

Scholarly Research and Publications Over Time: Identifying Trends for an Open Access Journal by Applying Data- Mining Methods

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The logo for the Munin Conference, featuring a stylized black bird silhouette above the text "Munin Conference on Scholarly Publishing".

**Munin
Conference**
on Scholarly Publishing



JeDEM.org: Journal Management & Editorship



Judith Schoßböck & Noella Edelmann
Journal of eDemocracy and Open Government
Scholarly-led & interdisciplinary community, platinum OA
Danube University Krems

Data Perspective



Gdansk University of Technology
Data mining & semantic analysis



Delft University of Technology
Open data, open science, open
government
Editor in Chief JeDEM

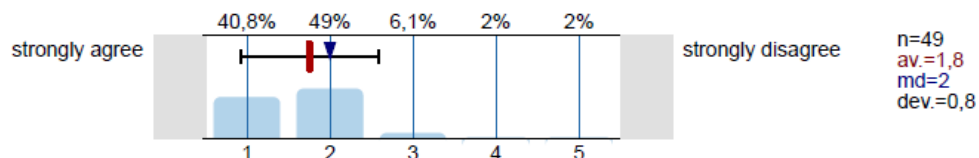
„Vital Statistics“ of JeDEM (Edgar & Willinsky, 2010)

Journal basics & editorial practices

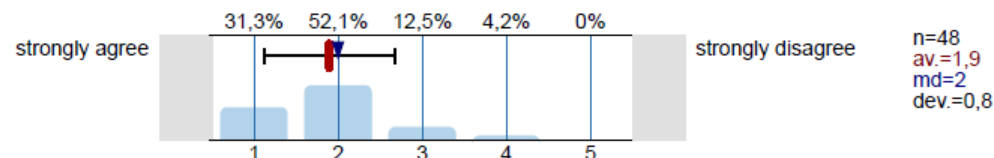
Journal sponsor	Academic department
Acceptance rate	50%
Research areas/diversity	E-democracy, e-society, e-participation, e-government, open data, data sharing & use, open science, open access, open source
Publication	Since 2009 (2x/year)
Indexing	Scopus, EBSCO, DOAJ, Google scholar, Public knowledge project (PKP) metadata harvester; DOIs

User Survey 2019, N=57 (Reasons for publishing with JeDEM)

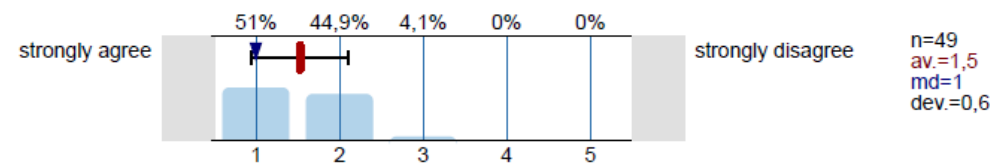
2.5) JeDEM publishes high quality articles



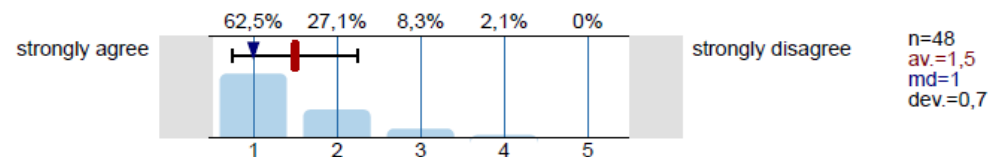
2.6) JeDEM has a good reputation in the field



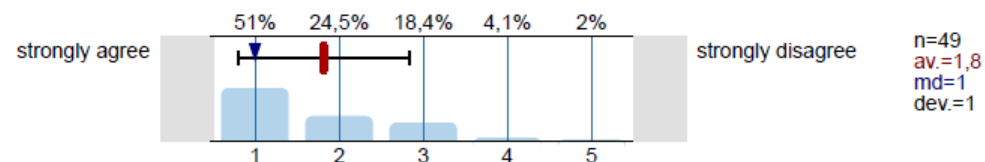
2.7) JeDEM is an e-journal



2.8) JeDEM is open access



2.11) JeDEM is indexed (Scopus, EBSCO, DOAJ, Google scholar and the Public Knowledge Project metadata harvester)



indexing & credits/including criticism

value-driven: OA

wide distribution (numbers)

good experience :)

support of a younger journal

turnaround time

affinity to research area

simple submission process

stable and recognized publisher_vs commercial journals

high academic standard/quality

Interdisciplinary Community (reasons for publishing with JeDEM)

Problem Statement

Strategic choices of journal editors & managers

- Enhance visibility, accessibility, impact
- Support of authors with publication choice

Useful information for **authors**

- Metrics and quantitative journal measures
- Research areas, themes and trends



EBSCO

Scopus®



DOAJ
DIRECTORY OF
OPEN ACCESS
JOURNALS

Objective

Approach for journal managers to identify **research trends**, **readers' preferences** & develop a **digital mindset**

Derive factors that impact trends, cooperations & journal development over time

WHERE?

- Countries & research **cooperations**

WHAT?

