Open Access Statistics : an examination how to generate interoperable usage information from distributed open access services

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Initiated by:

DEUTSCHE INITIATIVE FÜR NETZWERKINFORMATION E.V.

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

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DFG

overview

- impact measures: relevance
- impact measures: some categories
- usage based impact measures: standardization?
- DFG-Project: Open Access Statistics

  - motivation, associated projects, technical issues, some results
  - outlook

impact measures: relevance

- individual level: *publish or perish*

  - a scientist that does not publish hardly has any reputation or impact

  - without any impact, he won't make his carrier

- organizational 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

from publications to impact

- 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: calculation

  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: calculation

  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

citation impact: a bunch of critiques

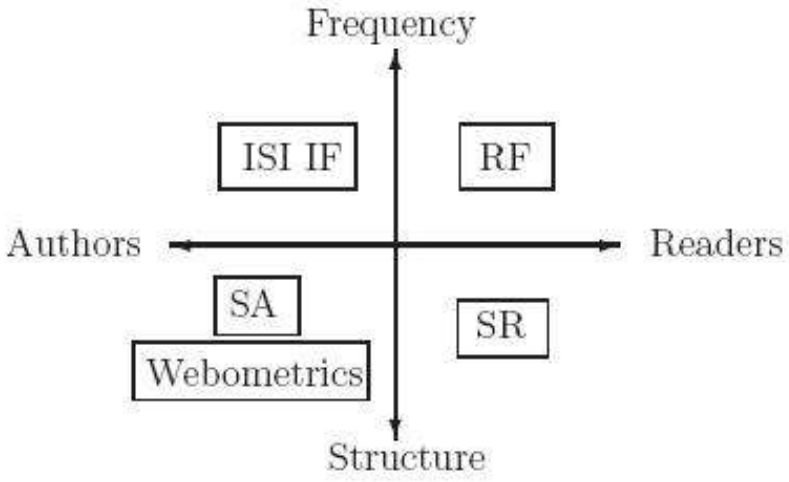
- restricted scope, exclusion of many publication types
- based exclusively on journal citation report/ web of science
- language bias: items in english language are overrepresented within the database, so they reach higher citation scores
- jif focuses on journals: few articles evoke most citations
- jif discriminates disciplines with lifecycles of scientific information > 2 years
- commixture of quality and popularity

impact measures: a categorisation

- citation based measures
  - author centred
  - delayed measurement: at the first in the following generation of publications
  - mostly: impact of an separate object is not described

- usage based measures
  - reader centred
  - measuring: on-the-fly and consecutive
  - impact of a separate object can be described
  - automatised measurement possible

impact measures: a categorisation, pt. II



ISI IF = 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**

Bollen, J. et al. (2005): Toward alternative metrics of journal impact: A comparison of download and citation data. In: Information Processing and Management 41(6): S. 1419-1440.
Preprint Online: http://arxiv.org/abs/cs.DL/0503007

usage based impact: standardisation?

- **COUNTER, http://www.projectcounter.org/**
- **LogEc, http://logec.repec.org/**
- **International Federation of Audit Bureaux of Circulations (IFABC), http://www.ifabc.org/**

Usage based impact: standardisation?

- the models mentioned differ in many respects
  - 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 (in the form of usage based measures) can be mould
- but: very little standardisation
- promising, but complex examples/models like MESUR, http://www.mesur.org/MESUR.html
- requirement: sophisticated infrastructure to generate and exchange interoperable usage information within a network of several different servers

Open Access Statistics

- funder: German Research Foundation (ger: Deutsche Forschungsgemeinschaft) DFG, http://www.dfg.de
- project partners:
  - Georg-August-University Göttingen (State- and University Library)
  - Humboldt-University Berlin (Computer- and Mediaservice)
  - Saarland University (Saarland University and State Library)
  - University Stuttgart (University Library)
- 07/2008 – 02/2010
- http://www.dini.de/projekte/oa-statistik/english/

