euroCRIS, CERIF and CRIS

Ed Simons, Ph.D., Radboud University Nijmegen, the Netherlands
President of euroCRIS

Workshop on *Empirical Foundations of Science and Innovation Policy*
Paris, France, Ministère de l'Enseignement Supérieur et de la Recherche
September 17th, 2013

Structure of the Presentation

- Short introduction of the Speaker
- euroCRIS “in a nutshell”
- The CERIF Research Information (meta)Data Model
- Concrete examples of application of CRIS (Netherlands, UK, Spain).
- Challenges
- Conclusions.

Introduction of the Speaker

- Ph.D. In Social Sciences
- Working at Radboud University, NL: Central “Concern Information Management” Department. (www.ru.nl/english)
- “International IT-project Manager” (especially IT-projects with universities in developing countries) Most recent project: OPUS-College: open source student registration and information system (www.opus-college.net).
- Initiator and project leader Dutch Research Information System (CRIS) “METIS”.
  - Development of Dutch CRIS already started in 1992 . First implemented in 1993.
  - Since 2003: used by all Dutch universities and Royal Academy of Sciences.
- Since January 2013: President of euroCRIS.

The euroCRIS organisation

- International nonprofit association, of users, experts and developers of research information systems (CRIS)
- Mission statement: "Advancing exchange of Research Information through CERIF"
- Main activity: development, maintenance and promotion of the CERIF metadatamodel, the "Common Euopean Research Information Format", a standard for the development of and interoperability between CRIS. CERIF is an official EU Recommendation to Member States.
- Also: offering a platform for the exchange of ideas and experiences on CRIS and RI in general.
- euroCRIS members range from institutions (universities, researcch institutes) over funding agencies (e.g. DFG) and national RI organisations (e.g. KNAW, SURF (nl), JISC (uk)) to vendors of CRIS systems (Atira, Avedas, Symplectic) and major publishers (e.g. Elsevier).
- Currently 179 members from 43 countries, mainly Europe (but e.g. Also Canada and US)

euroCRIS
Current Research Information Systems

Strategic Partners of euroCRIS.

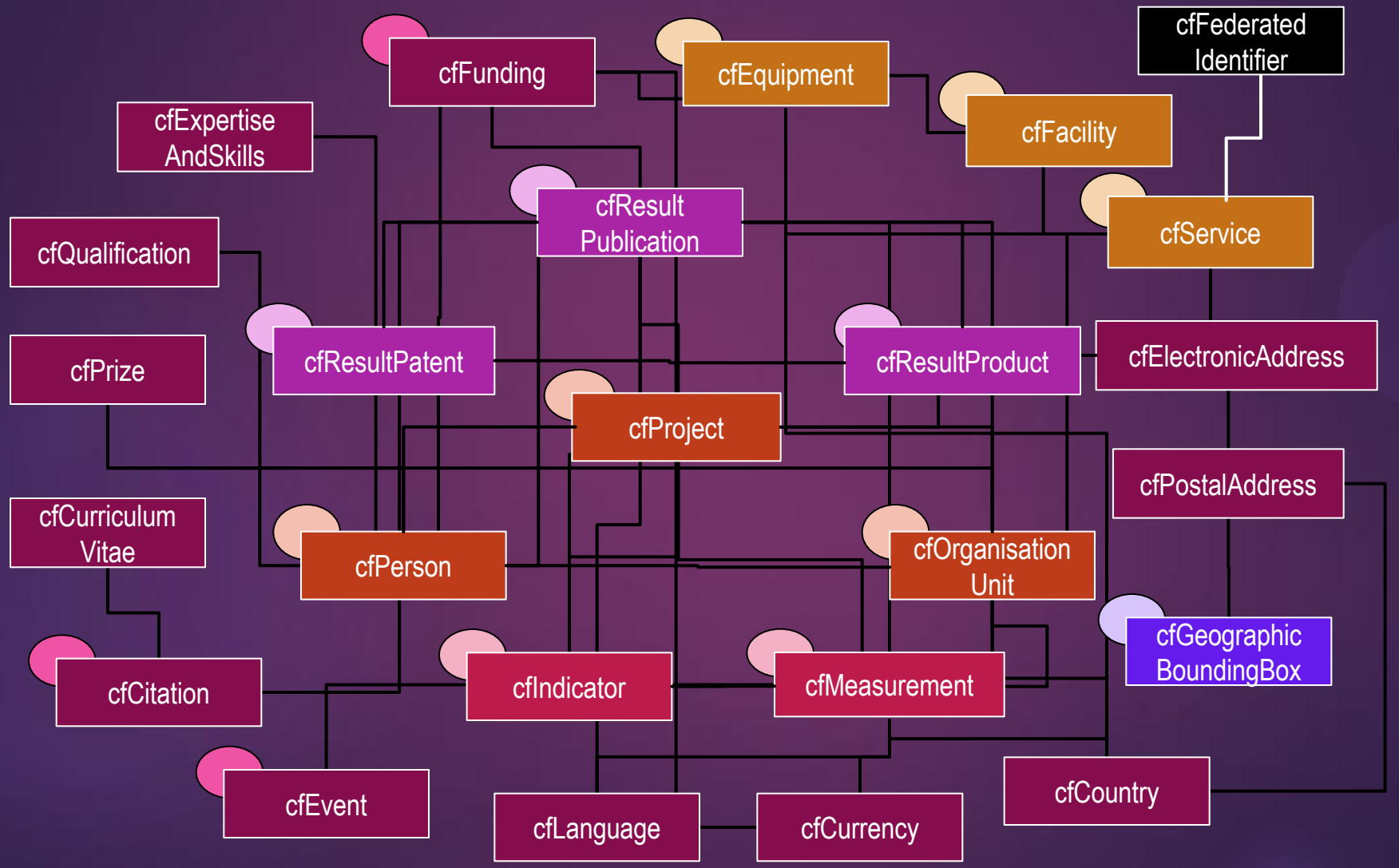
CERIF: Common European Research Information format

- Strong points of CERIF:
  - Broad coverage: metadata on all aspects of research information.
  - Detailed: highly normalizes.
  - Optimal relational architecture. Basic principle: expressing properties and semantics of the information objects and their relations by means of time-stamped links (linking entities) between the entities instead of as attributes of the entities. This makes the model very flexible and scalable:
    - Any number of relations can exist and be expressed between information objects in the model (e.g. various roles of a person in research at the same time)
    - Any level of granularity of the metaddata can be expressed. E.g. the role of a researcher concerning a publication can both be expressed according to the low-grained DC (creator, contributor) or by means of a more fine-grained classification (1st author, author, editor, reviewer, conductor of the experiment, etc...).
  - A separated "semantic layer" allowing the use of multiple (any) controlled vocabularies (classifications, typologies) as well as their cross-linking and mapping.
  - Multi-lingual.

