Librarians in a Wide Open World

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Librarians in a Wide Open World

- **AIM**
  - To analyze trends in emerging new librarians' professional roles in domain of digital librarianship, eScience, open science, eScholarship …
    - related with paradigm shift in science and
    - influenced by disruptive technologies in domain of knowledge production and consumption.

- **METHODS**
  - Literature review
  - Parts of findings from historical overview of librarians' professional identity uprising
  - Data visualization based on the content analysis of scientific papers published in D-Lib Magazine from 2010 to 2015

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- **SITUATION ON THE FIELD**
  - **Emerging librarians' roles**
    - Digital curators
    - Digital librarians
    - Embedded librarians
    - Data librarians
    - Data curators
    - E-science librarians
    - Digital humanities librarians
    - …

- Who staffs digital libraries
- What competencies and skill digital librarians have to possess
- Competence's gap
- Convergence of information metacommunity or with computer scientists
- Re-conceptualization of library profession or invention of new professionals

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- **Why it happens:**
  - Interdisciplinarity of eScience
  - Digital libraries are integral part of cyberinfrastructure (Hey), infosphere (Floridi) or IoT of HD-Interaction (Mortier et al.)
  - Traditional librarians' knowledge and skills are recognized by digital-intensive labor market

- **How it happens:**
  - Mostly „accidental" digital librarians
  - Lack of generalization and common policies
  - Hard to identify the areas of new library profiles overlaps, imprecise terminology, lack of formal educational qualification
  - Self-educated professionals and workplace learning
  - Case studies show ad-hoc and particular-library solutions
  - Different levels of investments in national cyberinfrastrucutres
  - Hard to avoid once more a Dewey's LIS curriculum design:
    - "Character, expertise, institution" (Wiegand, 2000)

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- **HISTORICAL OVERVIEW**

  - **Environmental ecological system:**
    - Library as traditional professional environment for librarians

    - Librarians embedded in interdisciplinary research teams or partnering in virtual institutions
    - Outreach programs
    - Personalization of library services
    - Diminish library and collection management skills

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- **HISTORICAL OVERVIEW**

  - **Epistemological turn: intermediation and apomediation**
    - Diminished traditional role of librarians as intermediaries between knowledge production and consumption
    - Concerns about disintermediation and end of libraries
    - Library self-service programs

    - Prosumption (Toffler, 1980)
    - Apomediation (Kwanya et al., 2015)
    - In cyberinfrastructure librarians mediate between:
      - Users and users (in person or virtually) as part of research teams
      - Data (knowledge) and users
      - Data and computer agents (APIs, crawlers)
      - Different information systems (WebPACs, electronic databases, open repositories, social web, semantic web)
    - In cyberinfrastructure mediation is multifold and of much greater complexity

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- **HISTORICAL OVERVIEW**

  - **Constructionist approach: post-narrative discourse toward autopoietic systems**
    - Traditionally librarians deal with structured data (book and material fixed through print)
    - Library's aim was to enable post-narrative discourse of library collection
    - Librarians participate as intermediaries between collection and internal or individual construction of knowledge - **cognitive constructivism** (Talja et al.)
    - First digital libraries – information structured according to human-readable formats that support visual literacy in digital environment (digital library portals to digitized heritage, virtual exhibitions, electronic databases etc.)

    - Semantic enrichments (microdata, microformats, paradata, linked data formats RDF, OWL) open ways to machine-processable and re-usable data to be read, calculated, analyzed, and use by **machines**.
    - In context of cyberinfrastructure - cognitive methods fitted for machine reasoning - digital heuristics and hypotheses, contextualization of information objects, semantic abstracting, calculation, visualization …

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- **HISTORICAL OVERVIEW**
  - **Constructionist approach: post-narrative discourse toward *autopoietic* systems**
    - In postmodern science discourse is the vehicle through which the self and the world are articulated - **constructionist approach**
    - Principles of linked data - linguistic form of triplets (subject-verb-object), forming structure similar to any literal text, and in such way can be referred to as self-referencing, *autopoietic*, recursive, self-descriptive, meaningful …
    - **Autopoiesis** (Maturana & Varela, 1973)
    - widely used in sociology, communication theory, system theory, principia cybernetica.
    - Autopoietic library information systems are envisioned as digital platforms where data are reusable and form part of open linked data and semantic web, platform or application that will sustain semantic publishing, ontology engineering and other machine reasoning methods.