- **Topics** of papers over time



Methods

Data mining of journal content and metadata of all articles published since 2009

- text mining, topic modelling, k-means clustering, social network analysis, community detection

Qualitative Interpretation

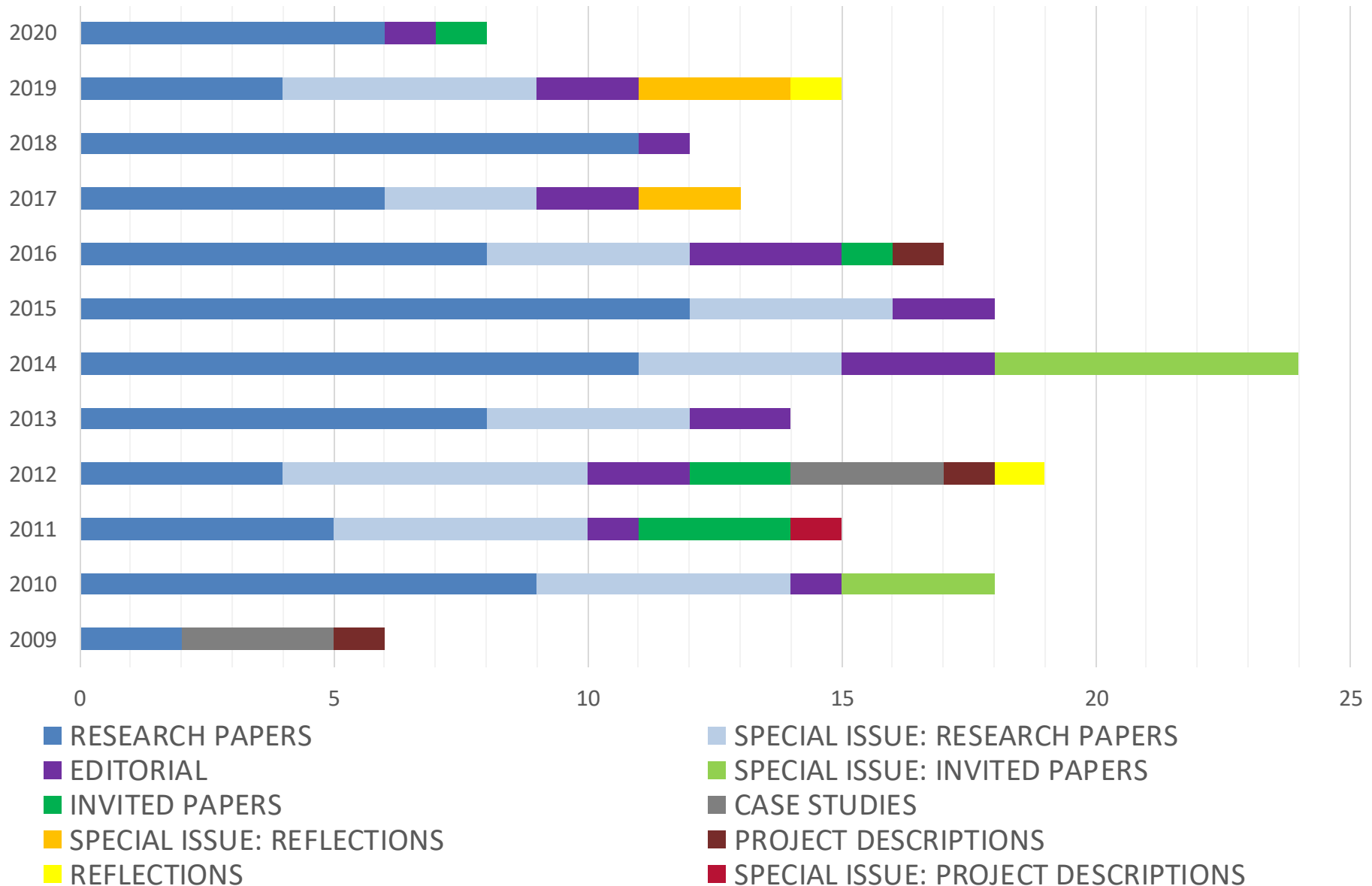
- internal journal management perspective
- relate trends to strategic decisions or publication details



