



*Measuring Impact  
in an Open Access Environment*

**Frank Scholze**  
**Stuttgart University Library**

**LIBER 36th Annual Conference**  
**Biblioteka Narodowa, Warsaw, 5.7.2007**



## Research Impact

“Impact is any change resulting from an activity, project, or organization. It includes intended as well as unintended effects, negative as well as positive, and long-term as well as short-term.”

From: Susan Wainwright (2002). Measuring Impact - A Guide to Resources. NCVO.

- Qualitative vs quantitative methods to determine impact
- Peer-review, voting, “endorsement”
- Publications are the quantifiable output of the research process



## Background

- Metrics as a research policy issue
- Assessment and evaluation of research
  - Appointment decisions
  - Funding decisions
  - Monitoring trends
  - Prioritize activities and attention

Rankings are here to stay, and it is therefore worth the time and effort to get them right.

Alan Gilbert (President University of Manchester)

From: D Butler (2007) Academics strike back at spurious rankings, *Nature* 447, pp 514-515



## Open Access and Metrics

- Possibility to collect and process quantitative data on electronic publications
  - Usage
  - Citations

} become open access as well !
  
- Possibility to construct new indicators to measure different aspects of research impact
  
- Possibility to enhance and complement existing metrics

# Citations and the Journal Impact Factor

## Journal Impact Factor: mean 2-year citation rate

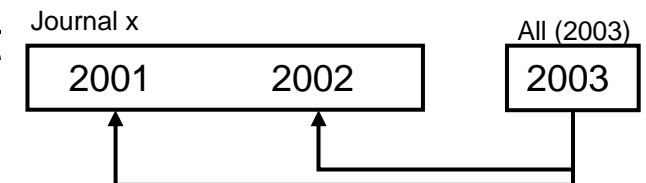
2003 citations to 2001 and 2002 articles in X

Divided by

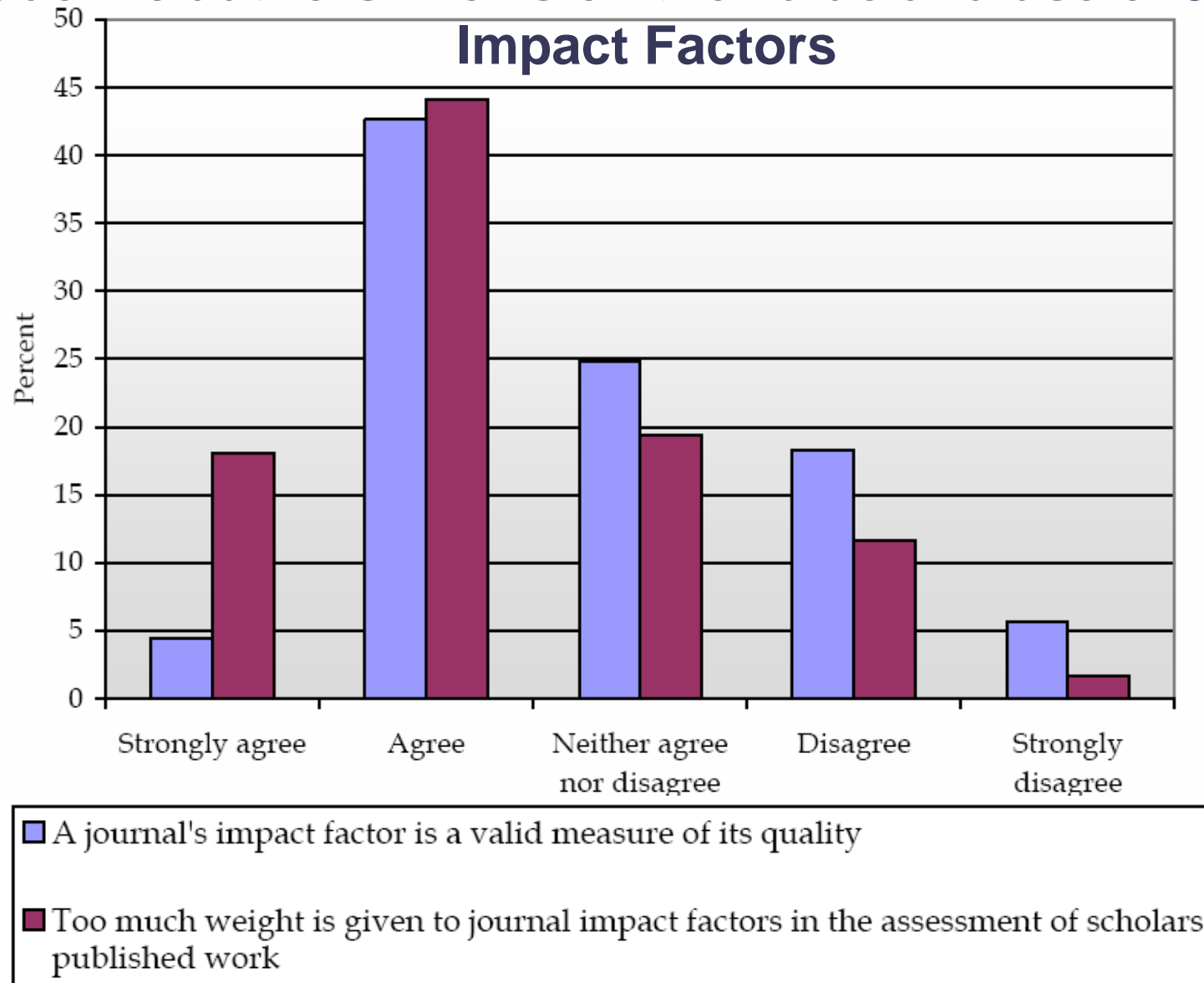
number of articles published in X in 2001 and 2002

