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Quality Criteria for Controlled Web Vocabularies

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Motivation

- **Create new** and **find existing** vocabularies to adopt or align to
- Must fit to the needs of the developer/adopter
- Efficient automated method needed to support developers in
  - creating vocabularies to reach intended goals
  - Finding suitable vocabularies
- Focus on SKOS vocabularies in a Web of Data setting

Approach

Standards, best practices and metrics for vocabulary development exist

- ISO/DIS 25964-1
- ANSI/NISO Z39.19-2005
- Soergel, Kless2010, Stvilia2007,...

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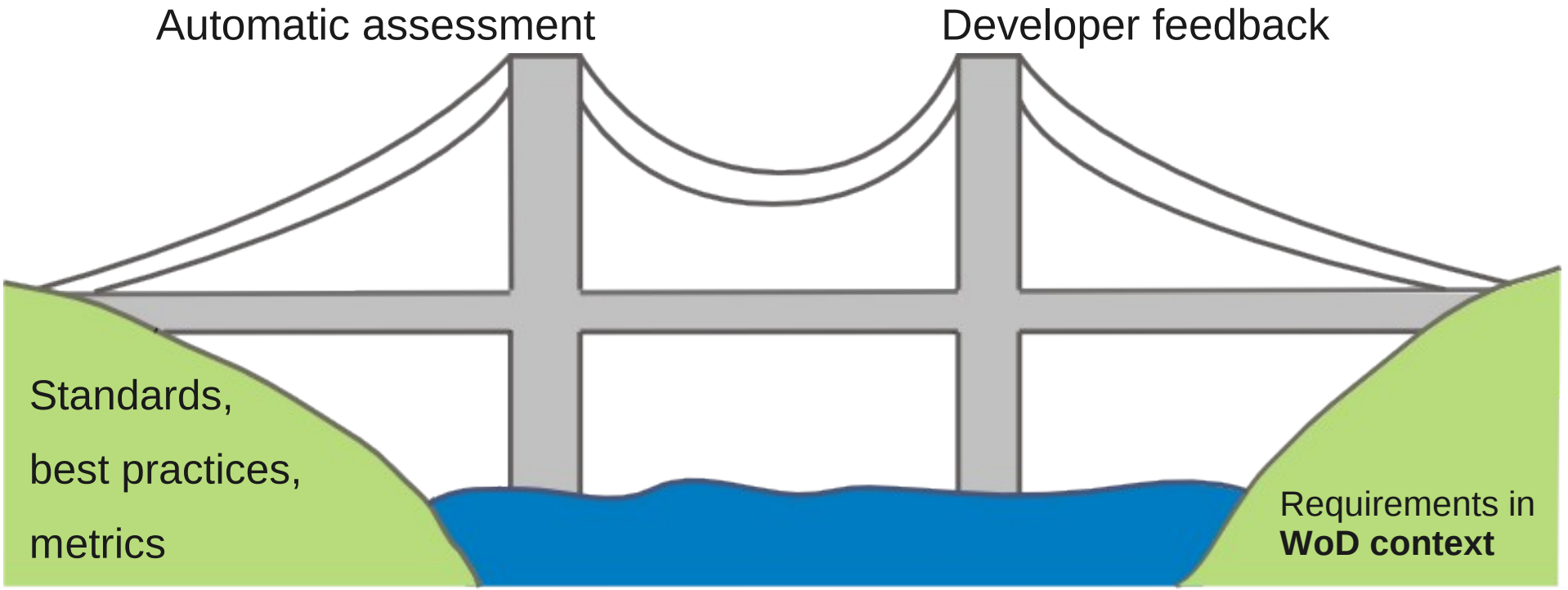
Requirements in **WoD context**

- Application-driven, e.g.,
  - Search & retrieval
  - Query expansion
- Maintained
- “Well-known”
- Documented
- Multilingual
- ...

Quality Criteria

- No absolute measure for vocabulary quality
- Each criterion covering specific requirement