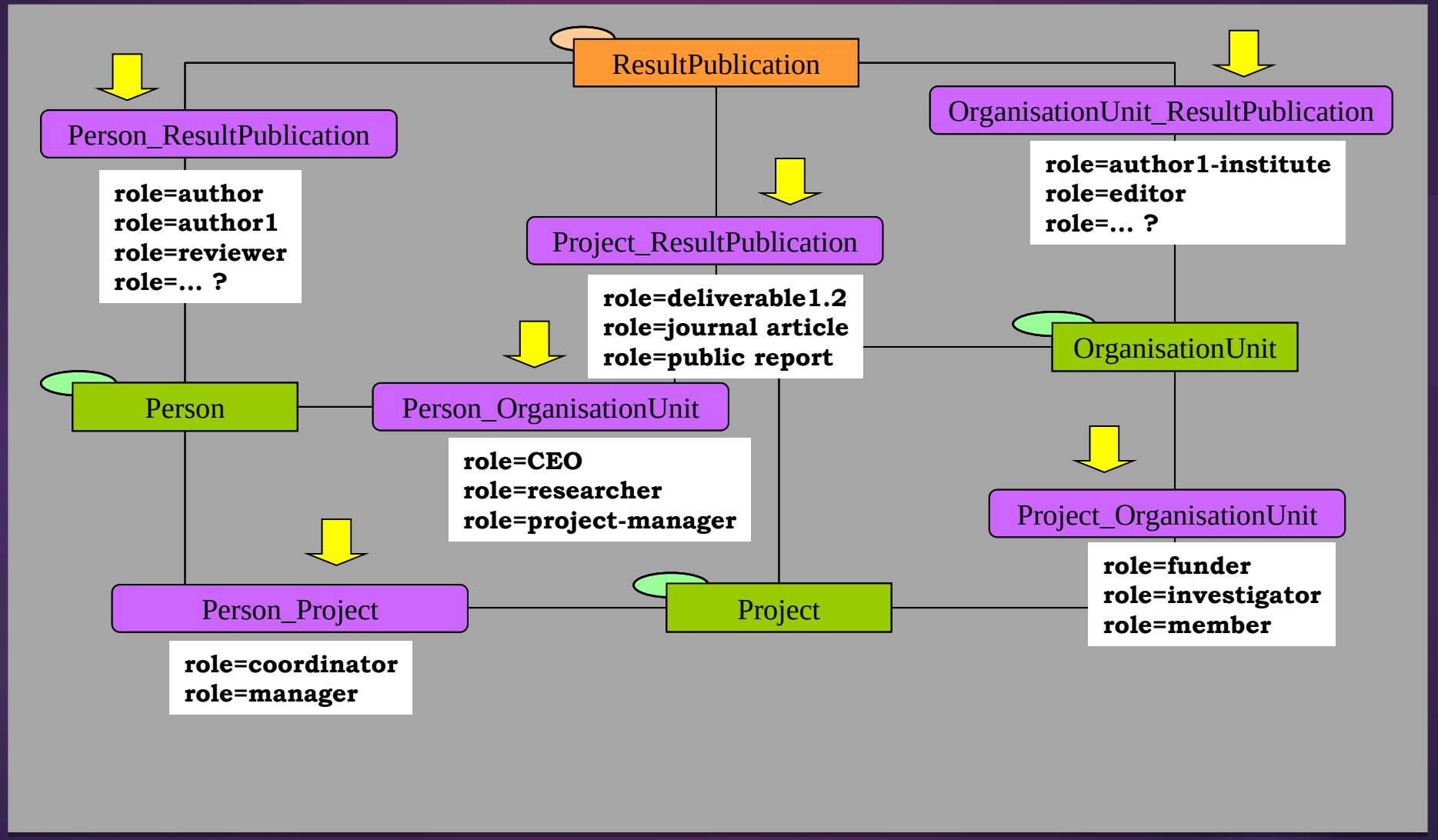
CERIF Metadata Model: broad coverage

- *Persons* involved in the research and their possible roles (researcher, manager,…)
- *Organizations* involved: research institutions, funding agencies, partners, customers,…
- *Projects*: content description, academic domain, period, language, …
- *Input:* both in terms of human (fte's) and financial resources.
- *Output*: publications, patents, products, contributions to events, services rendered,…
- *Datasets used/produced:* identification, volume, location, access/use rights, …
- *Equipment and services used/produced* in the research.
- *Metrics*: number of publications, citations, grants, awards, etc…
- *Impact* on society: economic, health, climate…
- *Semantic definitions:* controlled vocabularies, both for formal-administrative (e.g. typologies of roles in research or publication types) and content-related (e.g. taxonomies for a given scientific domain) characterization and clarification.

CERIF Metadata Model: broad coverage



CERIF Metadata Model: optimal architecture



CERIF Metadata Model: optimal architecture

	VeId	Type
☐	cfResPublId	char(128)
☐	cfClassId	char(128)
☐	cfClassSchemeId	char(128)
☐	cfStartDate	datetime
☐	cfEndDate	datetime
☐	cfFraction	double

cfResPubl_Class
For expressing
Classification of Publication
(e.g. the scientific field or subject area it belongs to)

	VeId	Type
☐	cfPersId	char(128)
☐	cfOrgUnitId	char(128)
☐	cfClassId	char(128)
☐	cfClassSchemeId	char(128)
☐	cfStartDate	datetime
☐	cfEndDate	datetime
☐	cfFraction	double

cfPers_OrgUnit
For expressing
Role of a Person in an Organization

CRIS: Current Research Information Systems

Integrated in the CERIF-solution are:

- CERIF-XML: for interoperability between CRIS and other RI systems and applications (e.g. OA Repositories).
- The ORCID unique researcher identifier.
- CASRAI dictionariy definitions and profiles.