## Widely applied in research evaluation

- Fair approximation of journal “status”,...but
- Used to rank authors, departments, institutions, regions, nations, etc.
- Now common in tenure, promotion and other evaluation procedures!



## Academic authors' views on the value and use of Journal Impact Factors

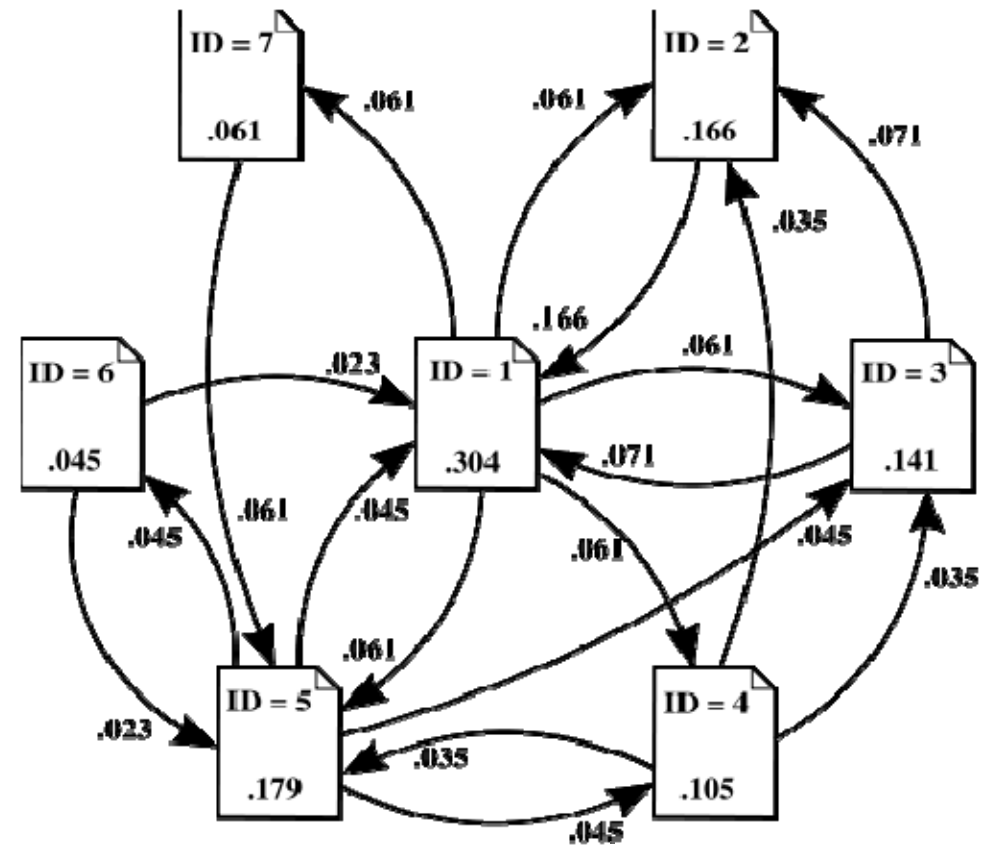


