International Seminar on Standardization of IR Usage Statistics: How we count the access to institutional repositories

National Institute of Informatics, Tokyo
January 11, 2011

Initiated by: Ulrich Herb
Saarland University and State Library, Germany
u.herb@sulb.uni-Saarland.de

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Overview

- IR development in Europe and Germany
- Impact measures
  - Citation vs. Usage
- Usage Metrics: Standards?
- Open Access Statistics (OAS)
  - Aims
  - Technical infrastructure
  - Results & outlook
  - Repository usage statistics: The European perspective
IR development in Europe and Germany
IR development in Europe and Germany

Proportion of Repositories by Country

Europe

- United Kingdom (183 = 22%)
- Germany (142 = 17%)
- Spain (68 = 8%)
- France (57 = 7%)
- Italy (57 = 7%)
- Norway (42 = 5%)
- Sweden (41 = 5%)
- Portugal (33 = 4%)
- [25 Others (209 = 25%)]

Total = 832 repositories

taken from www.opendoar.org

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IR development in Europe and Germany

Usage of Open Access Repository Software
Europe

- DSpace (244 = 29%)
- EPrints (177 = 21%)
- [Unknown] (165 = 20%)
- OPUS (54 = 6%)
- Diva-Portal (23 = 3%)
- Open Repository (16 = 2%)
- dLibra (13 = 2%)
- HAL (12 = 1%)
- [48 Others (128 = 15%)]

Total = 832 repositories

taken from www.opendoar.org

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## IR development in Europe and Germany

<table>
<thead>
<tr>
<th>Country</th>
<th>Platform</th>
<th>UK</th>
<th>France</th>
<th>Germany</th>
<th>Italy</th>
<th>Spain</th>
<th>Netherlands</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>EPprints</td>
<td>44%</td>
<td>proprietary tools</td>
<td>47%</td>
<td>OPUS</td>
<td>proprietary tools</td>
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<td></td>
<td></td>
<td>DSpace</td>
<td>19%</td>
<td>HAL</td>
<td>19%</td>
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<td></td>
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<td>proprietary tools</td>
<td>16%</td>
<td>EPrints</td>
<td>18%</td>
<td>proprietary tools</td>
<td>11%</td>
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<tr>
<td></td>
<td></td>
<td>Open Repository</td>
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<td>DSpace</td>
<td>11%</td>
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<td>EPrints</td>
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</table>

taken from [www.opendoar.org](http://www.opendoar.org)
IR development in Europe and Germany

- Heterogeneous software landscape with some “local heroes”

- Creating incentives (metrics, scientific capital)

- European repository community takes strong efforts in interlinking and integration of repositories
  ... both on the technical and the service layer (DRIVER, COAR) and at the level of funding agencies (Knowledge Exchange)

- Integration into
  ... academic workflows (SWORD, SONEX)
  ... academic and administrative information systems (current research information systems, project databases)
  ... Social Networks (ResearchGate, Mendeley, ...)

... do repositories really need an user interface?
IR development in Germany

- 200+ institutional and disciplinary repositories
  - Various repository platforms operational
  - Large differences in design, size of collections, and coverage
  - Heterogenous types of content

- Enhancement of content visibility on a national and international level by various means
  - Widespread implementation of OAI-PMH, but still deficits in standardization and data harmonization
  - Prominent repository registries, repository collaborations, search engines

Registry of Open Access Repositories (ROAR)

IR development in Germany

- Open-Access-Network
  German research institutions interlink their Open Access repositories and create an overarching collection of publications through the information infrastructure of OA Network
  http://www.dini.de/projekte/oa-netzwerk/

- Standardization and stimulation of IR development
  DINI Certificate for document and publication services
  DINI = German Initiative for networked information
  http://www.dini.de/english/dini-certificate/
Impact Measures
Impact measures: relevance

Individual level: *publish or perish*

If you do not publish you do not have any scientific capital, reputation or impact
Without any impact, you won’t make your career

Organisational level: evaluation

Evaluation results determine prospective resources of institutes *and* the future main research
Criteria: number of doctoral candidates, amount of third party funds, publications
Scientific reputation (or scientific capital) is derived from publication impact

Impact is calculated mostly by citation measures
- Journal impact factor (JIF)
- Hirsch-index (h-index)

Especially within the STM domain
Citation impact: calculation

**JIF**

In year \(X\), the impact factor of a journal \(Y\) is the average number of citations to articles that were published in \(Y\) during the two years preceding \(X\).

Garfield: „*We never predicted that people would turn this into an evaluation tool for giving out grants and funding.*“ From: Richard Monastersky (2005), The Number That's Devouring Science *The Chronicle of Higher Education*

**H-index**

A scientist has index \(h\) if \(h\) of \(N\) papers have at least \(h\) citations each, and the other \((N - h)\) papers have less than \(h\) citations each.