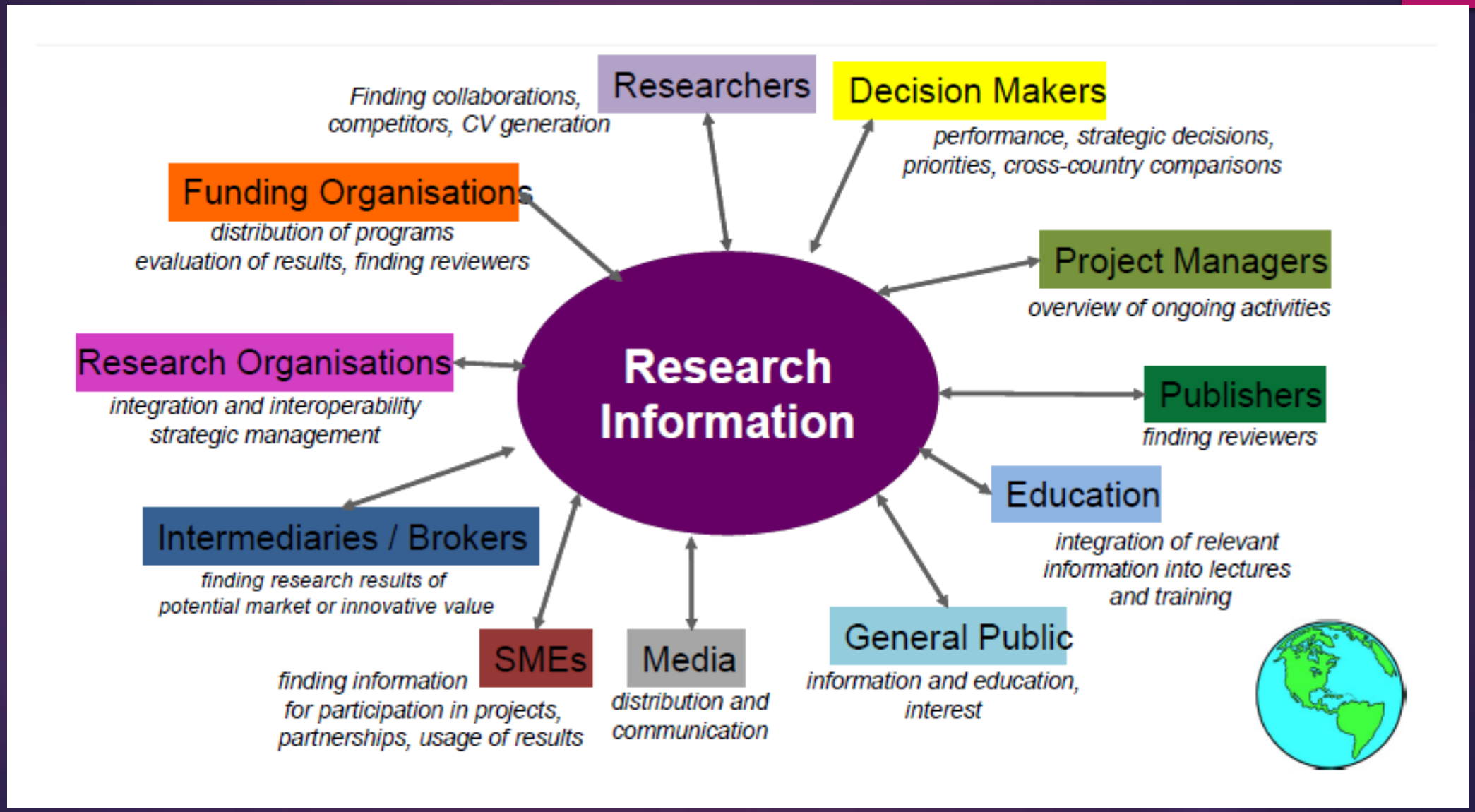
CRIS: Current Research Information Systems

On top of CERIF research information systems (CRIS) were/are being built that – in the course of time – evolved from mere research assessment systems to multipurpose systems that can deliver a multitude of services to the various stakeholders in the research information ecosystem.

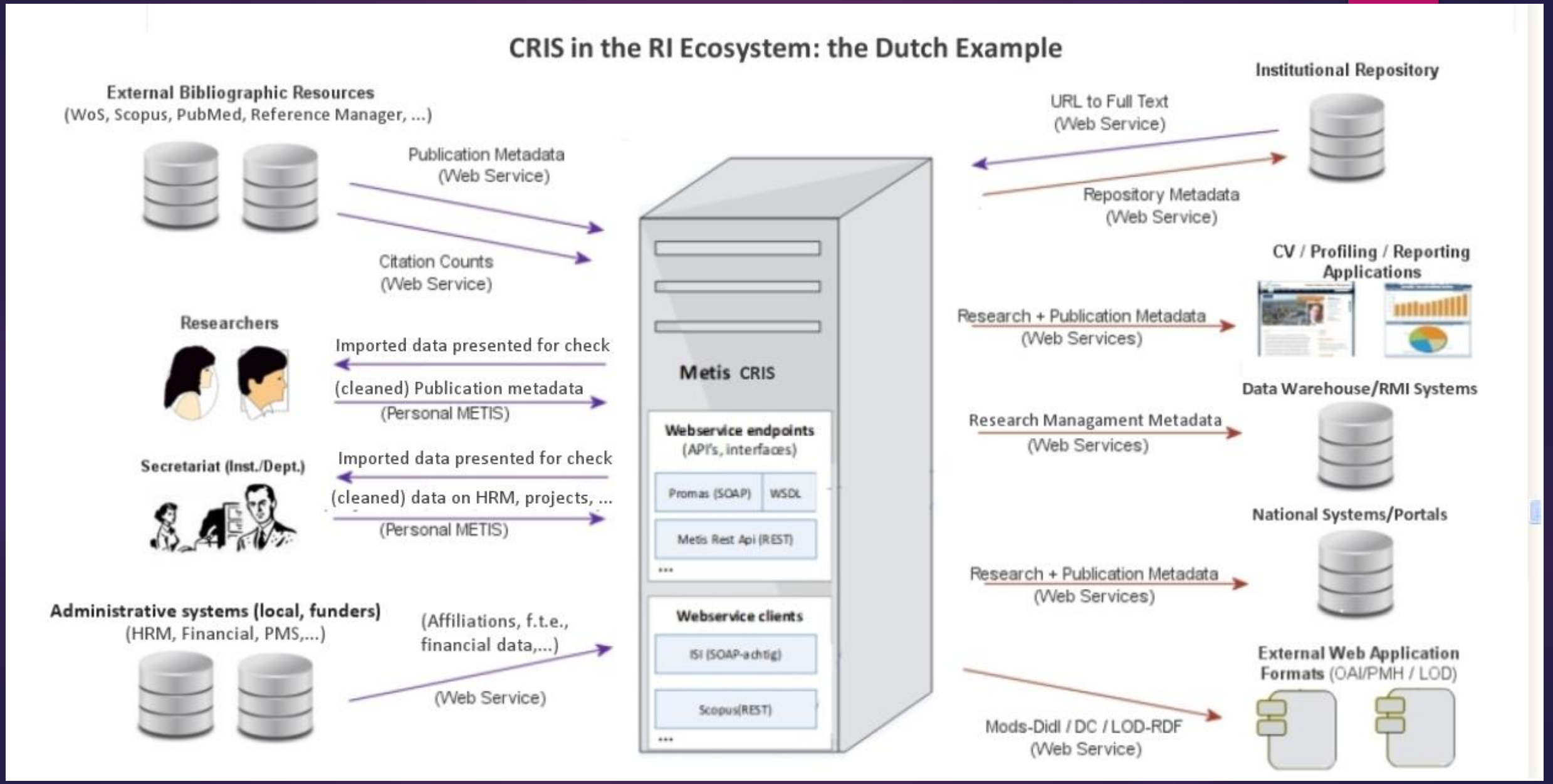
Currently some 150-200 implementations of CRIS in Europe.