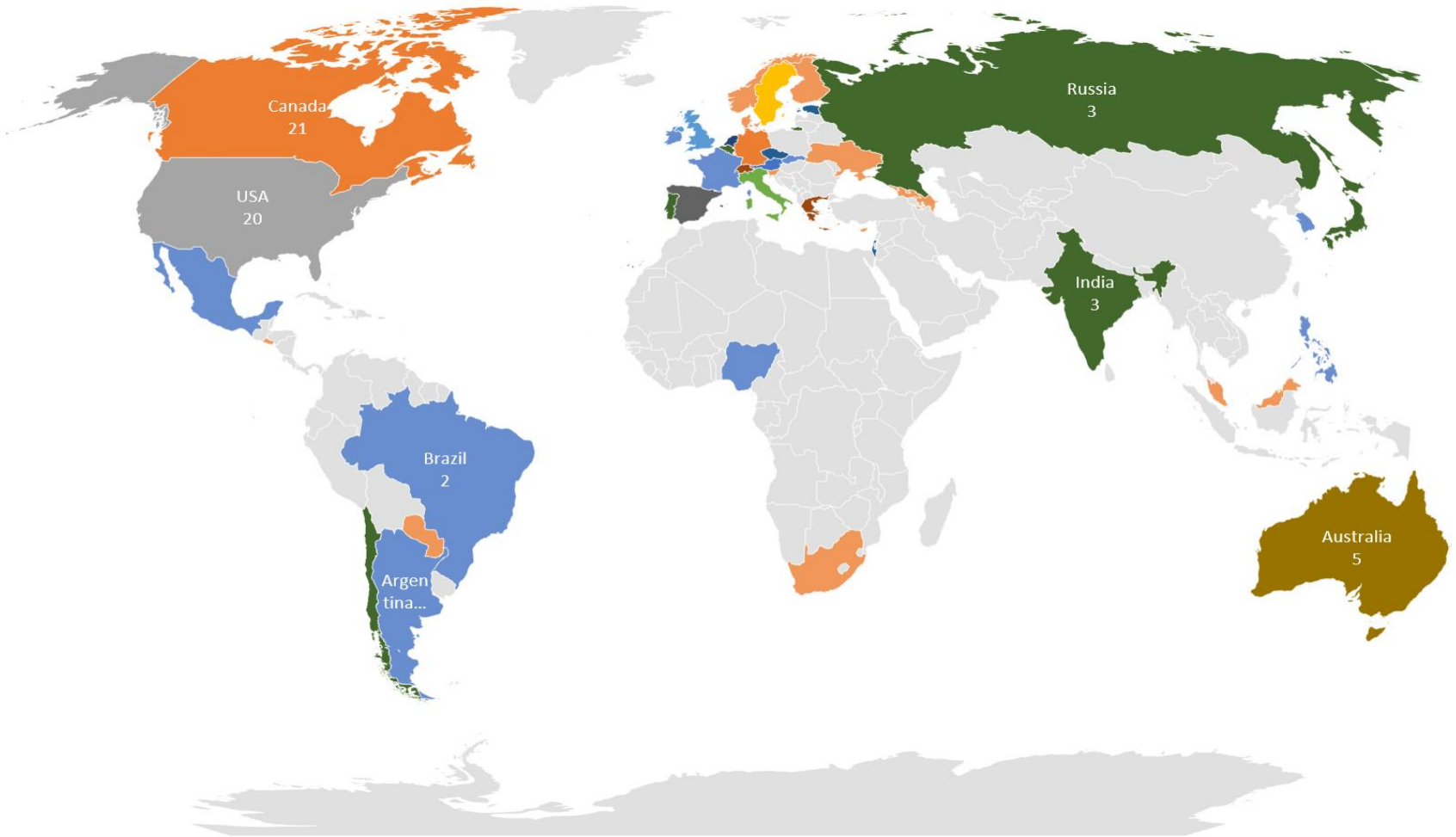
Results

1. Publication quantity and types
2. Leading countries
3. Visibility of research cooperations (through publications)
4. Research topics and evolution over time
5. Research topics per countries
6. Sub-topics of papers over time
7. Co-occurrence of words over time