# Page Rank

## Reciprocal voting of nodes in a network

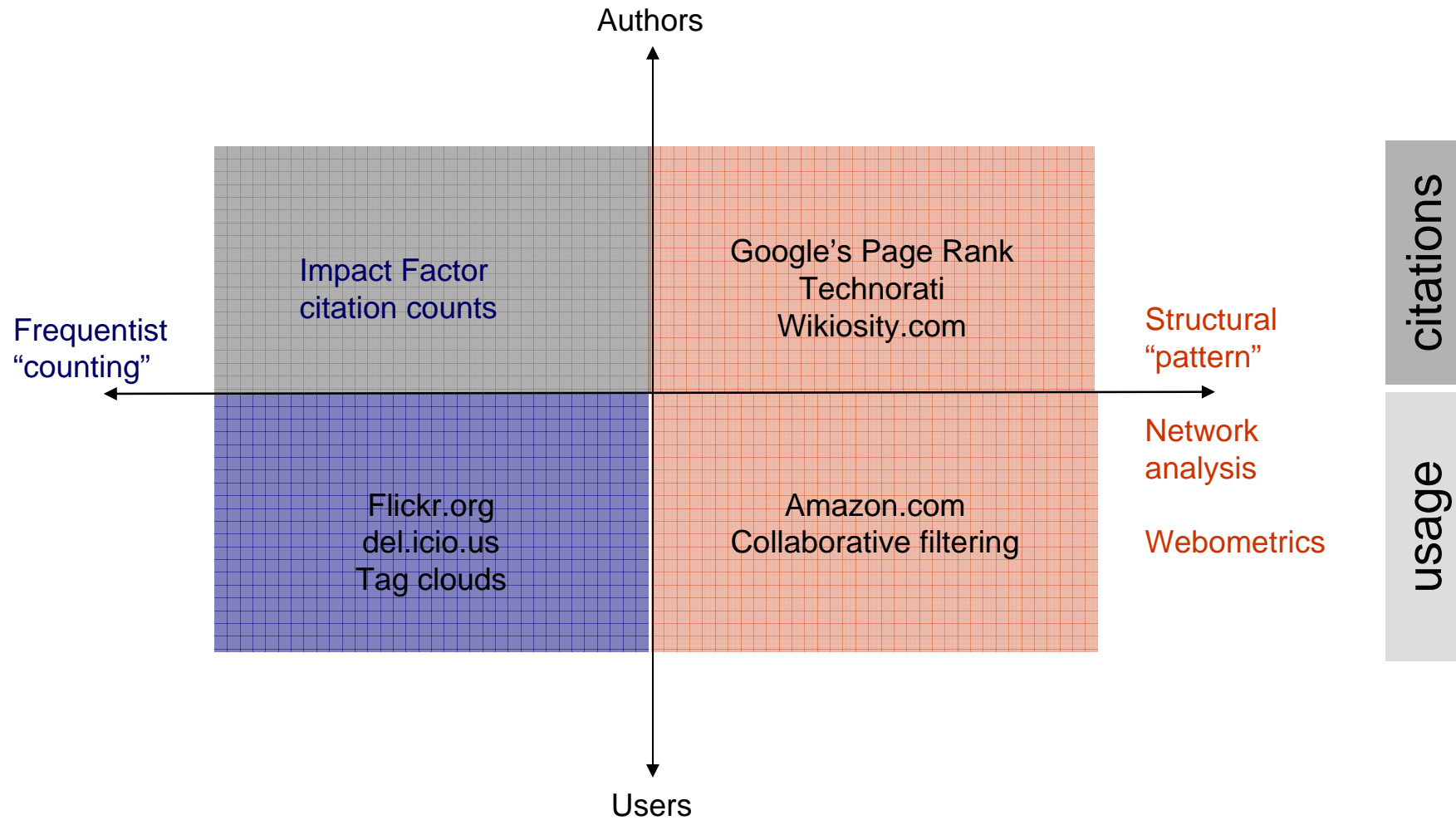
Can be applied to any collection of entities with reciprocal references

Related approaches in network analysis include authority and hub values (HITS algorithm)