Open Access Statistics: motivation

- open access publications are often excluded from citation based impact measures
  - repository documents by definition
  - articles in open access journals due to their short citation history and often also due to their language
- citation based impact measures are revealing several deficiencies
- citation based impact measures should be complemented by usage based impact measures
  - because a multi-faceted approach could remedy some of their deficiencies
  - because the latter ones could create an incentive to use open access services
- it needs a project to establish the required infrastructure

Open Access Statistics: aims

- implementation of a network to collect, process and exchange usage information between different services
- usage information should be processed according to the standards of COUNTER, LogEc and IFABC
- development of additional services for repositories
- development of implementation guidelines
- initially formulated by the Electronic Publishing working group of DINI (Deutsche Initiative für Netzwerkinformation / German Initiative for Network Information)

Open Access Statistics: associated projects

- Open Access Statistics addresses usage description
- Open Access Citation address the issue of tracking citations between electronic publications
- Open Access Network
  - intends to build a network of repositories
  - will bundle the results of Open Access Citation and Open Access Statistics in one user interface
  - offers services for Open Access Citation and Open Access Statistics, e.g. deduplication of documents (based on a asymmetric similarity of fulltext documents)

Open Access Statistics: background

- data pools at the partner institutions
  - open access repositories
  - linkresolver
  - licence controlling servers
- aggregation of usage information/ usage events from each single data pool in a central service provider
  - including deduplication
  - including processing according to the standards mentioned
- services provided by the central service provider
- usage data will be retransferred to distributed local repositories and to the Open Access Network service

Open Access Statistics: example

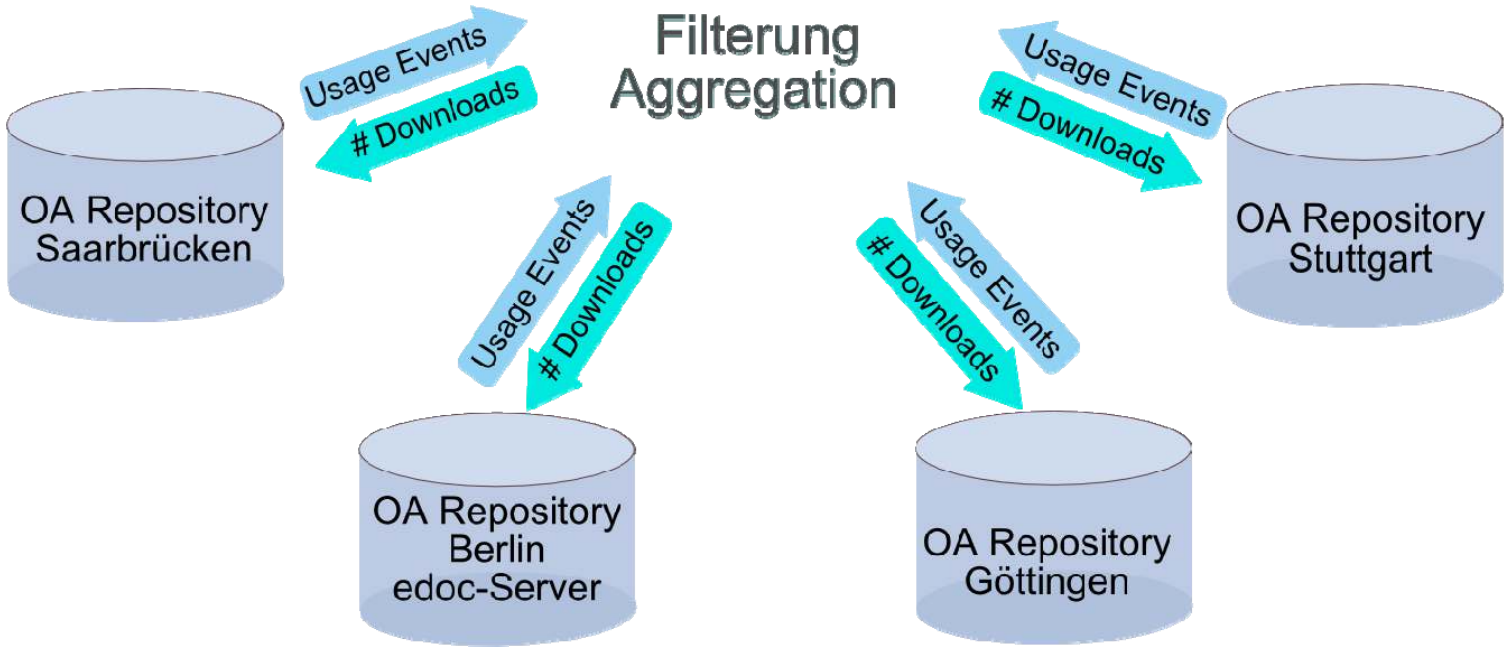
data provider (services x, y, z)