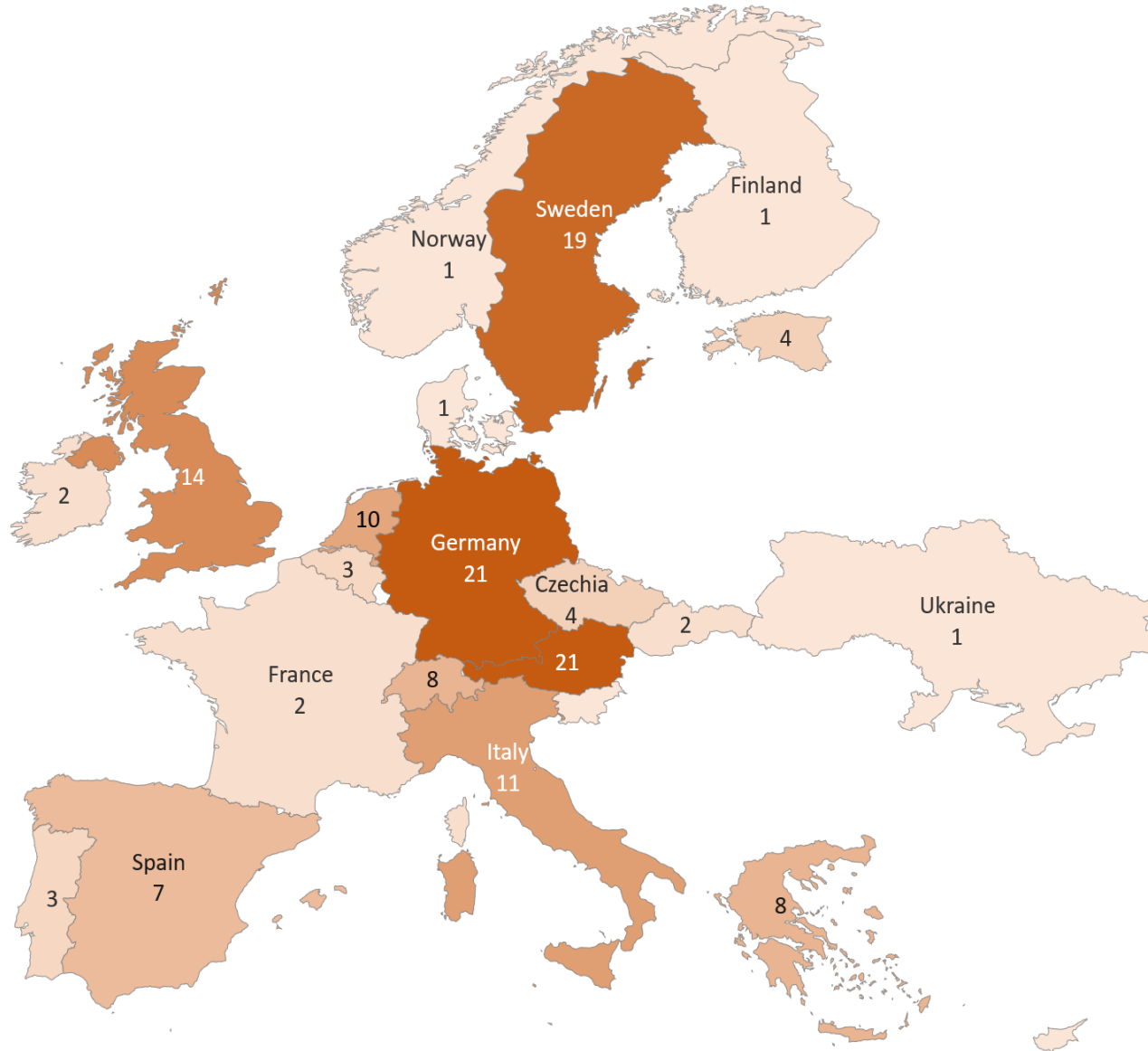
1. Publication Quantity and Types



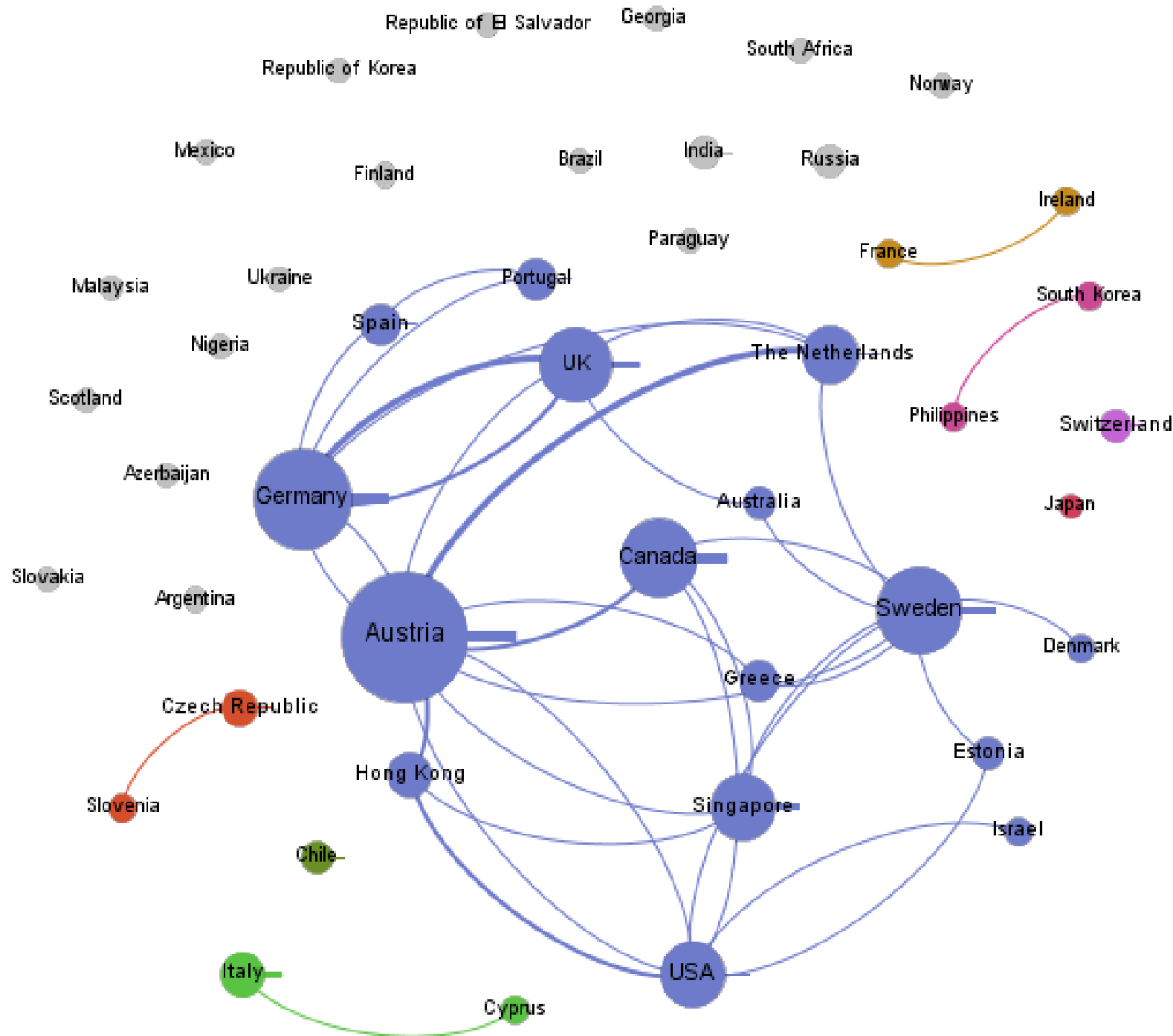
2.1. Countries



2.1. Countries (Europe)



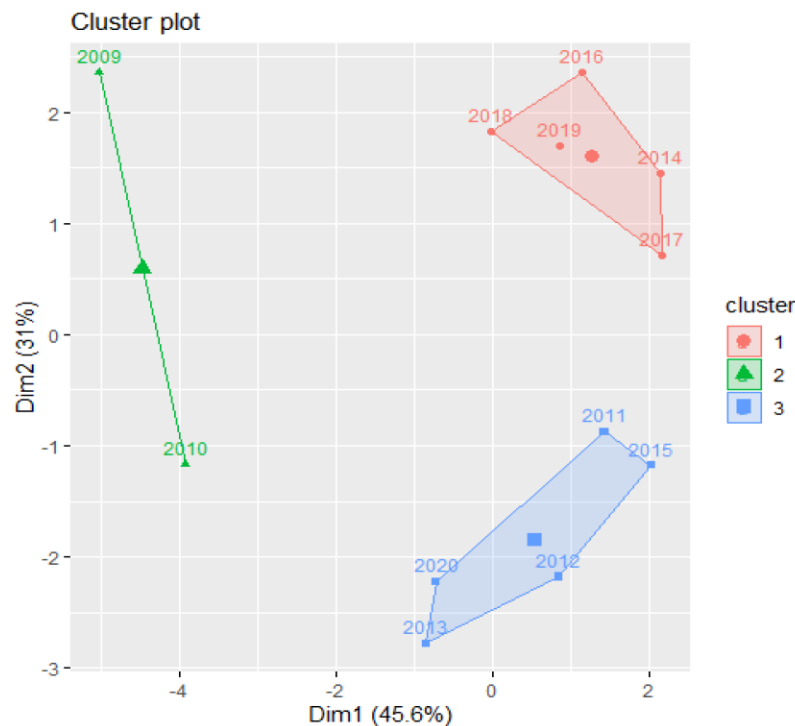
3. Visibility of Research Cooperations (Publications)