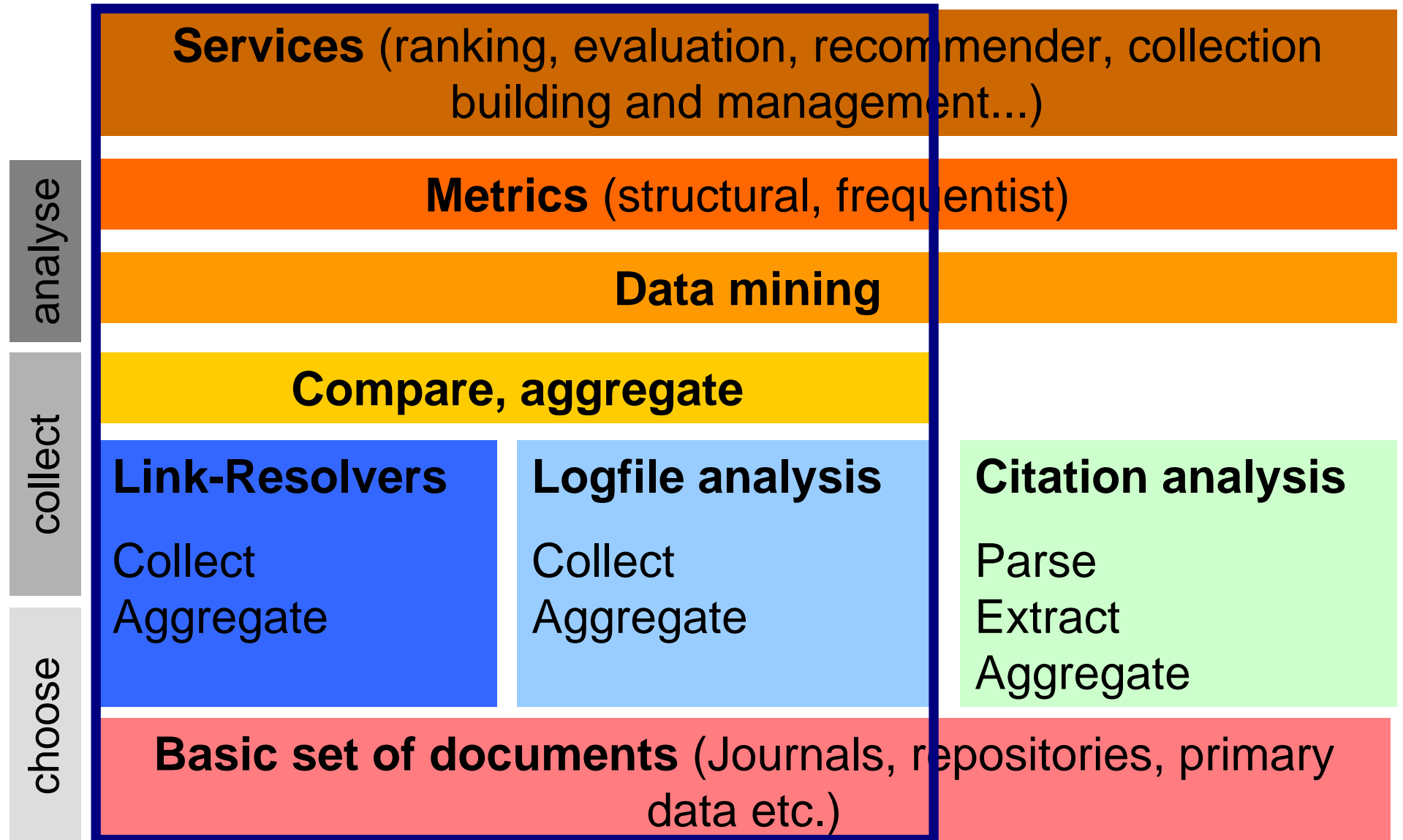
$$PR_i = \frac{1-d}{N} + d \sum_{j \in \{(j,i)\}} \frac{PR_j}{C_j}$$