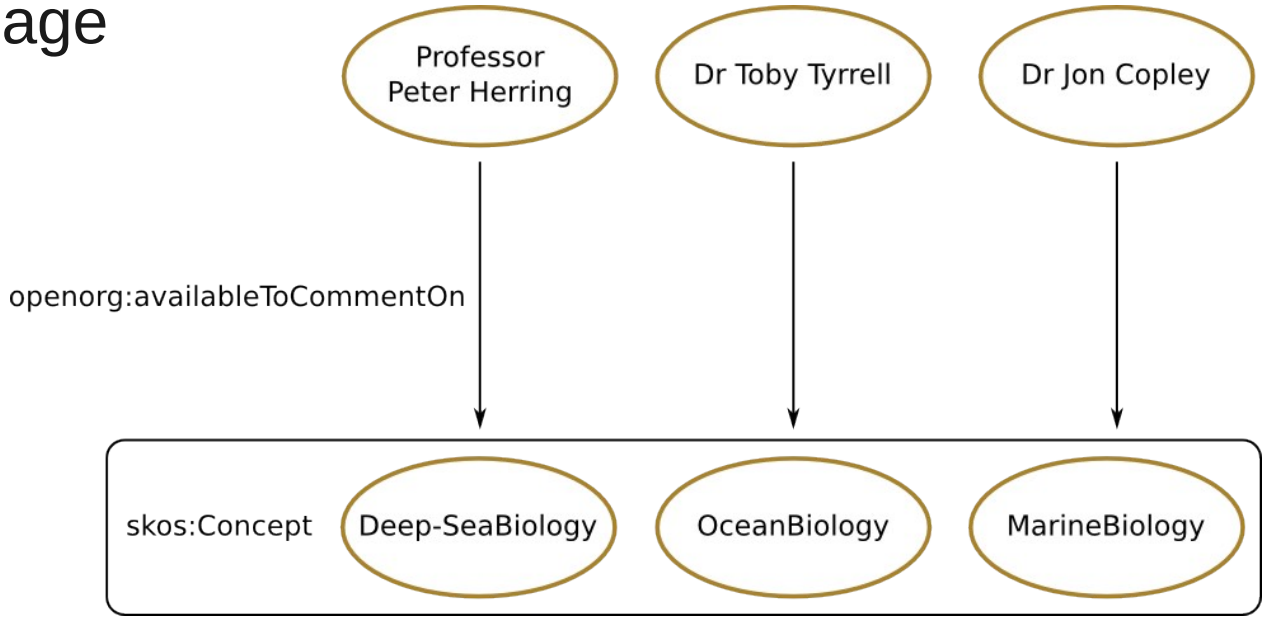


Methodology

- Identified criteria to support real-world use cases
- Reviewed occurrence in existing vocabularies
  - Press contacts information dataset (PCI), University of Southampton
  - STW Thesaurus for Economics, Leibniz Information Centre for Economics
  - New York Times People Vocabulary (NYTP)
  - LVAk Thesaurus, Austrian Armed Forces

Criterion – Loose Concepts

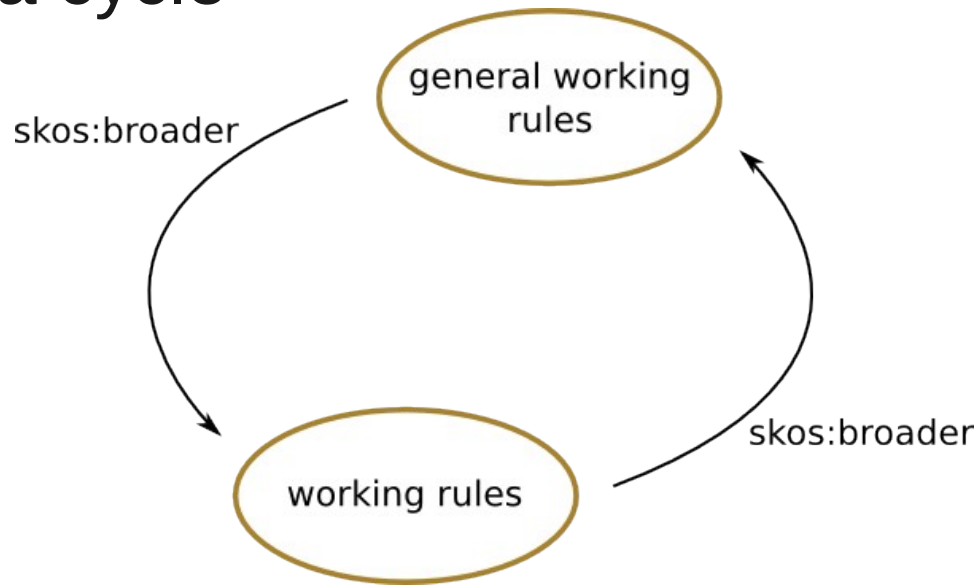
- Relative number of loose concepts
  - PCI
    - All concepts (1125) are loose concepts
    - Only for some concepts wikipedia references are defined, using foaf:page