4. Research Topics (Methodological Steps)

- Preprocessing of article title & abstract
- Separation into epochs ordered over time
- Extracting the 10 most frequently used words and bigrams
- Relating the keywords (and bigrams) characterizing the main thematic context of each epoch with the parameters of adjacent eras in time
- Frequency matrix
- Cosine similarity
- K-means clustering

	Year 2009	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018	Year 2019	Year 2020
Year 2009	0	0.56232516	0.310045	0.34614	0.204236	0.306188	0.313987	0.258279	0.45255	0.3155	0.413712	0.225869
Year 2010	0.602085	0	0.539656	0.545656	0.520666	0.34695	0.427274	0.199954	0.408247	0.270816	0.379166	0.50298
Year 2011	0.310045	0.53965573	0	0.699634	0.605105	0.645836	0.671029	0.490134	0.680575	0.485207	0.665599	0.541223
Year 2012	0.34614	0.60208465	0.699634	0	0.762237	0.682406	0.773099	0.582527	0.712218	0.398588	0.486479	0.683402
Year 2013	0.204236	0.52066613	0.605105	0.762237	0	0.418335	0.734962	0.26735	0.539662	0.408811	0.351377	0.63808
Year 2014	0.306188	0.34695015	0.645836	0.682406	0.418335	0	0.737994	0.845706	0.844707	0.560451	0.700732	0.371553
Year 2015	0.313987	0.42727352	0.671029	0.773099	0.775995	0.737994	0	0.629009	0.678906	0.598614	0.580485	0.691481
Year 2016	0.258279	0.19995443	0.490134	0.582527	0.26735	0.845706	0.629009	0	0.755078	0.517873	0.612013	0.364283
Year 2017	0.45255	0.40824677	0.680575	0.712218	0.539662	0.844707	0.775995	0.755078	0	0.596741	0.721907	0.514956
Year 2018	0.3155	0.27081611	0.485207	0.398588	0.408811	0.560451	0.598614	0.517873	0.596741	0	0.607558	0.456255
Year 2019	0.413712	0.37916629	0.665599	0.486479	0.351377	0.700732	0.580485	0.612013	0.721907	0.607558	0	0.526914
Year 2020	0.225869	0.50298002	0.541223	0.683402	0.63808	0.371553	0.691481	0.364283	0.514956	0.456255	0.526914	0



4.1. Research Topics (Clusters)

3 clusters of thematic streams (bigrams)

(1) ELECTRONIC PETITIONS, E-PARTICIPATION INITIATIVE & CITIZEN PARTICIPATION

(2) OPEN DATA, SOCIAL MEDIA & SOCIAL NETWORKING, DISRUPTIVE TECHNOLOGIES & DIGITAL TRANSFORMATION

(3) OPEN DATA-DRIVEN GOVERNMENT, SMART CITY & CO-CREATION

Electronic Petitions
Electronic Participation
e-Participation Initiative
e-Petitions Systems
News Agencies
Parliaments and Governments
Public Institutions
State Art
Allow Citizens
Economic Development

Open Government
Social Networking
Political participation
Changing relation
Online participation
Open access
Relation between citizens
Public administration
Political authority
Climate Change

Public e-Service
Social Media
Legislative Transparency
Online Social
Parliamentary Openness
Social Networking
Citizen Empowerment
Civic Action
Collective Action
Democratic Reform

Open Data
Social Media
Data Initiative
New Media
Civil society
Enhanced Project
Project Management
Government Data
Open Government
Transformational eGovernment

Open Government
Open Data
Personal Data
Smart City
Informational Privacy
Five Star
Government Leads
Public Sector
Tokenized Ecosystem
Abolition of the Right

Open Government
Citizen Participation
Government Data
Civil Society
Data-driven e-Government
e-Participation Platform
Government Initiatives
Local Government
Open Data
Public Sector

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

2019

2020

Citizen Participation
Networking Sites
Policy Process
Public Service
e-Participation Initiatives
Voting Systems
Media Literacy
Online Deliberation
Recording Electronic
Public-service Broadcasters

Social Media
Open Data
Open Government
Media Platform
Public Sector
Social Networking
Open Link
E-democracy Adoption
Metadata Architecture
Parliamentary Informatics

Open Data
Open Government
Public Sector
Government Data
Smart City
Internet Voting
Social Networking
Online News
Collaborative Governance
Data Ecosystem