# A Taxonomy of Metrics



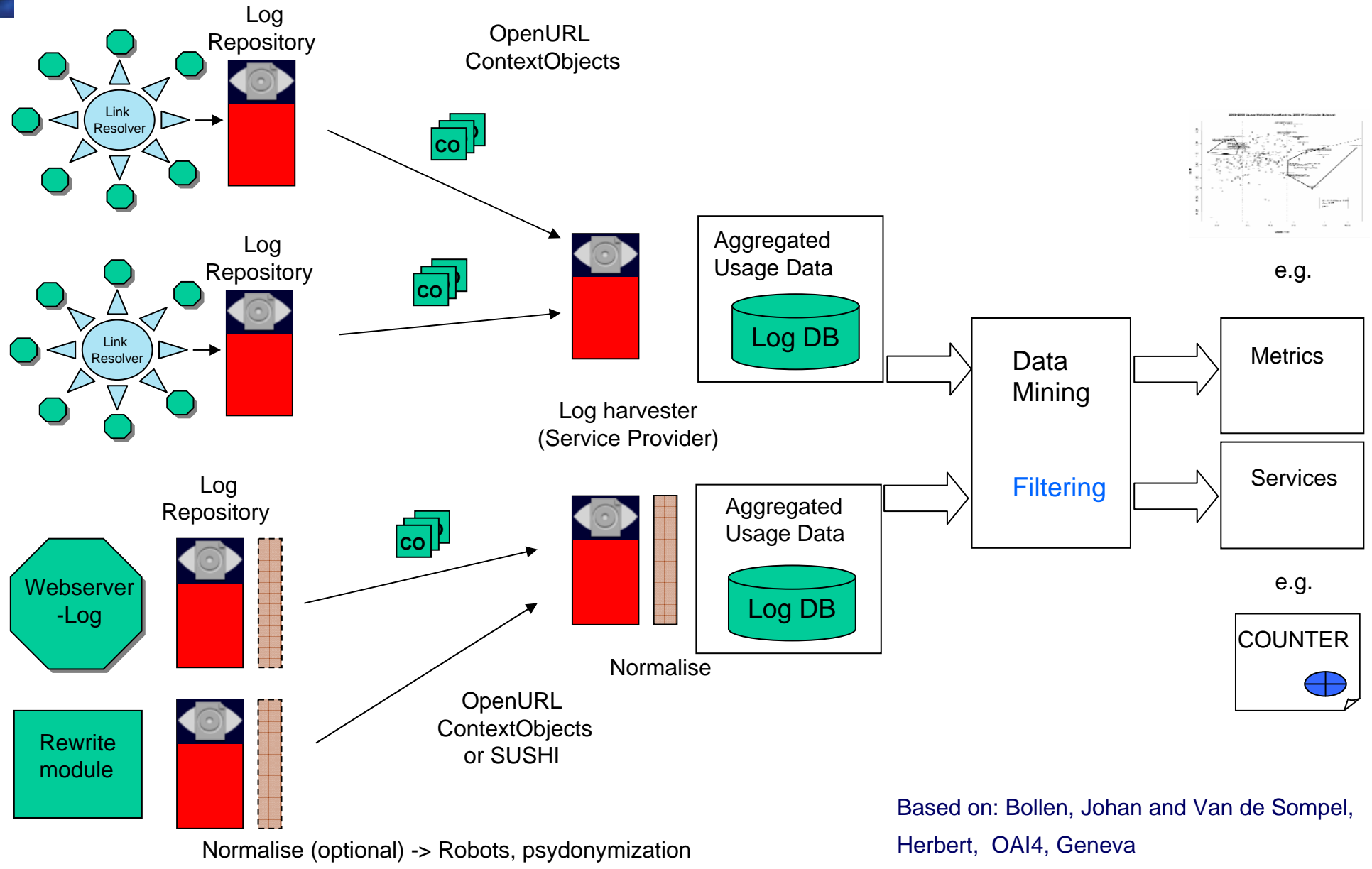
Based on: Bollen, Johan and Van de Sompel, Herbert (2005) A framework for assessing the impact of units of scholarly communication based on OAI-PMH harvesting of usage information. *OAI4*, Geneva

# Measuring Publication Impact: The Elements (schematic)



# Infrastructure for Collecting Usage Data

www.uni-stuttgart.de



Based on: Bollen, Johan and Van de Sompel, Herbert, OAI4, Geneva



## Ongoing Work

### ➤ LANL

- bX (with CalState, ExLibris)
- MESUR
- ...