- generate logs about document usage
- pseudonymise user information (IP-addresses)
- process usage information (adds unique document ID, transforms data into OpenURL ContextObjects, …)
- transmit the information via OAI-PMH to the service provider

service provider

- receives the information
- deduplicates documents and users
- computes usage statistics according to the standards mentioned
- delivers the information to external services (search engines, etc.) and to the data provider x, y, z that generated the logs

Open Access Statistics: background



Open Access Statistics: data provider

requirements

- a defined web server configuration
- local processing of the web server logs
  - pseudonymisation
  - isolation of the local document identification
  - …
- packing of the OAI-PMH-container/ OpenURL-ContextObjects-container
  - referrent
  - reffering entity
  - requester
  - servicetype
  - resolver
  - referrer

Open Access Statistics: data provider

retransfer of processed information to the local repository

- protocol: OAI-PMH
- syntax: XML
- resolution: to be discussed (month?, weeks?, days?)
- granularity: fulltexts

Open Access Statistics: some lessons learned

linkresolvers are rarely offering suitable information

- external services (ovid) don't offer usage information
- SFX-logs are very heterogenous
  - target may be a splash page or a fulltext
- hardly any information about open access documents

document deduplication seems difficult

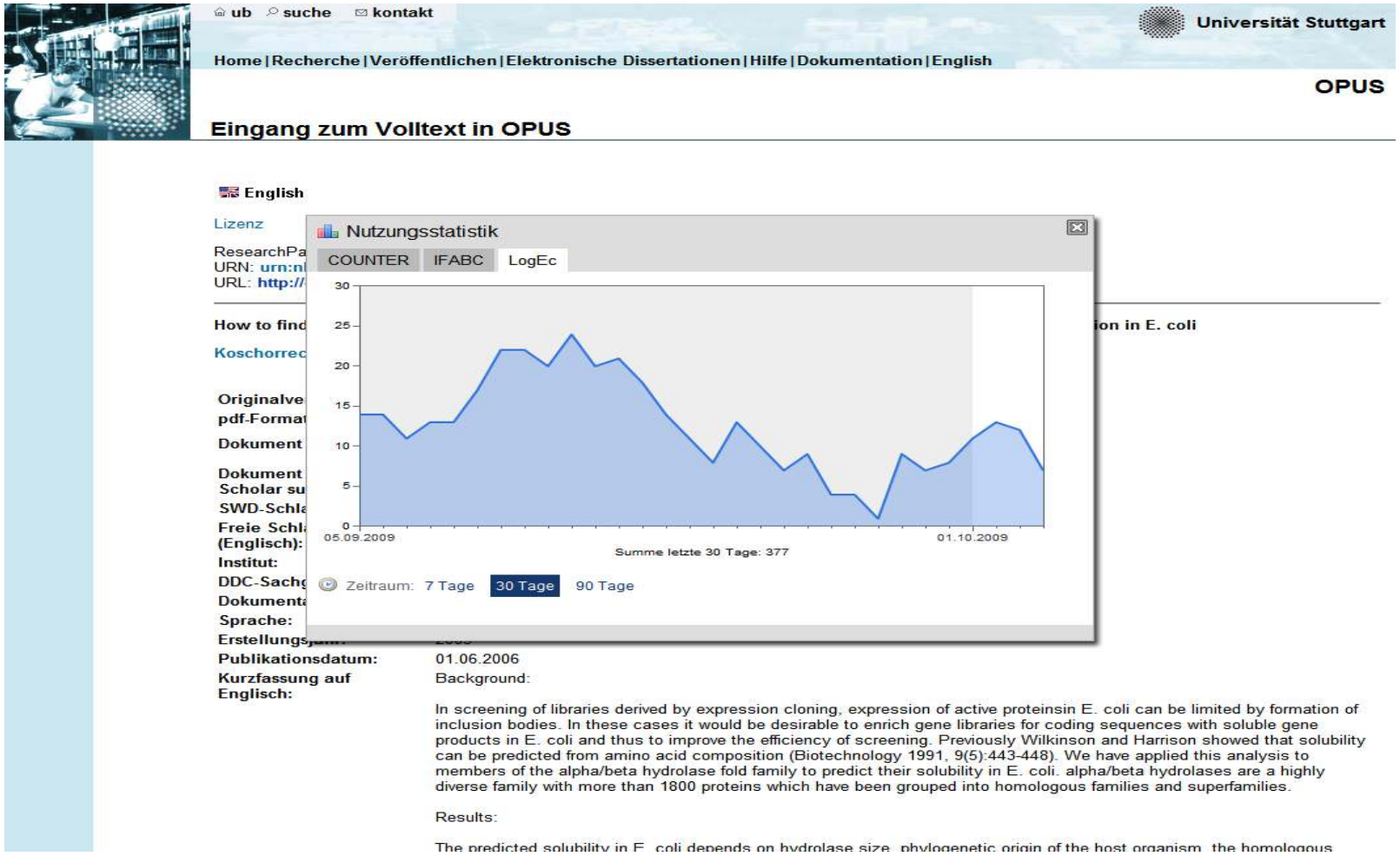
- a given document may have more than one IDs
  cause: multiple fulltext deposit on several repositories
- a given document may have several splash pages on different servers pointing at one fulltext on one single server
  cause: metadata harvesting
- …