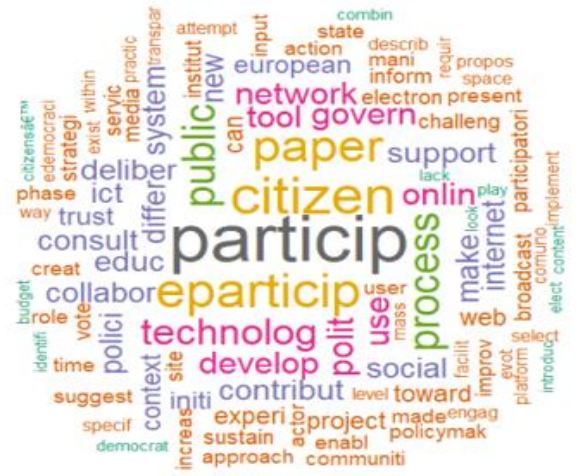
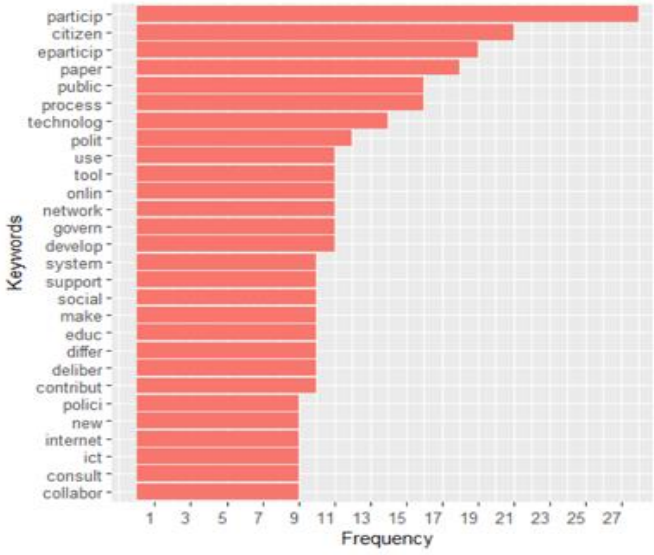
Open Data
Government Data
Open Government
Broadcast Channel
Open Link
Civic Technology
Data Policy
Gamified Participation
Real-time Data
Semantic API

Live Enrollment
Social Media
Co-creative Media
Open Government
Web Services
Civic Technology
Open Data
Data Initiatives
Democratic Engagement
Identity Documents

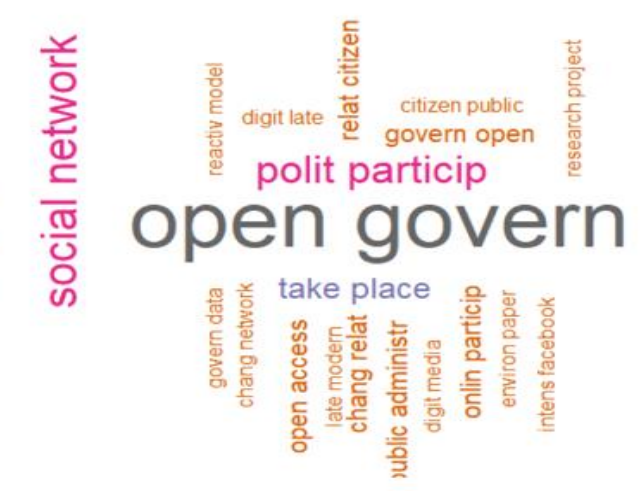
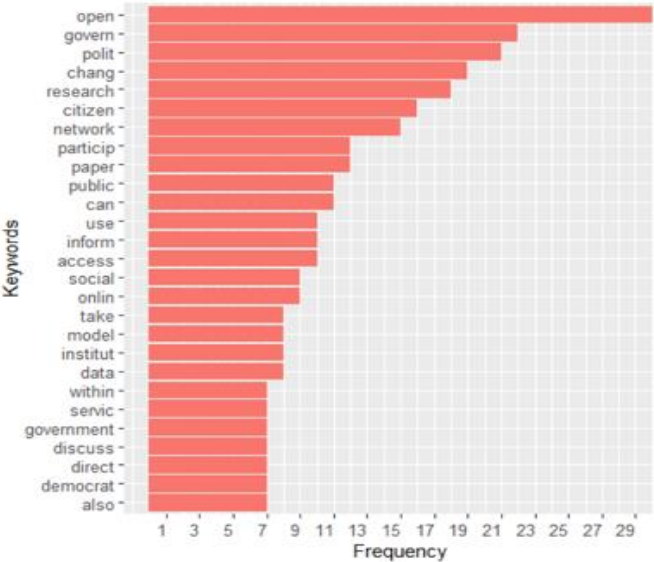
Social Media
Political Participation
Disruptive Technologies
Decision-making Algorithm
Artificial Intelligence
Big Data
Digital Transformation
AI in Government
Public Sector
Civil Citizens

