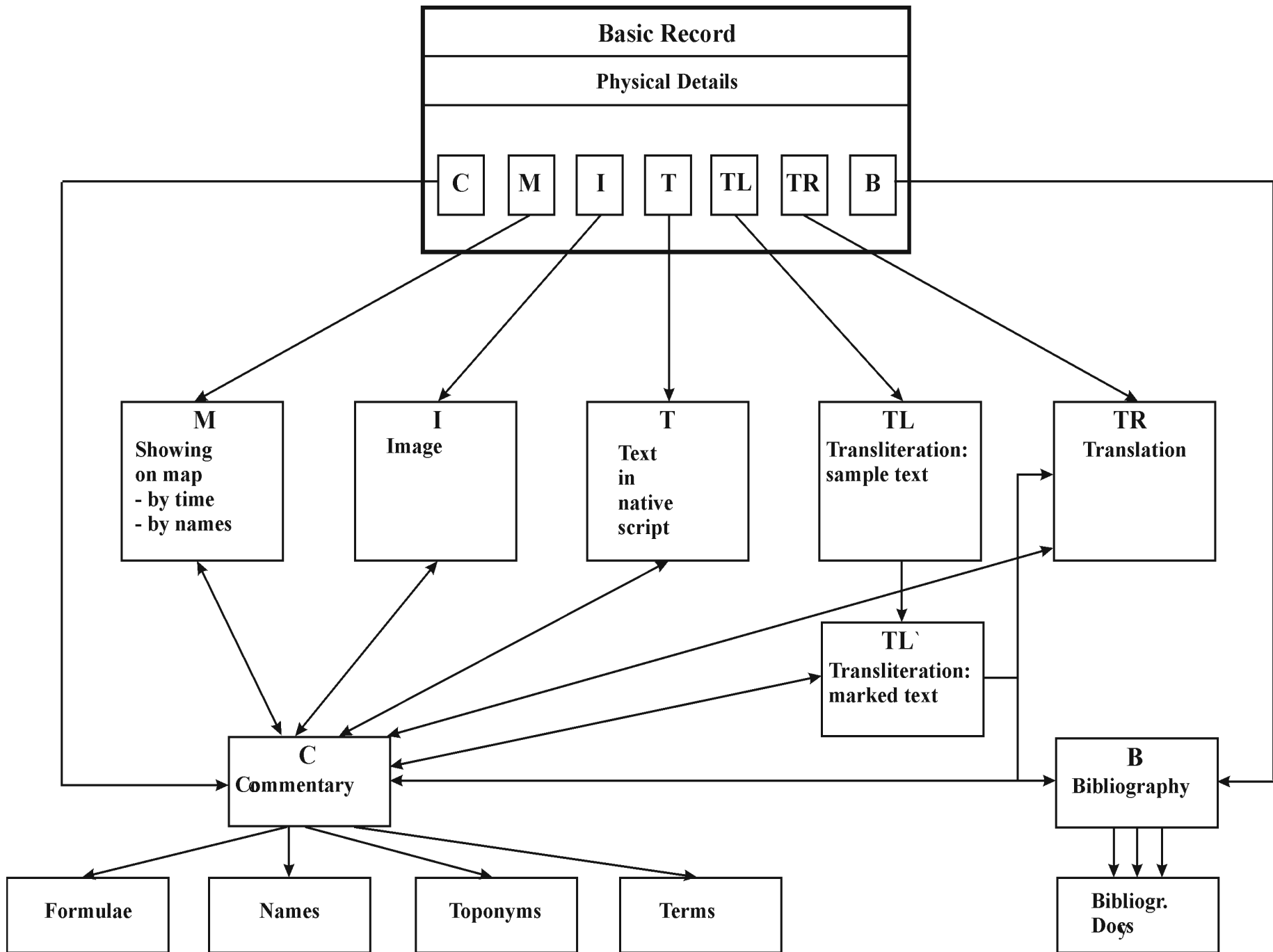
Presentation provided by prof.
Stolyarov A. A. Institute for Oriental