Open Access Statistics: usage scenarios

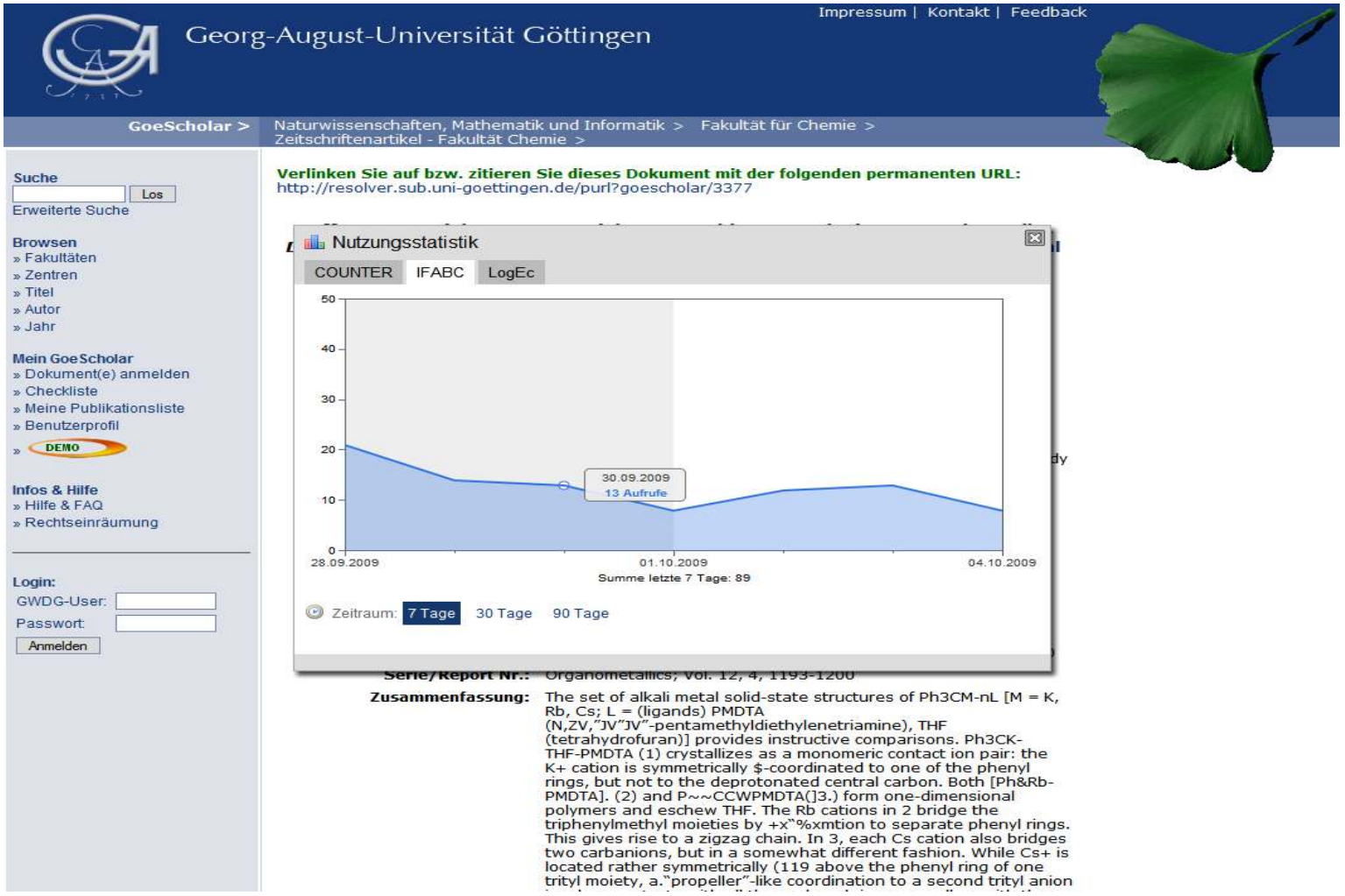
data may be used

- from an user perspective as a criterion to estimate the relevance of a document (e.g. rankings)
- from an author perspective as an indicator for the dissemination of a concept
- from a service provider perspective:
  - as additional metadata for search engines, databases …
  - as a recommender service
- from a repository perspective:
  - as a recommender service
  - as additional metadata for users

Open Access Statistics: repository integration



Open Access Statistics: repository integration



Open Access Statistics: additional information

- open access statistic will offer modules for OPUS- and DSpace-based repositories, other products can be configured easily
  - Nutzungsstatistiken elektronischer Publikationen. DINI-Schriftenreihe. DFG-Projekt Open Access-Statistik (OA-S) und DINI-Arbeitsgruppe „Elektronisches Publizieren“. Online: http://nbn-resolving.de/urn:nbn:de:kobv:11-100101174 (to be translated)
- Open Access Statistics workshop: 21.01.2010
  - http://www.dini.de/veranstaltungen/workshops/oa-statistik-was_zaehlt/
- online questionnaire on features in digital repositories
  - http://oas.sulb.uni-saarland.de/fragebogen-english.php
- online demo
  - http://oa-statistik.sub.uni-goettingen.de/statsdemo
- website with further information about the workshop, technical specifications
  - http://www.dini.de/projekte/oa-statistik/english/

Open Access Statistics: further plans

Open Access Statistics II?

possible focus:

- internationalisation
- opening the network to other contributing repositories
- opening the network to other services (e.g. journals)
- evaluation of metrics more complex than the calculation of pure usage frequencies
- …

Open Access Statistics: cooperation

- SURFSure
  Statistics on the Usage of Repositories
- COUNTER
  Counting Online Usage of Networked Electronic Resources
- PIRUS
  Publisher and Institutional Repository Usage Statistics
- NEEO
  Networkof European Economists Online
- PEER
  Publishing and the Ecology of European Research
- OAPEN
  Open Access Publishing in European Networks

Open-Access-Statistik

Thanks for your attention!

And thanks to my colleagues:
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Daniel Metje
Björn Mittelsdorf

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