4.2. Research Topics (Topical Trend)

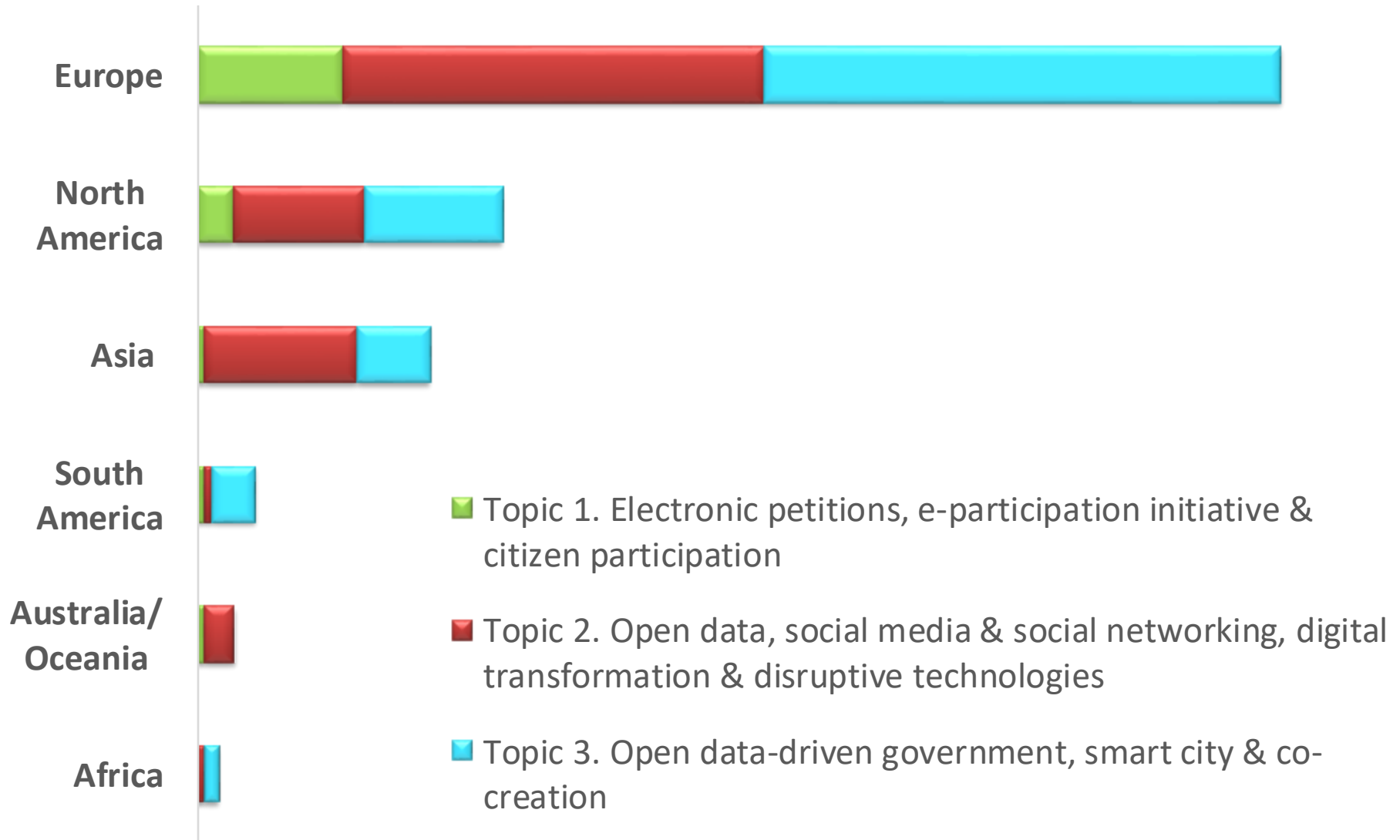
2010



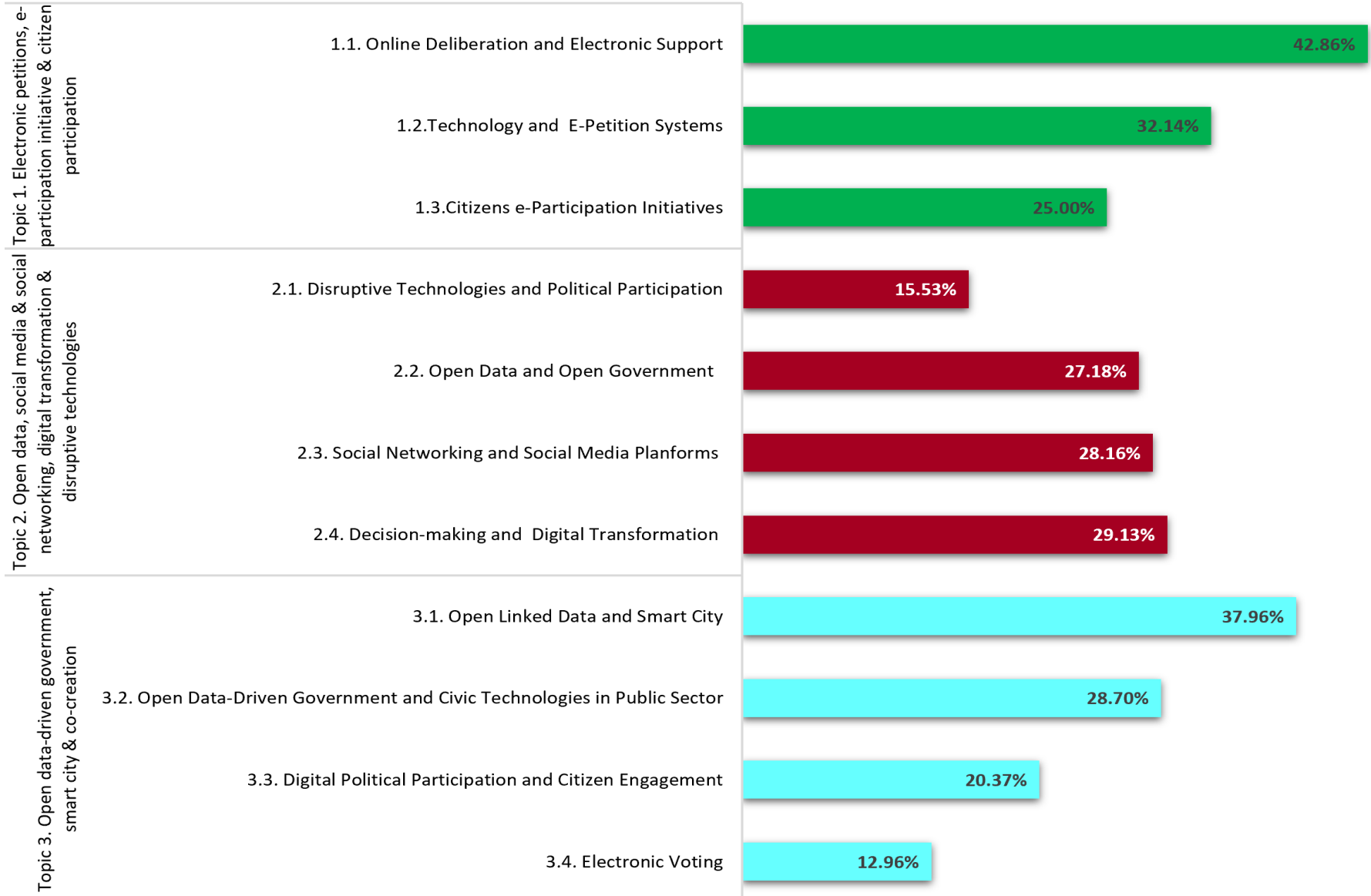
2011



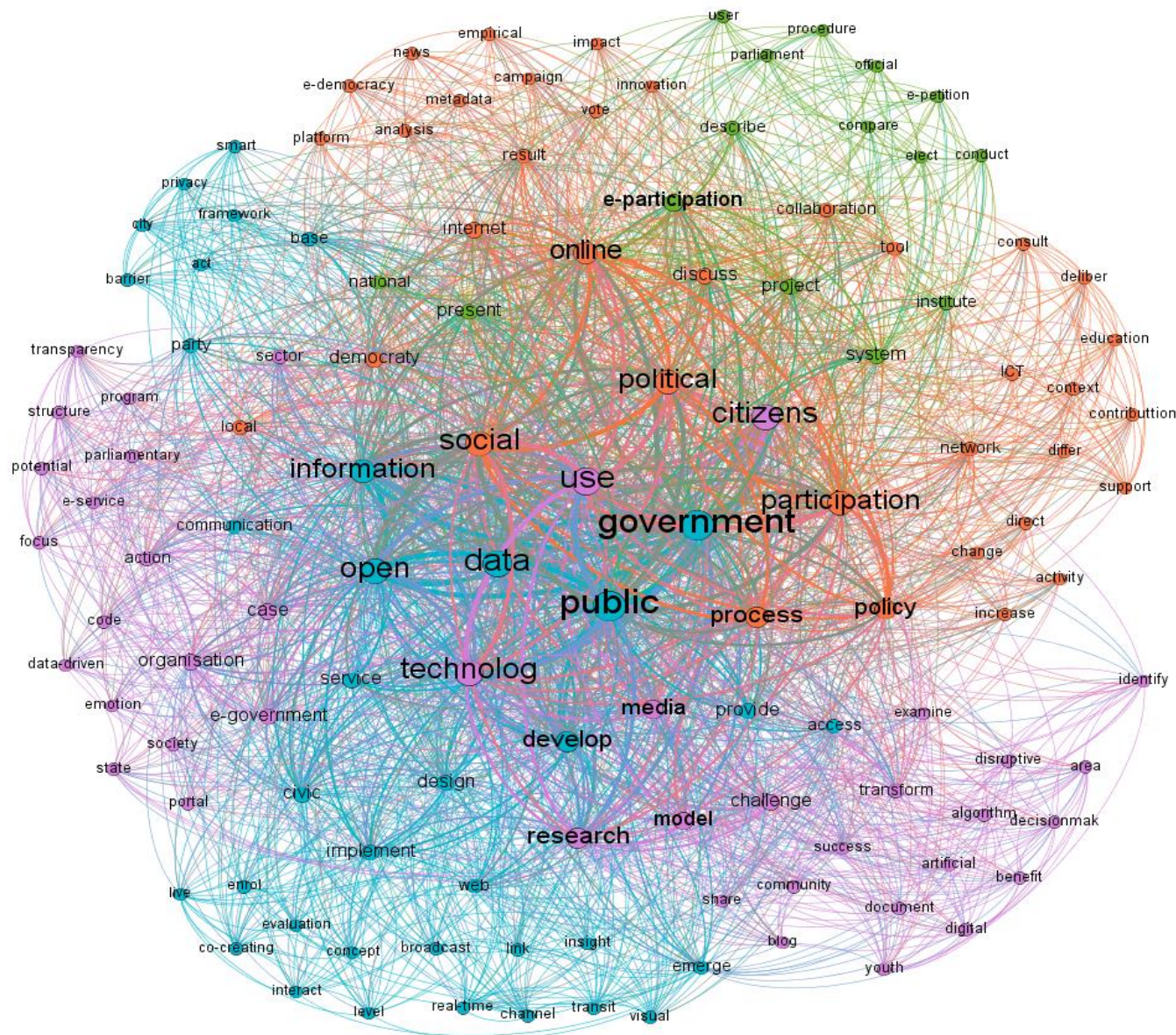
5.1. Research Topics per Continents



6. Sub-topics of Papers (Topic Modelling)



7. Word Co-occurrence Over Time



Work in Progress

- Research methodologies over time
- Primary data collection methods



Influential Factors of Journal Development

- **Guest editors** → topical and regional influence
- **Indexing systems** → quantity & quality of submissions
- **Research cooperations** → topical, regional, quantity influence
- **Naming/strategic name change** (“Open Government”) → reflecting research trends → topical influence
- **Predominance/missing of countries** → Hegemonial bias? (f.i. Africa & e-participation)
- **Other drivers** of topical & journal development?

Discussion

1. Tracing the evolutionary **stages of the study of scientific problems** & critical assessment of **scholarly developments**

- ✓ Are indexing systems trumping topical development?
- ✓ Who takes part in shaping research trends?
- ✓ Which countries are missing?



2. Insights regarding **journal development & strategy**

- ✓ Do our calls match what we get submitted? What difficulties are related to being interdisciplinary?
- ✓ Usefulness for other journal editors and audiences?



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The University for Continuing Education.

THANK YOU!

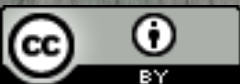
Case Comparison?

Similar analysis?

Contact:

www.jedem.org

judith.schossboeck@donau-uni.ac.at



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