euroCRIS
Current Research Information Systems

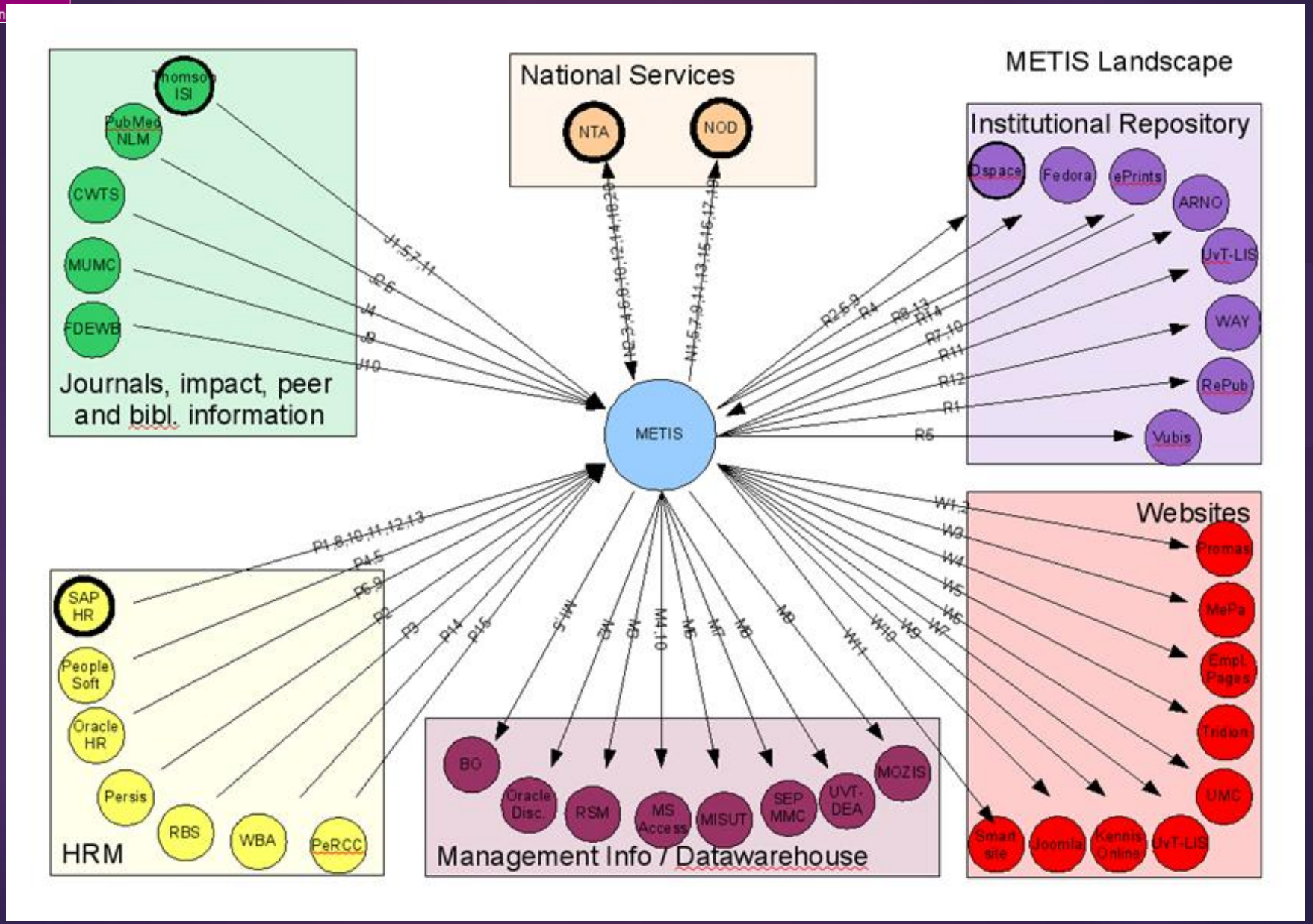
Research Information: stakeholders



NL: Central position of CRIS in RI environment



NL: Central position of CRIS in RI environment



NL: CRIS output for SEP: Standard Evaluation Protocol

table 5.2 Research staff at institutional and programme level

Entire Institu
Tenured staff (
Non-tenured s
PhD-candidate
Total researc
Support staff
Visiting fellov
Total staff
Research pro
Tenured staff (
Non-tenured s
PhD-candidate
Total researc
Research pro
...