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- **RESEARCH**

  - **Aim:** to visualize results of content analysis of articles published in open journal D-Lib Magazine in last five year coverage (2010-2015)
  - To confirm findings of historical overview and to provide new discovery linkages among subjects and main interrelations within broad spectrum of research topics in domain of digital librarianship

  - **D-Lib Magazine**
    - open access journal with a focus on digital library research and development, new technologies, applications, and contextual social and economic issues.
    - its primary goal is timely and efficient information exchange for the digital library community to help digital libraries be a broad interdisciplinary field
  - **Content analysis**
    - The aim of co-word analysis is to achieve an in-depth understanding of research data as both the frequency of the topics and the connections between them.
    - results will show not only which keywords have been used most often, but also with which other keywords they have been connected to. The connections between our keywords were visualized in a network graph using multi-dimensional scaling (MDS) technique.

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- **RESEARCH**
  - **Methodology**
    - Extraction of texts from D-Lib Magazine's articles in coverage of last five years (2010-2015) using Import.io (https://import.io) with specially developed API
    - API succeeded to extract 231 articles or 2.302 pages of plain text, consisting of 1.029.719 words in 132.954 lines of text
    - For the objectivity of findings, only abstracts and keywords were selected for the purpose of co-word analysis
    - VOSviewer (http://www.vosviewer.com) has been used to run co-word analysis.
    - As a result of VOSviewer co-word analysis, network visualization of topics co-occurrence and the cluster density visualization was given.

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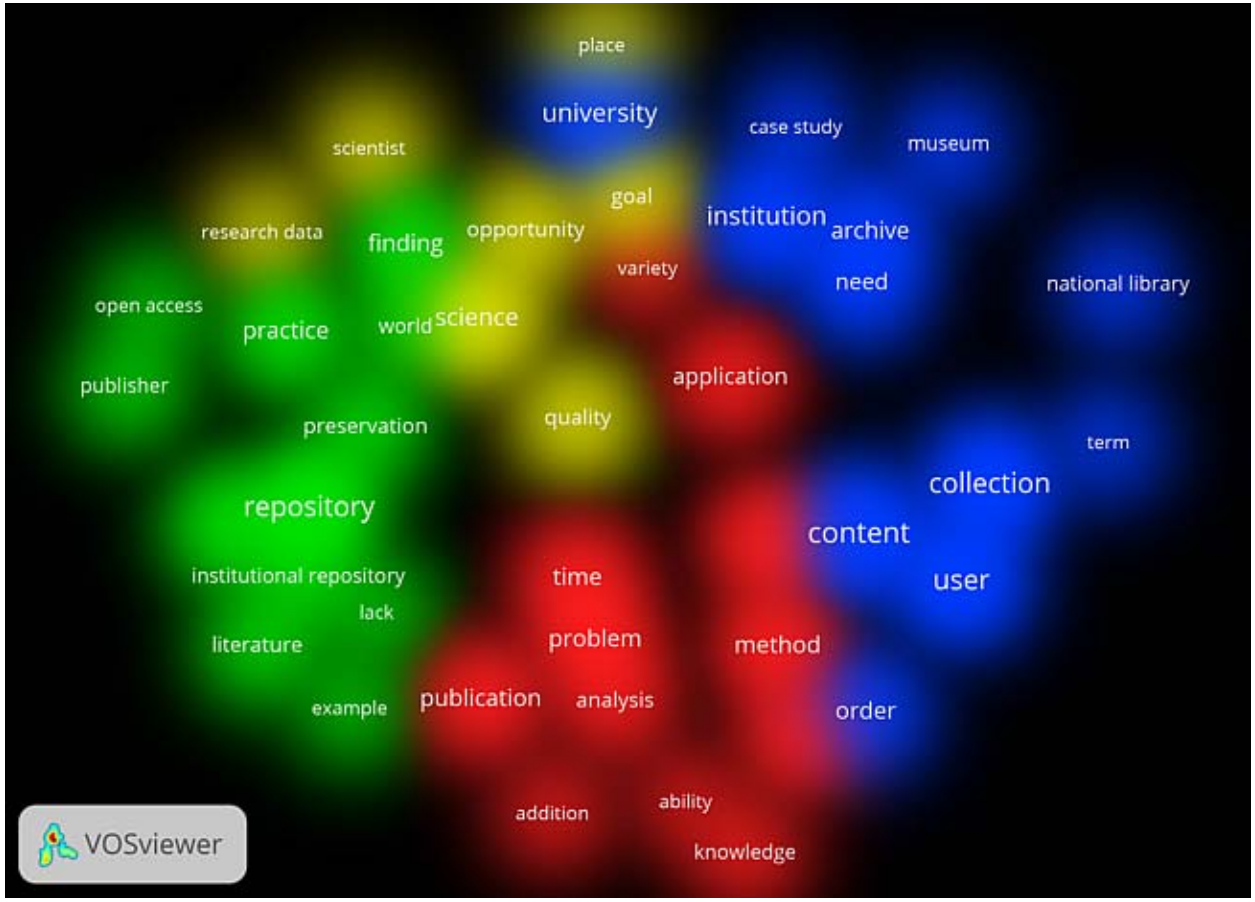
- **The cluster density visualization**