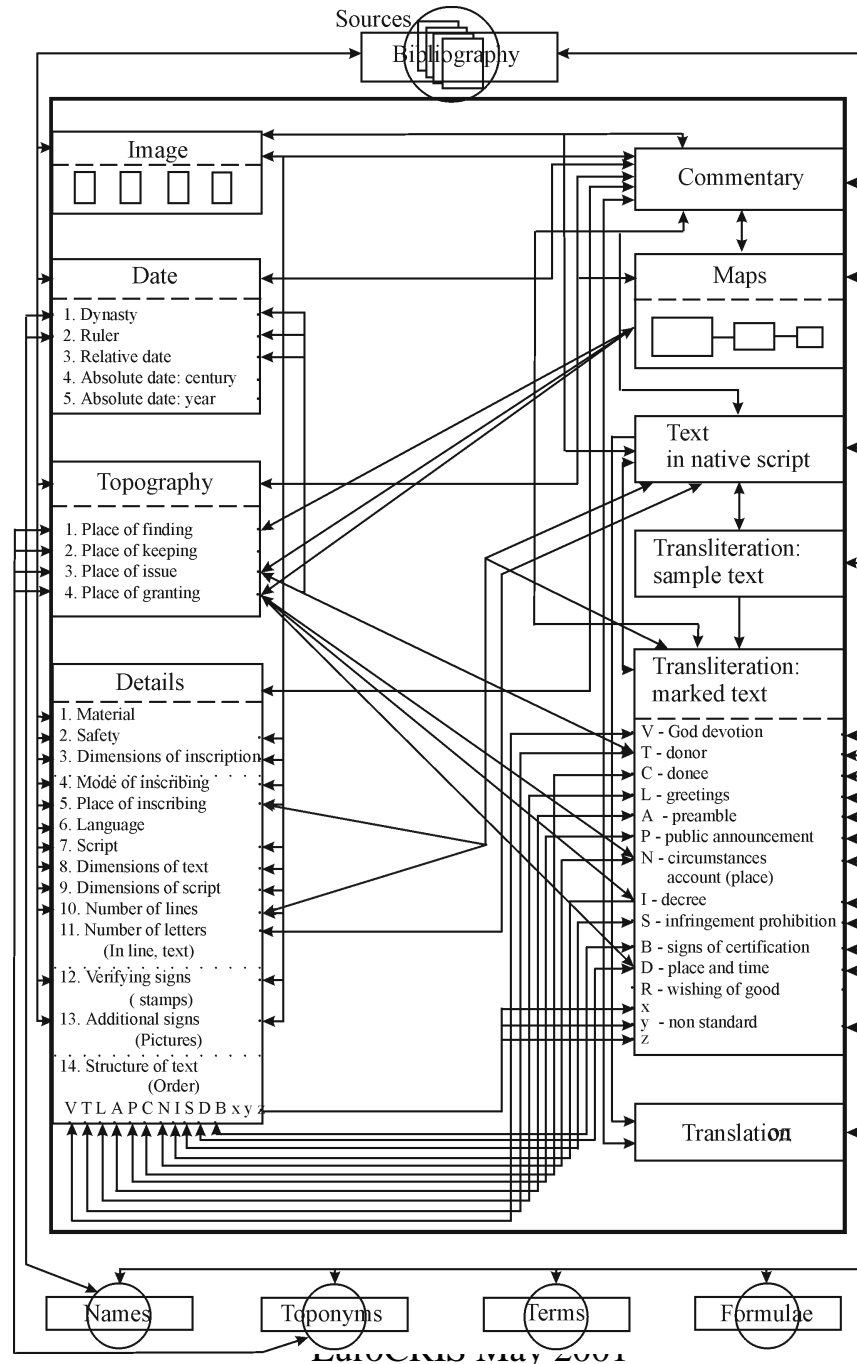
Studies Russia
CS FII RAS Andrei S. Lopatenko
EuroCRIS May 2001

The method of investigating thematic subsets of epigraphic sources having the homogenous inner structure permits the scholar to treat them as certain metatext



Using this model the scholar can according to his interests concentrate his attention not upon all layers of his DB but upon one or two of them. The others could be “switched in” according to the necessity.





1. *inVocatio* - God devotion,
2. *inTitulatio* - donor,
3. *insCriptio* - donee,
4. *saLutatio* - greetings,
5. *Arenga* - preamble,
6. *Promulgatio* - public announcement,
7. *Narratio* - account of circumstances,
8. *dIspositio* - decree,
9. *Sanctio* - prohibition of infringement,
10. *corroBoratio* - signs of certification,
11. *Datum* - place and time,
12. *appRecatio* - conclusion = wishing of good.