Note 1: Comp
Note 2: Comp
Note 3: Stand

table 5.3 Main categories of research output at institutional and programme level

Entire Insti	Year-5	Year-4	Year-3	Year-2	Year-1	Year now
Refereed art						
Non-referee						
Books						
Book chapte						
PhD-theses						
Conference						
Professional						
Publications						
Other resear						
Total public						
Research pr						
Refereed art						
Non-referee						
Books						
Book chapte						
PhD-theses						
Conference						
Professional						
Publications						
Other resear						
Total public						
Research pr						

Note 1: Artic
Note 2: Publ
ing patents c
Note 3: Also
Note 4: Othe
(e.g. engineering) and "media c

table 5.4 Funding at institutional and programme level

Entire Institut
Funding:(1)
Direct funding
Research grant
Contract resear
Other (5)
Total funding
Expenditure:
Personnel costs
Other costs
Total expendi
Research prog
Funding:
#1 <name prog
#2 <name prog
#3 <name prog
.....
Total Funding

Note 1: Numbe
5.2.
Note 2: Direct
Note 3: Resear
KNAW and Eu
Note 4: Resear
governmental
Note 5: Funds

table 5.5 Standard PhD-Candidates (1)

Enrolment				**Succes rates**				**Total**		
Start-ing year	Enrol-ment (male / female)		Total (male+ female)	Gradu-ated after (≤) 4 years	Gradu-ated after (≤) 5 years	Gradu-ated after (≤) 6 years	Gradu-ated after (≤) 7 years	Total gradu-ated	Not yet finished	Discon-tinued
T-8	*#M*	*#F*	#	# / %	# / %	# / %	# / %	# / %	# / %	# / %
T-7	*#M*	*#F*	#	# / %	# / %	# / %	# / %	# / %	# / %	# / %
T-6	*#M*	*#F*	#	# / %	# / %	# / %	-	# / %	# / %	# / %
T-5	*#M*	*#F*	#	# / %	# / %	-	-	# / %	# / %	# / %
T-4	*#M*	*#F*	#	# / %	-	-	-	# / %	# / %	# / %

Note 1: Standard PhD-candidate with employee status and conducting research with primary aim/obligation to graduate; (AiO, promovendus)

table 5.6 Contract PhD-candidates (1)

Enrolment				**Success rates**				**Total**		
Start-ing year	Enrol-ment (male / female)		Total (male + fe-male)	Gradu-ated after (≤) 4 years	Gradu-ated after (≤) 5 years	Gradu-ated after (≤) 6 years	Gradu-ated after (≤) 7 years	Total gradu-ated	Not yet finished	Discon-tinued
T-8	*#M*	*#F*	#	# / %	# / %	# / %	# / %	# / %	# / %	# / %
T-7	*#M*	*#F*	#	# / %	# / %	# / %	# / %	# / %	# / %	# / %
T-6	*#M*	*#F*	#	# / %	# / %	# / %	-	# / %	# / %	# / %
T-5	*#M*	*#F*	#	# / %	# / %	-	-	# / %	# / %	# / %
T-4	*#M*	*#F*	#	# / %	-	-	-	# / %	# / %	# / %

Note 1: Contract PhD-candidates without employee status, receiving external funding or university scholarship, conducting research under the authority of the institute with primary aim to graduate; (beurspromovendus)

NL: Researcher Profiles/CV's generated from CRIS

MyERIM

Erasmus Research Institute of Management

ERASMUS UNIVERSITEIT ROTTERDAM

About | People | Research | Funding | Facilities | Publications | Doctoral Programme | News | Events | Contact | Search

ERIM home › People

Full Professor

D.L. (Daan) van Knippenberg

Professor of
Organizational Behavior

Department of Organisation and Personnel Management

Rotterdam School of Management (RSM)

Erasmus University Rotterdam

T: +31 10 4082538

E: dvanknippenberg@rsm.nl

Programme:
Organisation

ERIM Membership:
Fellow ERIM (since 2003)

▸ Profile

▾ Publications (161)

Key publications (4)

Hirst, G., van Knippenberg, D. & Zhou, J. (2009). A cross-level perspective on employee creativity: Goal orientation, team learning behavior, and individual creativity. *Academy of Management Journal, 52*(2), 280-293.

van Knippenberg, D. & Schippers, M.C. (2007). Work group diversity. *Annual Review of Psychology, 58*, 515-541.

van Knippenberg, D., de Dreu, C.K.W. & Homan, A. C. (2004). Work group diversity and group performance: An integrative model and research agenda. *Journal of Applied Psychology, 89*(6), 1008-1022.

van Knippenberg, D. & Hogg, M.A. (2003). A social identity model of leadership effectiveness in organizations. *Research in Organizational Behavior, 25*, 243-295.

▸ Articles (113)

▸ Books (5)

Centres

Leadership

Latest publication

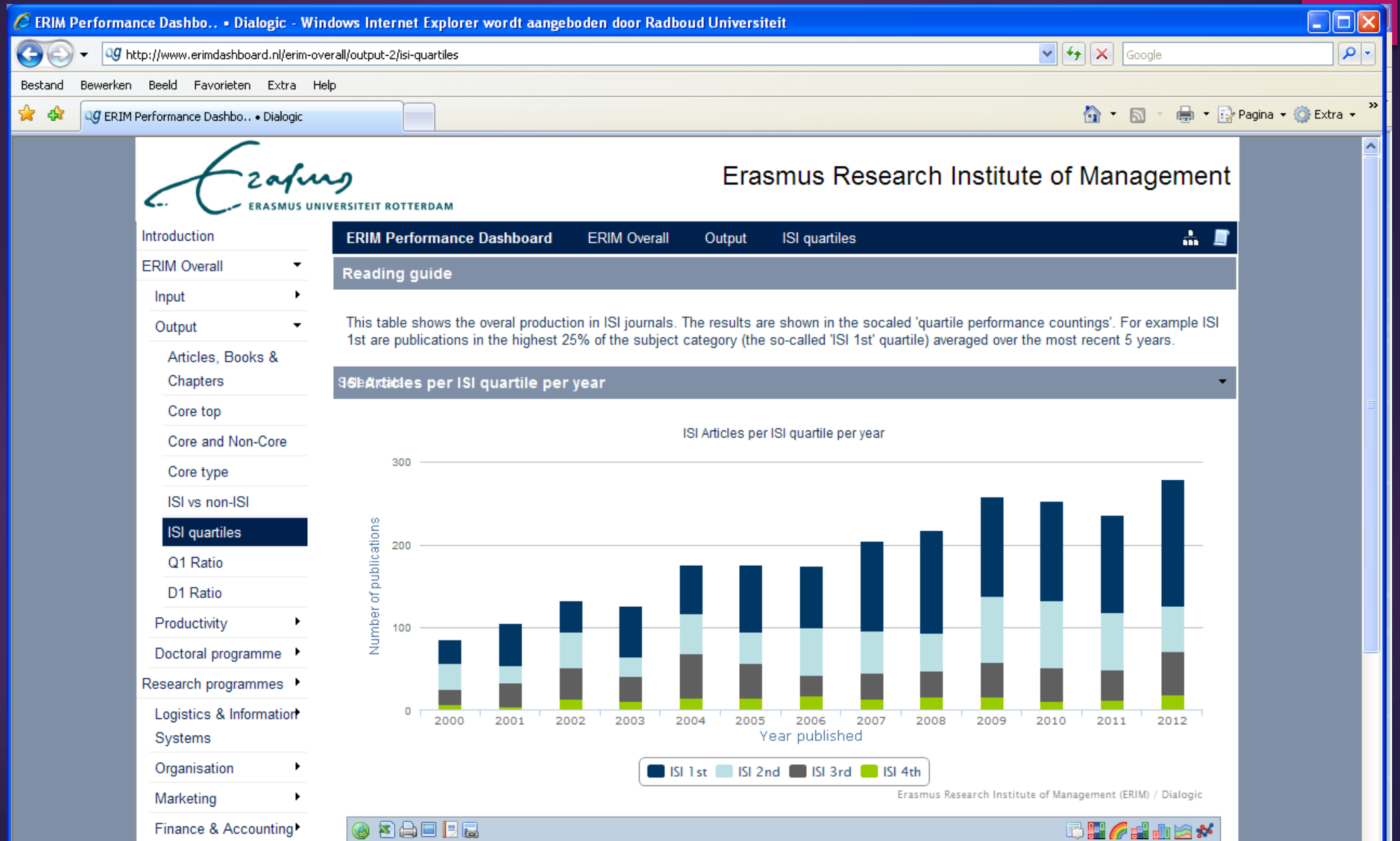
Kollée, J.A.J.M., Giessner, S.R. & van Knippenberg, D. (2013). Leader evaluations after performance feedback: The role of follower mood. *The Leadership Quarterly, 24* (1), 203-214.