### ➤ UK

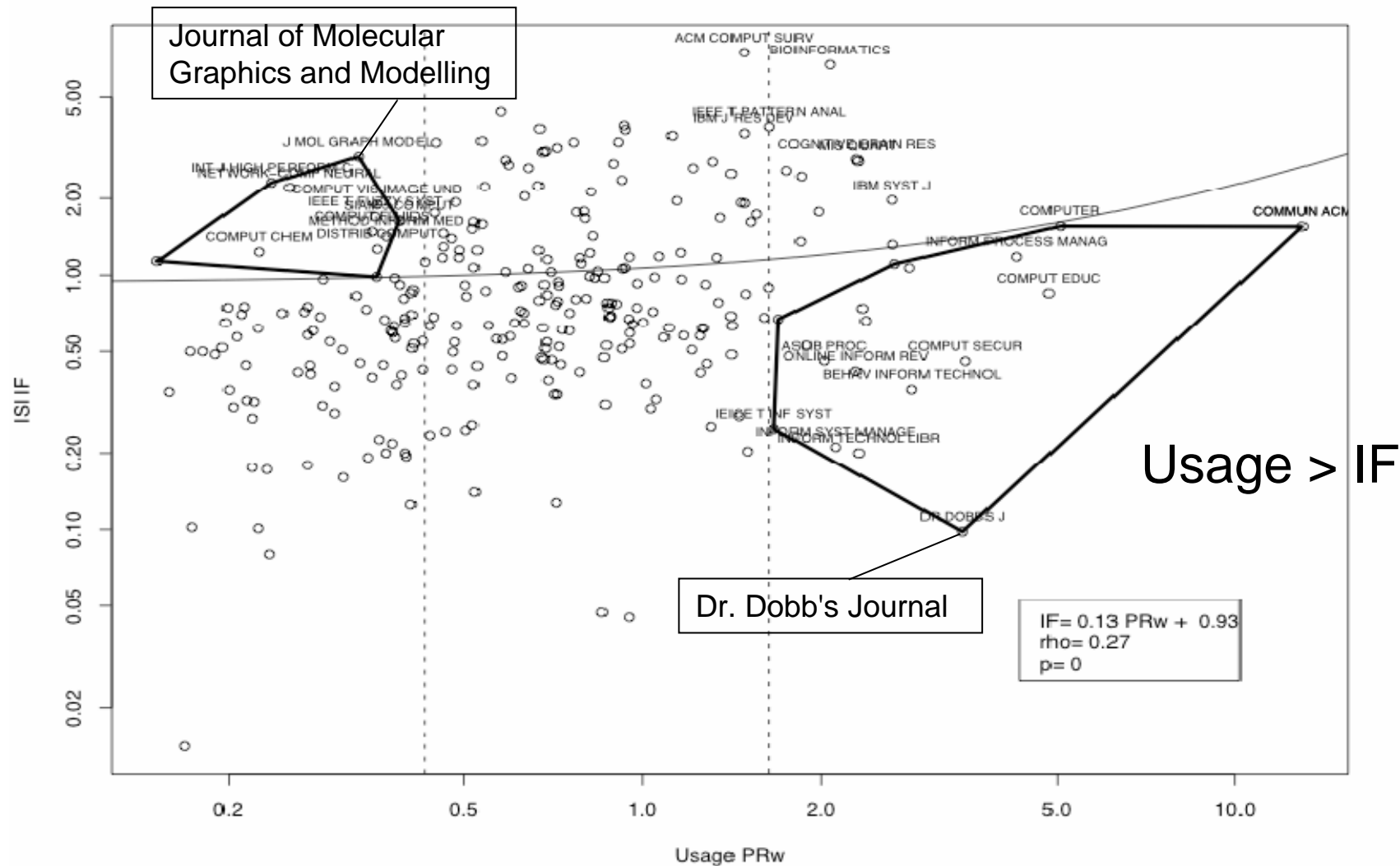
- University of Southampton (Citebase, IRS, EPStats ...)
- University College London
- ...

