



# Bibliometric Analysis of European Research on Digital Divide: An Exploration of the Corporate Landscape

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# 1. Motivation



- ▶ The ubiquitous use of digital technologies has transformed many aspects of society and the economy, bringing potential benefits and drawbacks.
- ▶ The Digital Europe program and the agenda to bridge the digital divide.
- ▶ The few studies using the bibliometric method focus mainly on health sciences, computer science, and technology.
- ▶ Data availability from three platforms containing references and citations from academic journals has stimulated this research initiative.

## 2. Objectives and Research Questions I



### Objectives

- ▶ Understand the intellectual structure within the domain of the digital divide.
- ▶ Examine European research components' intellectual interactions, structural connections, and thematic relationships.
- ▶ Explore the corporate digital divide among the collected corpus and identify trends and patterns within the literature.

## 2. Objectives and Research Questions II



### Research Questions

- ▶ What have been the main trends and shifts in the focus of European research on the digital divide over time?
- ▶ Which are the most prominent authors and publications in the field?
- ▶ How do the intellectual interactions, structural connections, and thematic relationships among European research components on the digital divide shape the current state of knowledge in this field?
- ▶ What are the key themes and subtopics related to the digital divide in European research, and how are they grouped or clustered in the literature?
- ▶ How is the corporate digital divide addressed in European research on the digital divide, and what areas have been largely unexplored in this field?

### 3. The Digital Divide Overview I



- ▶ The digital divide is also known as the digital gap, inequalities, or disparities.
- ▶ The interaction with other existing gaps such as income, education, gender, generational, and regional, among others (Ragnedda 2017).
- ▶ The evolution of the concept has pointed out the phenomenon's complexity and the effects on the different layers of society and the economy (Dijk and Hacker 2003; Ragnedda 2017; Shakina, Parshakov, and Alsufiev 2021).

### 3. The Digital Divide Overview II

- ▶ Waves of Research
  - ▶ **The first wave:** Physical access to technology -> possession of computers and access to the internet (Dijk and Hacker 2003).
  - ▶ **The second wave:** Usage of digital technologies and skills (Dijk 2006).
  - ▶ The divide is not exclusively a matter of access or possession of technology. It encloses the ability to effectively search, access, and evaluate information using digital technologies.



### 3. The Digital Divide Overview III



- ▶ Waves of Research
  - ▶ **The third wave:** expands upon the inequalities previously identified in the 1st and 2nd wave.
  - ▶ Focuses on the benefits previously gained from access, skills, and usage of digital technologies.
  - ▶ Emphasize on the ability to benefit from digital technologies in a data-driven market to improve personal and professional aspects (Ragnedda 2017).
  - ▶ van Deursen et al. (2015) highlight the disparities from the tangible outcomes gained from different forms of access and usage of digital technologies.

### 3. The digital divide overview VI



#### The corporate landscape

- ▶ Digital revolution -> different aspects of daily activities -> how we conduct business.
- ▶ The corporate digital divide is the disparity in digital capabilities and resources between businesses that can effectively use DT and those that struggle to access and use it (Shakina, Parshakov, and Alsufiev 2021).
- ▶ The corporate digital divide occurs at the regional, industry-type, and business-size levels (Pejic Bach, Zoroja, and Vuksic 2013). Usage gap (Pliskin et al. 2006).

### 3. The digital divide overview VI



#### The corporate landscape: research in Europe

- ▶ Out of 1641 articles retrieved, a second search within this sample found 32 articles addressing the corporate digital divide.
- ▶ Period 2000-2007: refers to the digital gap among firms sizes, especially in the access to - ICT and the implementation of e-business.

### 3. The digital divide overview VII



#### The corporate landscape: research in Europe

- ▶ Period 2008-2015: the focus shifted to analyzing firm readiness for digital technologies and skills. It also identified the factors that contribute to the digital divide among businesses.
- ▶ Period 2000-2022: emphasize digital skills and the advantages of DT. It also shows evidence from different countries.