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Citation impact: some critique

- Restricted scope, exclusion of many publication types
- Based exclusively on journal citation report / web of science
- Language bias: items in English language are overrepresented within the database, so they reach higher citation scores
- JIF focuses on journals: few articles evoke most citations
- JIF discriminates disciplines with lifecycles of scientific information > 2 years

→ Mixture of quality and popularity
Impact measures: a categorization

- Citation based measures
  - Author-centred
  - Delayed measurement: at first in the following generation of publications
  - Impact of a separate object is mostly not described

- Usage based measures
  - Reader-centred
  - Measuring: on-the-fly and consecutive
  - Impact of a separate object can be described
  - Automated measurement is possible
Impact measures: a categorisation, pt. II

JIF = Journal Impact Factor

RF = Reading Factor

SA = Structure Author
• based on networks built by authors and their activities, e.g. Google PageRank, citation graphs, webometrics

SR = Structure Reader
• based on document usage and its contextual information, e.g. recommenders, download graphs

Usage Metrics: Standards?
Usage based impact: standardisation?

- **COUNTER**
  
  Counting Online Usage of Networked Electronic Resources
  
  [http://www.projectcounter.org](http://www.projectcounter.org)

- **LogEc**
  

- **IFABC**
  
Usage based impact: standardisation?

- The models mentioned differ in many aspects
  - Detection and elimination of non-human access (robots, automatic harvesting)
  - Definition of double click intervals
  - ...

- General problems
  - Ignorance of context information
  - Detection of duplicate users
  - Detection of duplicate information items
  - Ignorance of philosophical questions like: “What degree of similarity makes two files the same document?”
Alternative impact measures: conclusion

- Alternative impact measures are possible

- But: very little standardisation

- Promising, but complex examples/models like MESUR
  [http://www.mesur.org](http://www.mesur.org)

- Requirement: sophisticated infrastructure to generate and exchange interoperable usage information within a network of several different servers
Project: Open Access Statistics
Open Access Statistics (OAS)

- 07/2008 – 02/2010
- Project partners

Initiated by:

Funded by:

http://www.dini.de/projekte/oa-statistik/english/

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OAS: Aims

- A common standard to exchange usage date between different services
- An infrastructure to collect, process and exchange usage information between different services
- Usage information should be processed according to the standards of COUNTER, LogEc and IFABC
- Additional service for repositories
- Implementation guidelines
OAS: Associated projects

- Open Access Statistics
- DOARC (Distributed Open Access Reference and Citation Services)
- Open Access Network
Technical Infrastructure
OAS: Background

- Data pools at partner institutions
- Aggregation of usage events in a central service provider
- Services provided by the central service provider
- Usage data will be retransferred
OAS: Data provider

Collect
- Hits
- Log File

Prepare
- Link with Local Identifiers
- Transform into OpenURL ContextObjects

Provide
- OAI-PMH Data-Provider for Usage Data

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OAS: Service provider

Collect
- OAI-PMH Service-Provider for Usage Data

Prepare
- Deduplicate (Users and Documents)
- Filter Robots
- Aggregate

Provide
- Repositories
- Value-Added Services (e.g. OAN)

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OAS: Repository integration

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Results and Outlook
OAS: Lessons Learned

The requirement for a central clearing house

A lot of unnecessary data (OpenURL CO) → increase of the data size by factor ~10

Different situation with Linkresolver data
OAS: Results

Infrastructure for exchange usage statistics

Modules for OPUS- and DSpace-based repositories, other products can be configured easily
(http://www.dini.de/projekte/oa-statistik/english/software/)

Specification of the data format and exchange
(http://www.dini.de/fileadmin/oa-statistik/projektergebnisse/Specification_V5.pdf)

Online demo
(http://oa-statistik.sub.uni-goettingen.de/statsdemo)

Website with further information
(http://www.dini.de/projekte/oa-statistik/english/)
OAS: Further plans → OAS 2

Aims for a possible second funding:

- Clarification of privacy issues
- Opening the OAS infrastructure to offer standardized usage statistics
- Evaluation of metrics
  - a) based on the pure frequency of usage
  - b) more sophisticated approaches
- Cooperation for international comparable usage statistics
- Offer a suitable service infrastructure
OAS: International cooperations

- SURFSure Statistics on Usage of Repositories, NL
- PIRUS Publisher and Institutional Repository Statistics, UK
- Knowledge Exchange Usage Statistics Group
  - Denmark’s Electronic Research Library (DEFF)
  - German Research Foundation (DFG)
  - Joint Information Systems Committee (JISC) UK
  - SURFFoundation, Netherlands

- Common sense!
  - Exchange format: OpenUrl ContextObjects
  - Transfer via OAI-PMH
  - Infrastructure based on a data provider – service provider system
  - Normalization: Robots-Detection

- COUNTER, NEEO, PEER, OAPEN ...
Thanks for your attention!

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Contact:

u.herb@sulb.uni-saarland.de
+49 681 302 2798