Latest news

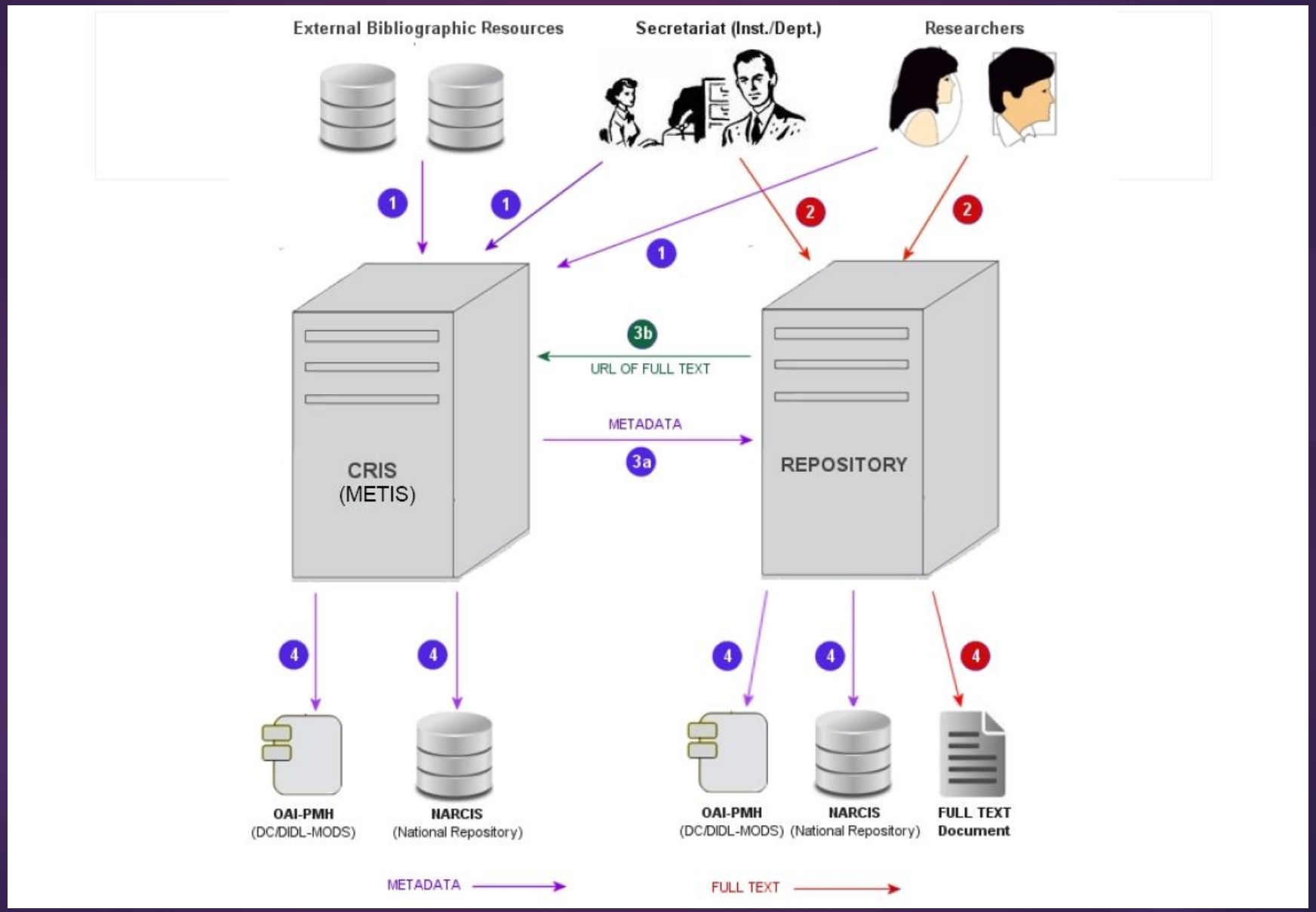
PhD Defence: Morality in Interactions: On the Display of Moral Behavior by Leaders and Employees

In her PhD thesis entitled Morality in Interactions: On the Display of Moral Behavior by Leaders and Employees, Suzanne van Gils analyses the interplay between employees and their organisational environment.