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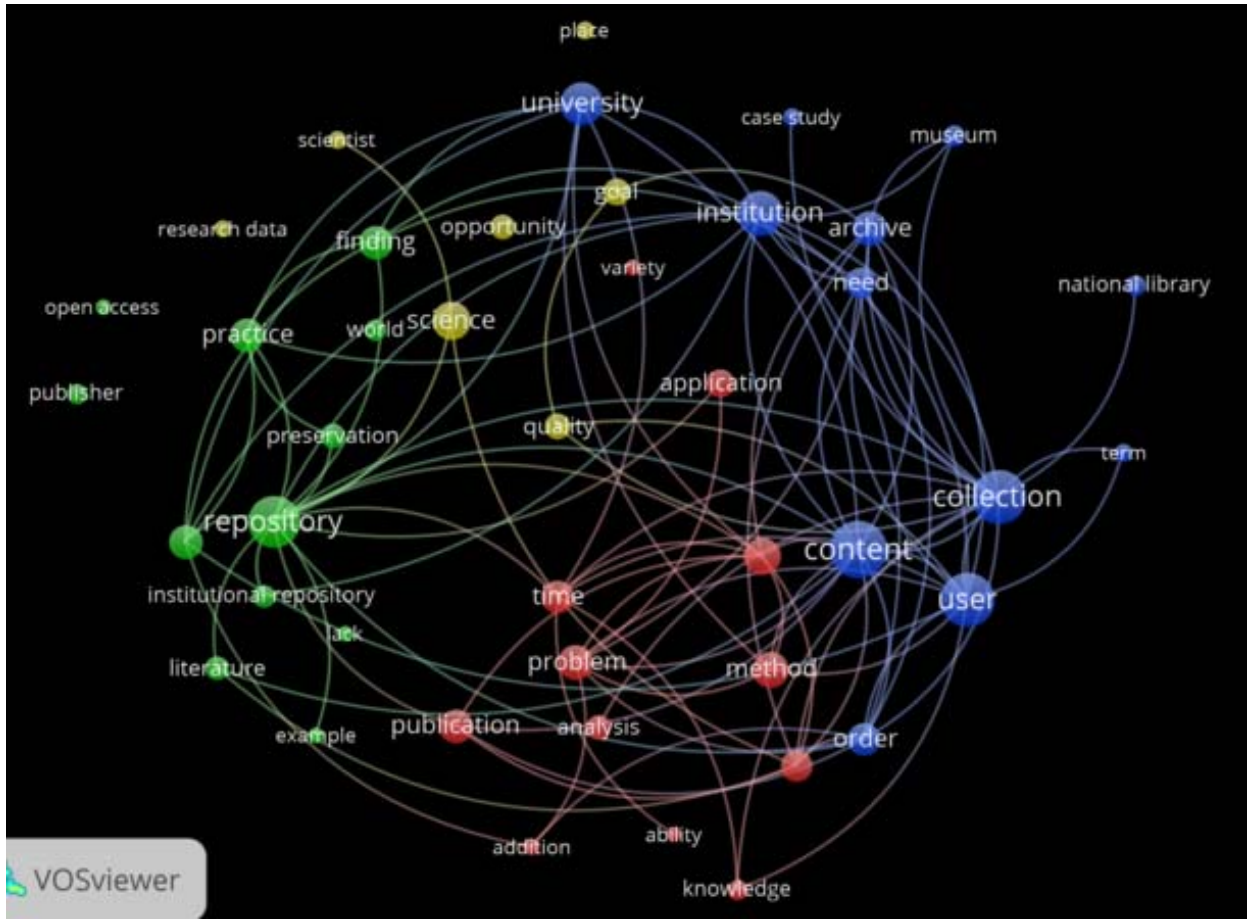
- **Network visualization**



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- **RESEARCH**
  - **Findings**
    - Traditional institutional contexts, such as libraries, museums, user and collections shift out of the focus, while topics such as applications, methods, analysis, and publication appear to be of higher interest.
    - In the middle (average score) are populated with topics that could be related to tools or context where the methods been used, which are now presented by publishers, repositories, literature, science, open access, scientists.

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- **CONCLUSION**

  - Changes in knowledge domain (reading habits, cognitive methods, creation of knowledge …) historically strongly influenced and directed developments of librarianship and library and information science
  - Traditional librarians' professional skills and competencies are recognized and valued by digital labor market, but certain intrinsic professional claims for upskilling in domain of knowledge production can be traced.
  - For the purpose of cyberinfrastructural society an interdisciplinary and systematic approach to LIS curriculum design and training could best fitted
  - Advocate opinion that changes related to emerging new professional roles of librarians in digital environment should be considered as one of revolutions in a long evolutionary path of conceptualization of librarians' professional identity.

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Thank you for your questions!

Looking forward to all your comments at dmachala@nsk.hr