## 4. Data I



- ▶ Specific search within titles and author keywords on the “*digital divide*” merging data from the Web of Science, Scopus, and Dimensions platforms.
- ▶ Search criteria: “digital divide\*” OR “digital inequalit\*” OR “digital gap\*”
- ▶ The sample includes articles, book chapters, conferences, and proceedings.
- ▶ Authors with European affiliations within the business, management, economics, technology, and computer science disciplines were included

## 4. Data II



- ▶ After conducting a thorough data cleaning, a total of 1641 unique documents from 2000 to 2022 were incorporated.
- ▶ To track the evolution of the digital divide literature, the data was divided into three periods: 2000-2007, 2008-2015, and 2016-2022.
- ▶ Document distribution
  - ▶ WoS: 946
  - ▶ Scopus: 286
  - ▶ Dimensions: 409
- ▶ The R programming language environment was used to carry out the analysis.

## 5. Bibliometric Analysis I



Following Donthu et al. (2021), Aria and Cuccurullo (2017), Ellegaard and Wallin (2015) and Bornmann and Mutz (2015) bibliometric analysis:

- ▶ Is a methodology that applies quantitative techniques to bibliographic data and plays a vital role in evaluating research output.
- ▶ This technique allows researchers to uncover emerging trends identifying knowledge gaps in specific domains.
- ▶ Is useful when analyzing a significant quantity of documents.
- ▶ It offers three types of analysis: performance analysis, science mapping, and network analysis.

## 5. Bibliometric Analysis II



### Descriptive Analysis

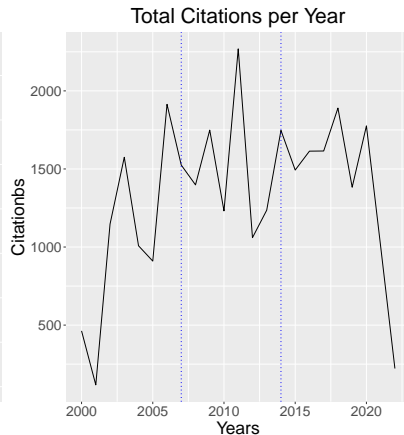
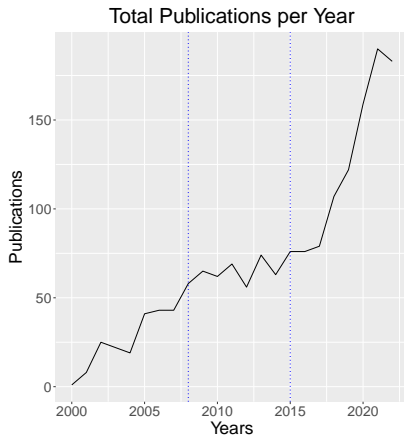
Details	Period.1	Period.2	Period.3	Total
Timespan	2000 - 2007	2008 - 2015	2016 - 2022	2000 - 2022
Journals	123	301	533	848
Annual growth rate	71.14	3.94	15.77	26.72
Average citations per doc	42.87	23.29	10.37	18.49
Total published documents	202	523	916	1641
Articles	159	354	748	1261
Book chapters	4	34	17	55
Proceeding papers	35	93	107	235
Conference papers	4	42	44	90