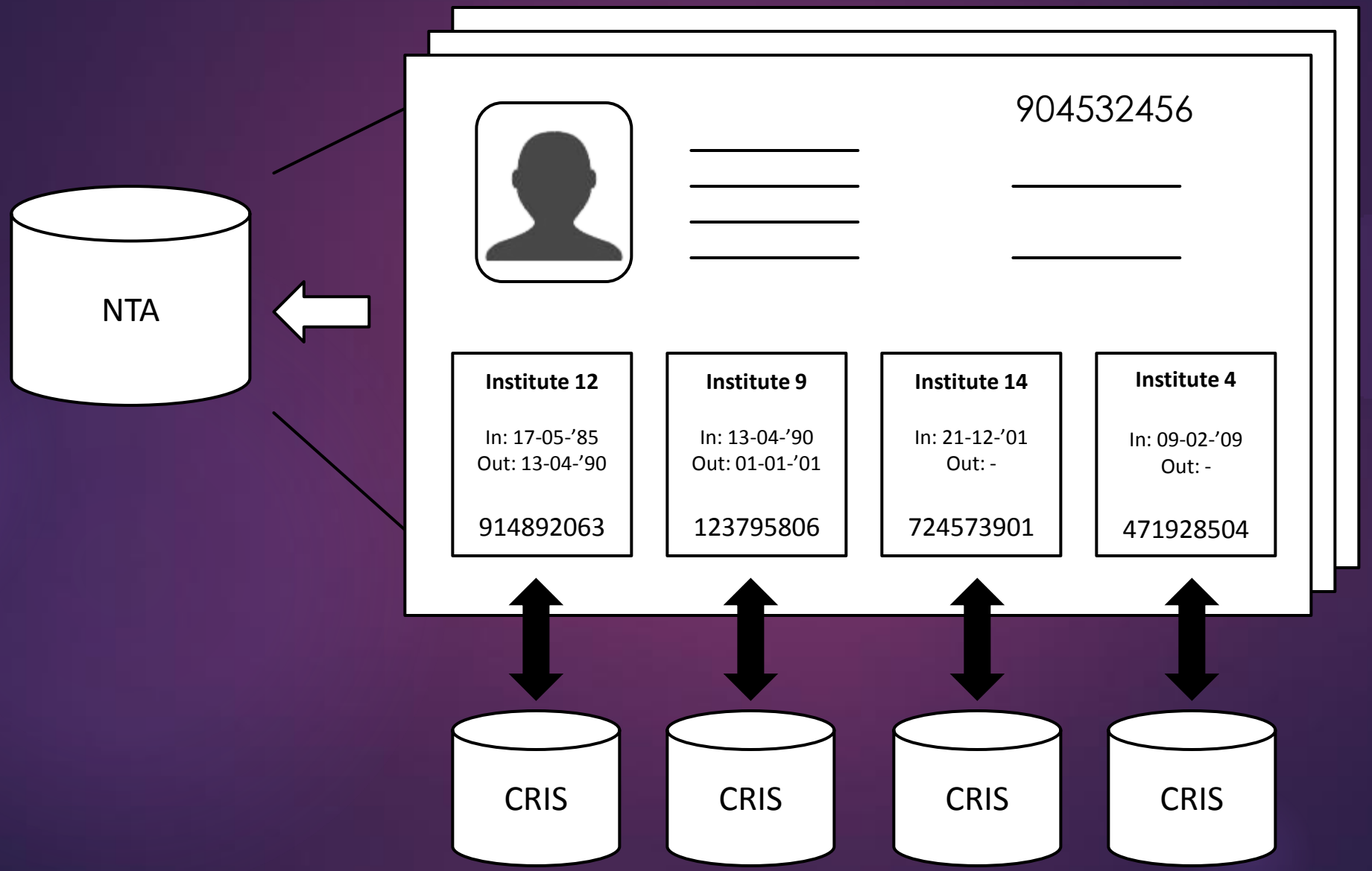
NL: Insitution/Research Profiling Dashboard based on CRIS



NL: CRIS-Repository Interaction



NL: DAI – Digital Author Identifier



UK: MICE: Measuring Impact in CERIF

MICE: a UK project to define societal (economic, health, climate, etc..) impact indicators for research (2011).

Outcome: A broad taxonomy of impact indicators has been defined and the CERIF model has been extended in order to be able to deal with these impact indicators.

- Economic
- Environment
- Health
- Social
- Cultural
- Legal
- Public policy
- .....

MICE: Measuring Impact in CERIF

Impact indicators

economic and commercial (3)

economic

impact on business (1)

improving performance of existing businesses (1)

increased turnover (1)

time savings (3)

reduced costs (1)

fuel savings

success measures for new products (1)

revenue growth

reduced financial risk

increased productivity

MICE: Measuring Impact in CERIF

social/cultural/environmental (3)

environmental

sustainable development (1)

environmental sustainability (1)

reduced pollution (1)/ waste (3)

recycling rates (3)

improved waste management (3)

reduced consumption of natural resources (3)

regeneration of natural resources (1)

new technologies/processes/services (1)

monitoring (2)

risk assessment (2)

behavioural changes (1)

MICE: Measuring Impact in CERIF

health

- health sector (1)
  - improved patient care (1)
    - *reduced treatment times (1)*
    - *reduced treatment costs (1)*
    - *equal access to services (1)*
    - *changes to clinical/healthcare training/practice/guidelines (1)*
    - *new or improved drugs (1)*
    - *new or improved treatments/medical interventions (1)*
    - *number of advanced phases clinical trials (1)*
  - changes to clinical policy (2)
  - improved heath outcomes (1)
    - *lives saved (1)*
    - *reduced infection rates (1)*
    - *improved quality of life for patients (2)*

UK: CERIF-ying the Snowball Metrics

euroCRIS currently is involved in a project with Elsevier and a few universities from the UK aimed at expressing the “Snowball Metrics” in CERIF.

Snowball Metrics: a set of indicators for inter-institutional benchmarking of research.

euroCRIS
Current Research Information Systems

Snowball Metrics

GLOBAL STANDARDS FOR INSTITUTIONAL BENCHMARKING

www.snowballmetrics.com

WHAT ARE SNOWBALL METRICS?

- Metrics that support institutional strategic decision making through benchmarking
- Defined and agreed by higher education institutions themselves
- Aspire to become global standards and cover the entire spectrum of research activities
- Tested methodologies are freely available and can be generated by any organization
- Can be generated independent of data source

WHY IS THIS INITIATIVE IMPORTANT TO THE HIGHER EDUCATION SECTOR?