By Caps in Latin terms those characters are marked, which are expected to be used in the process of preparing the inner form description for short designation of that or other segment of inner structure of the document under research.

Microsoft Excel - CP-Bibl

Файл Правка Вид Вставка Формат Сервис Данные Окно Справка

Arial Cyr 10

A211 = Itaunja (Lucknow museum) CP Inscription of Govindachandradeva, V.S. 1186

	A	B	C	D	E	F
1	GO Name Name	State	District	Centur	Year	Dynas
2	Taxila CP Inscription of Patika, y.78	West Punjab	Rawalpindi	1	~21	Kushe
3	Kalawan CP Inscription, y. 134	West Punjab	Rawalpindi	1	~77	Kushe
4	Taxila Silver Scroll Inscription of a Kushana King, y. 136	West Punjab	Rawalpindi	1	~79	Kushe
5	Sui Vihar CP Inscription of Kanishka 1, y. 11	West Pakistan	Bahawalpur	1	~89	Kushe
6	Nalanda Spurious CP Inscription of Samudragupta, y. 5	Bihar	Nalanda	6--7		Gupt
7	Gaya Spurious CP Inscription of Samudragupta, y. 9	Bihar	Gaya	6--7		Gupt
8	Damodarpur CP Inscription of the time of Budhagupta, Gupta y. 163	Bangladesh	Dinajpur	5	~482	Gupt
9	Damodarpur CP Inscription of the time of Kumaragupta 1, Gupta y. 124	Bangladesh	Dinajpur	5	~444	Gupt
10	Damodarpur CP Inscription of the time of Budhagupta	Bangladesh	Dinajpur	5	~476-94	Gupt
11	Nalanda Seal of Budhagupta	Bihar	Patna	5	~476-94	Gupt
12	Damodarpur CP Inscription of the time of Kumaragupta 1, Gupta y. 128	Bangladesh	Dinajpur	5	~447	Gupt
13	Dhanaidaha CP Inscription [of Kumaragupta 1], Gupta y.113	Bangladesh	Rajshahi	5	~432	Gupt
14	Kalaikuri-Sultanpur CP Inscription of the Gupta y. 120	Bangladesh	Rajshahi	5	~439	Gupt
15	Paharpur CP Inscription of the Gupta y. 159	Bangladesh	Rajshahi	5	~479	Gupt
16	Gunaighar CP Inscription of Vainyagupta, Gupta y. 188	Bangladesh	Tippera (Comilla)	6	~507	Gupt
17	Nandapur CP Inscription of the Gupta y. 169	Bihar	Monghir	5	~488	Gupt
18	Baigram CP Inscription of the Gupta y. 128	Bangladesh	Bogra	5	~448	Gupt
19	Indor CP Inscription of Skandagupta & Sarvanaga, Gupta y. 146	Uttar Pradesh	Bulandshahr	5	~466	Gupt
20	Bhitari Seal of Kumaragupta 2	Uttar Pradesh	Ghazipur	5--6		Gupt
21	Nalanda Seal of Vishnugupta	Bihar	Patna	5--6		Gupt
22	Nalanda Fragmentary Seal Inscription of Suvratavarman	Bihar	Patna	7	605-10	Maukharis c
23	Damodarpur CP Inscription of the Gupta y. 224	Bangladesh	Dinajpur	6	~543	Gupt
24	Faridpur CP Inscription of the time of Dharmaditya, R.y. 3	Bangladesh	Faridpur	6	540-60	
25	Faridpur CP Inscription of the time of Dharmaditya	Bangladesh	Faridpur	6	540-60	
26	Faridpur CP Inscription of the time of Gopachandra, R.y. 18	Bangladesh	Faridpur	6		
27	Mallasarul CP Inscription [of Vijayasena] of the time of Gopachandra, R.y. 33	West Bengal	Burdwan	6		
28	Khoh CP Inscription of Sarvanatha, Gupta (or K-C) y. 193	Madhya Pradesh	Satna	6	~512	ccakt
29	Khoh CP Inscription of Samkshobha, Gupta y. 209	Madhya Pradesh	Satna	6	~529	Avra
30	Asirgadh Copper Seal Inscription of Sarvavarman	Madhya Pradesh	East Nimar	6	575-85	Maukharis c
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