## 6. Performance Analysis I



### 6.1. Publications vs Citations

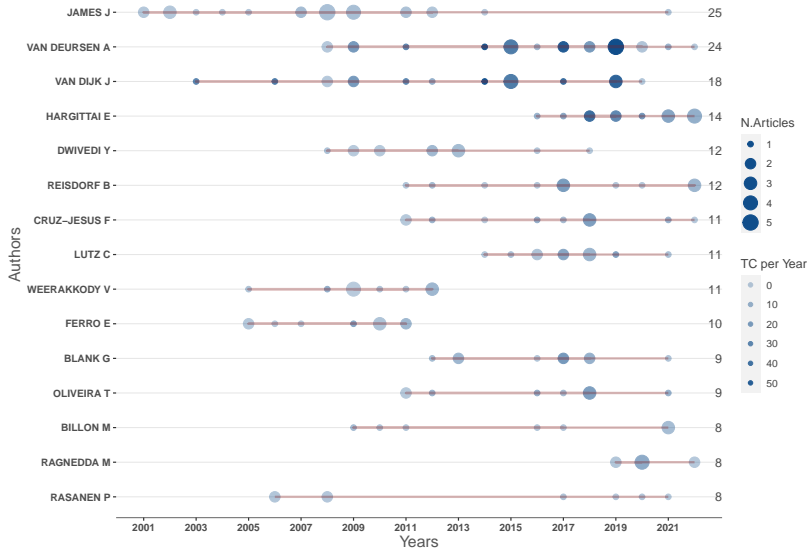


# 6. Performance Analysis I



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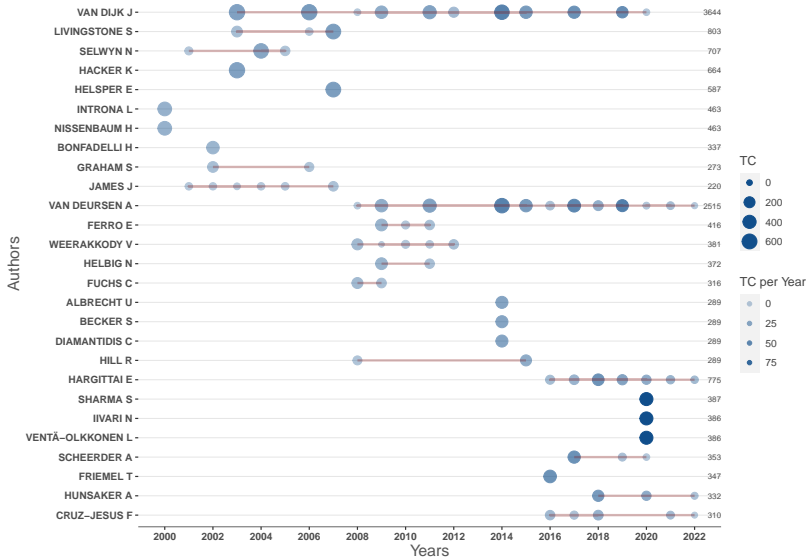
## 6.2. Evolving patterns in authors' scientific production over time.



# 6. Performance Analysis



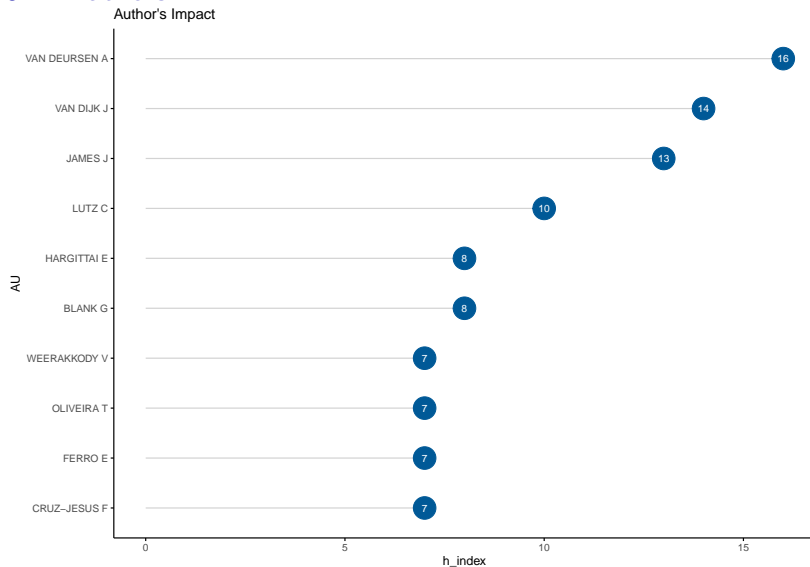
## 6.2. Trends in authors' citations over time