- A myriad of metrics is available, compounded by many similar versions of the same metric
- Difficult to know which metric will give the most useful insights, whether a metric is being calculated appropriately, or whether other institutions are looking at things in the same way
- Built by the sector, Snowball Metrics create consistency and facilitate benchmarking between peer institutions
- The Snowball Metrics initiative invites all research institutions, funding agencies, government groups and suppliers to apply the framework

euroCRIS
Current Research Information Systems

Snowball Metrics

GLOBAL STANDARDS FOR INSTITUTIONAL BENCHMARKING

www.snowballmetrics.com

PROJECT PARTNERS

- University of Oxford
- University College London
- University of Cambridge
- Imperial College London
- University of Bristol
- University of Leeds
- Queen's University Belfast
- University of St Andrews
- Elsevier

euroCRIS
Current Research Information Systems

Snowball Metrics

GLOBAL STANDARDS FOR INSTITUTIONAL BENCHMARKING

www.snowballmetrics.com

INPUT METRICS

- Applications Volume
- Awards Volume

PROCESS METRICS

- Income Volume
- Market Share

OUTPUT METRICS

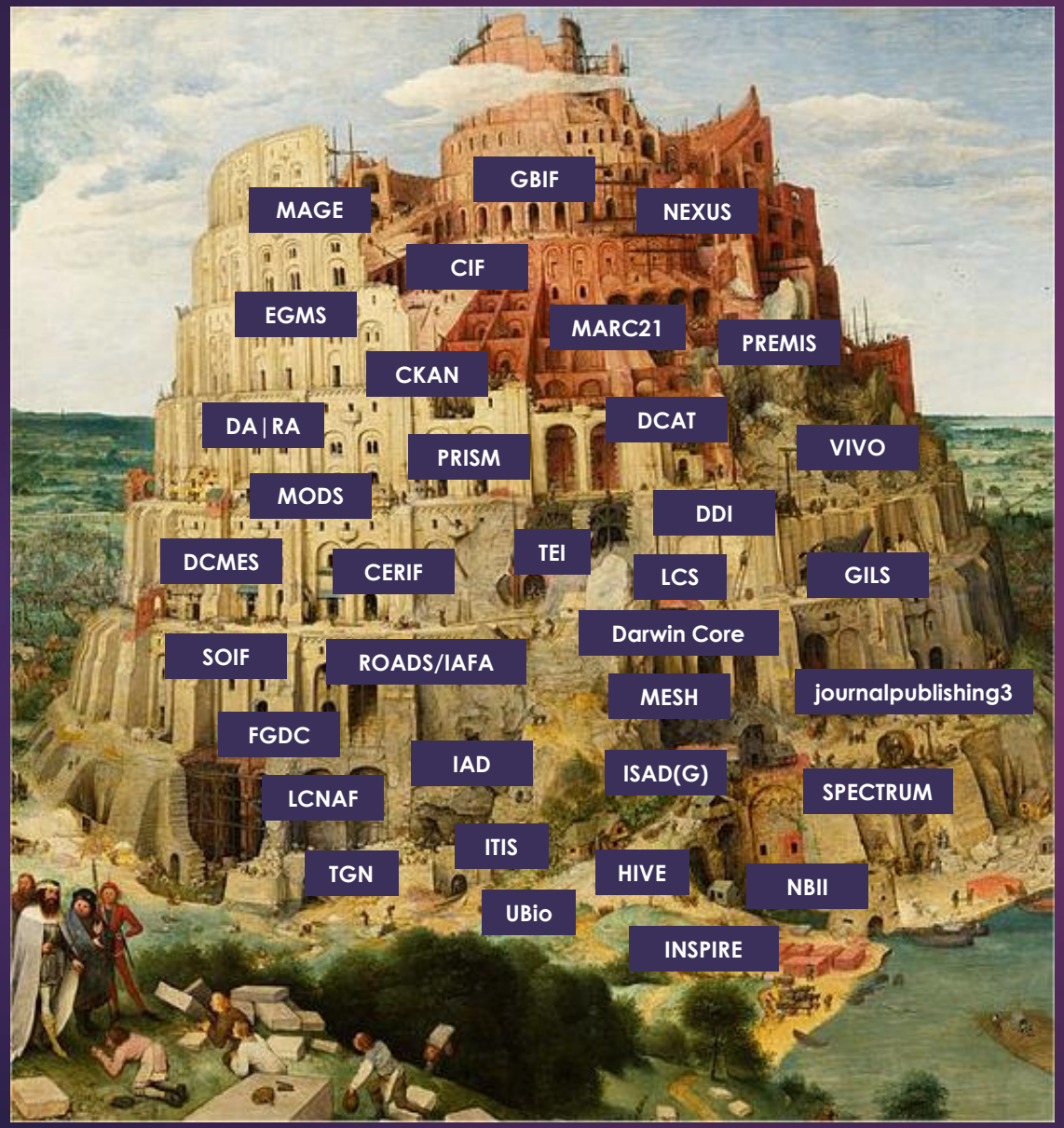
- Scholarly Output
- Citation Count
- *h*-index
- Field-Weighted Citation Impact
- Outputs in Top Percentiles
- Collaboration

Spain: expressing the CVN in CERIF

euroCRIS is currently involved in a project with FECYT to express the “normalized CV” (CVN) for researchers, a CV-format used in the whole of Spain.

A first draft version is ready. This means that it will be possible to directly generate the CVN from the metadata in a CRIS based on CERIF.

Challenges



A plethora of metadata models and formats exists within the research information domain, both concerning "generic" aspects (i.e. metadata applicable to all disciplines) as well as "discipline- or subject-specific" metadata (controlled vocabularies that hold content- or aspect-specific classifications related to a given scientific discipline or research subject e.g. the MeSH-classification for Medical Sciences).

Challenges for euroCRIS and CERIF

- To intensify and optimize our relationship with “neighbouring” stakeholders in the Research Information Ecosystem: CASRAI, ORCID, VIVO, RDA, Lattes, Repository community, ….

- Promote the use and implementation of the CERIF data model, also outside of Europe.

- Data quality:
  - On time and up-to-date availability of research information data is often a problem.
  - Data quality in external resources is often questionable, also with the “big guys” (Scopus, WoS). E.g. errors concerning affiliations of researchers, multiple “unique” identifiers). Leading to time-consuming and costly data cleaning and validation.
  - Relying on external resources holds the risk of loosing accountability ownership.

- Combining/integrating the possibilities of CRIS with new, emerging technologies (big data analysis, visualisations, …).

Conclusions

- euroCRIS has developed a (metad)data model – CERIF - that covers most aspects of research information.
- This data model is widely being accepted and implemented as the standard for registration and interoperatbility of research information in European countries.
- Given the broad coverage and the architecture of CERIF, CRIS can perform a pivotal or “spider in the web” (interoperability) function in the research information ecosystem
- Apart from being an “interoperability engine”, CERIF-CRIS can perform multiple services to the various stakeholders or use cases in the RI domain, including the aspect of metrics and impact measurement.

euroCRIS
Current Research Information Systems

Thank you for your attention!

And be welcomed to cooperate with or become a member of euroCRIS
www.eurocris.org

First step: to CERIF-y the STAR Metrics?