Criterion – Cyclic Relations

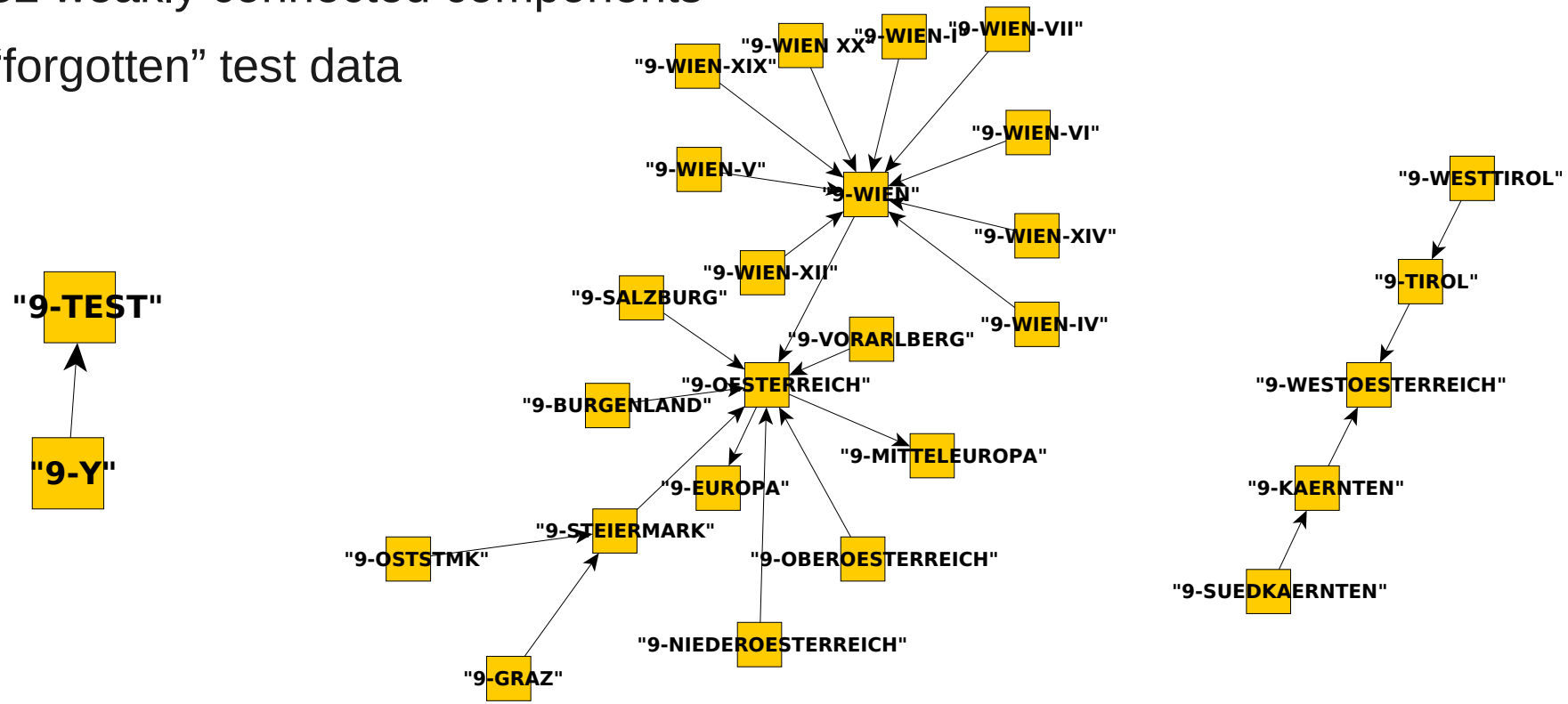
- LVAk
  - >13400 concepts
  - 6 cycles invoking hierarchical relations
  - 2-5 concepts involved in a cycle
  - Creator's feedback:

    “Relations need revision”



Criterion – Weakly Connected Components

- LVAk
  - 1 giant component (>13000 concepts)
  - 32 weakly connected components
  - “forgotten” test data



Criterion - Ambiguous labeling

- STW
  - Duplicates (7 concept pairs labeled identical)
  - Manifestation:

ZBW Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Criterion - Multilinguality

- Increases potential vocabulary user base
  - PCI
    - none of the plain text literals have a language tag
  - STW
    - 3 languages available “en”, “de”, “x-other”
    - Majority of concepts (99%) labeled in 2 languages, rest (only 68) in 3 languages

Criterion – Linked Data Issues

- Degree of external links
  - PCI: 9 of 1125 concepts have foaf:page to wikipedia
  - STW and LVAk: none defined
  - NYTP: avg. 2.9 external links per concept
- Link Target Availability
  - PCI: 7 of 1669 total links not dereferenceable (99.6% dereferenceable)
  - NYTP: 90% dereferenceable
  - Indicator for vocabulary maintenance

Conclusions

- Found criteria have practical relevance
- Further criteria, documentation, in-depth coverage
  - qSKOS project

    https://github.com/cmader/qSKOS/wiki/Quality-Criteria-for-SKOS-Vocabularies
  - Work in progress
- Thank You!
  - christian.mader@univie.ac.at
  - Questions welcome!