### ➤ Germany (DINI / DFG)

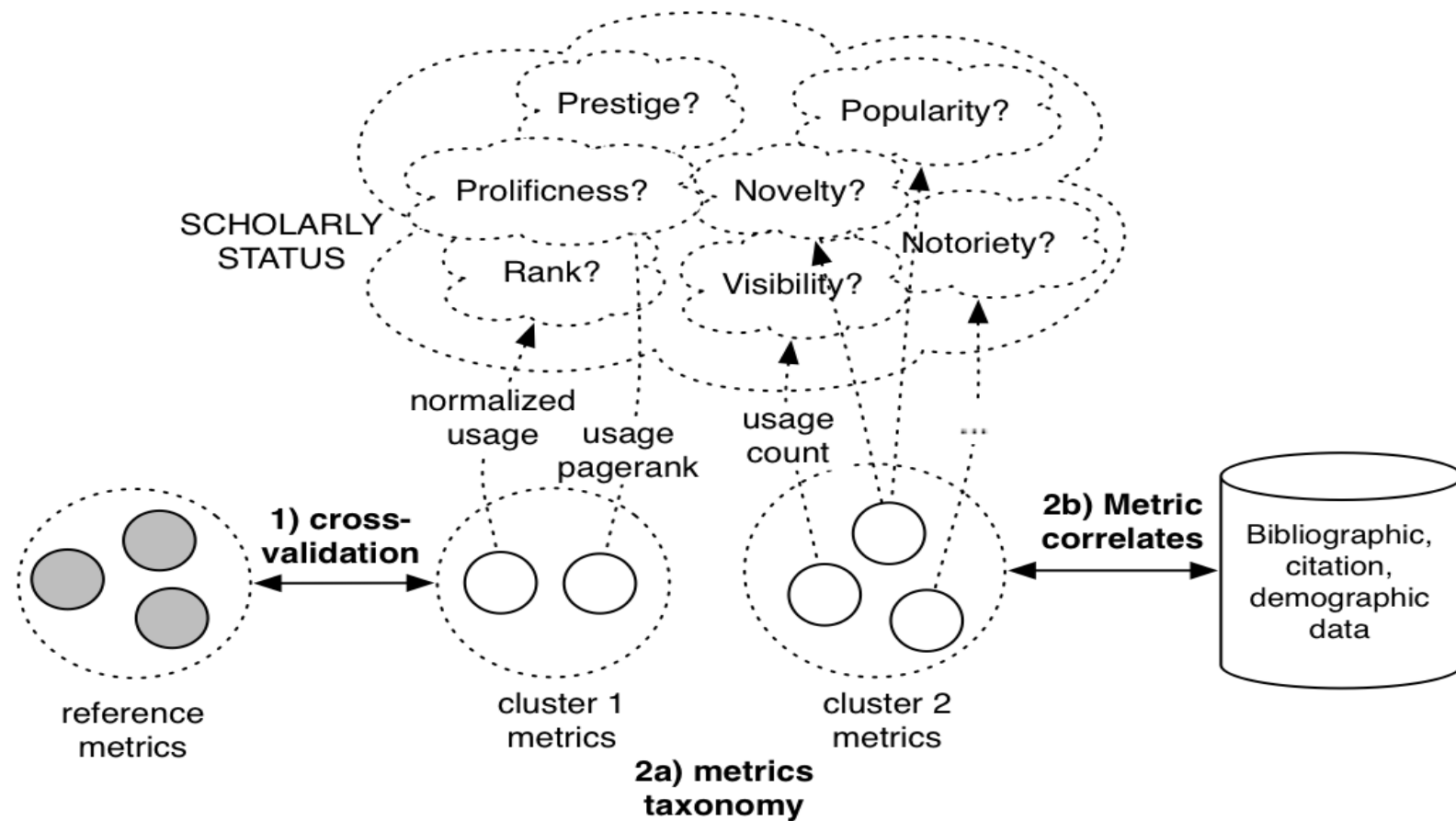
- Göttingen State and University Library
- Stuttgart University Library
- Computer and Media Service Humboldt University Berlin
- Saarbrücken State and University Library

# Examples: bX - Comparison of Journal Usage PageRank and Journal Impact Factor

2003–2005 Usage Weighted PageRank vs. 2003 IF (Computer Science)



# Examples: MESUR – Aspects of Impact





## Examples: DINI - Infrastructure

- Cluster of proposals to the DFG
  - Network of certified open access repositories 2y ✓
    - National input to EU repository infrastructure project DRIVER
  - Usage statistics demonstrator ✓
  - Distributed open access reference citation service demonstrator ✓
  
- Co-operation with German collecting society for copyright charges (VG Wort)
  - Statistics based payout to authors (METIS)



## Conclusion

- Scholarly evaluation will evolve as scholarly communication does
- Infrastructure for collecting and aggregating usage data conceptually available, has to be deployed and implemented in practice on a large scale (DINI/DFG)
- Investigating metrics for different needs and purposes (MESUR)