# 6. Performance Analysis



## 6.2. Authors II



## 6. Performance Analysis

### 6.3. Articles I



Table 1: Most Cited Articles

Rank	Article	TC
<b>Period 1: 2000- 2007</b>		
1	Van Dijk J; Hacker K (2003) -The Digital Divide As A Complex And Dynamic Phenomenon	664
2	Van Dijk J (2006) -Digital Divide Research, Achievements And Shortcomings	660
3	Livingstone S; Helsper E (2007) -Gradations In Digital Inclusion: Children, Young People And The Digital Divide	587
4	Selwyn N (2004) -Reconsidering Political And Popular Understandings Of The Digital Divide	560
5	Introna L; Nissenbaum H (2000) -Shaping The Web: Why The Politics Of Search Engines Matters	463
<b>Period 2: 2008- 2015</b>		
1	Van Deursen A; Van Dijk J (2014) -The Digital Divide Shifts To Differences In Usage	555
2	Van Deursen A; Van Dijk J (2011) -Internet Skills And The Digital Divide	402
3	Becker S; Miron-Shatz T; Schumacher N; Krocza J; Diamantidis C; Albrecht U (2014) -Mhealth 2.0: Experiences, Possibilities, And Perspectives	289
4	Helbig N; Gil-García J; Ferro E (2009) -Understanding The Complexity Of Electronic Government: Implications From The Digital Divide Literature	268
5	Carter L; Weerakkody V (2008) -E-Government Adoption: A Cultural Comparison	208
<b>Period 3: 2016- 2022</b>		
1	Iivari N; Sharma S; Ventä-Olkkonen L (2020) -Digital Transformation Of Everyday Life – How Covid-19 Pandemic Transformed The Basic Education Of The Young Generation And Why Information Management Research Should Care?	386
2	Friemel T (2016) -The Digital Divide Has Grown Old: Determinants Of A Digital Divide Among Seniors	347
3	Scheerder A; Van Deursen A; Van Dijk J (2017) -Determinants Of Internet Skills, Uses And Outcomes. A Systematic Review Of The Second- And Third-Level Digital Divide	307
4	Hunsaker A; Hargittai E (2018) -A Review Of Internet Use Among Older Adults	223
5	Van Deursen A; Van Dijk J (2019) -The First-Level Digital Divide Shifts From Inequalities In Physical Access To Inequalities In Material Access	198

<sup>1</sup> Source: Author's elaboration

<sup>2</sup> TC: Times Cited

## 6. Performance Analysis



### 6.3. Articles II

Table 2: Most Cited References

Rank	Article	TC
1	Norris P (2001) -Digital Divide Civic Engagement, Information Poverty, And The Internet Worldwide	204
2	Van Dijk J (2005) -The Deepening Divide: Inequality In The Information Society	172
3	Hargittai E (2002) -Second-Level Digital Divide: Differences In People's Online Skills	136
4	Van Dijk J (2006) -Digital Divide Research, Achievements And Shortcomings	129
5	Van Dijk J, Hacker K (2003) -The Digital Divide As A Complex And Dynamic Phenomenon	114
6	Selwyn N (2004) -Reconsidering Political And Popular Understandings Of The Digital Divide	108
7	Dimaggio P, Hargittai E, Celeste C, Shafer S (2004) -From Unequal Access To Differentiated Use: A Literature Review And Agenda For Research On Digital Inequality	105
8	Van Deursen A, Van Dijk J (2014) -The Digital Divide Shifts To Differences In Usage	103
9	Zillien N, Hargittai E (2009) -Digital Distinction: Status-Specific Types Of Internet Usage	82
10	Hargittai E, Hinnant A (2008) -Digital Inequality: Differences In Young Adults' Use Of The Internet	80

<sup>1</sup> Source: Author's elaboration

<sup>2</sup> TC: Times Cited

## 6. Performance Analysis



### 6.4. Journals

Table 3: Journals' Performance

Rank	Journals	TC	PD
1	New Media & Society	4427	42
2	Information Society	2066	26
3	Information Communication & Society	1165	43
4	Government Information Quarterly	965	15
5	Telecommunications Policy	961	34
6	Poetics	945	6
7	Telematics And Informatics	921	21
8	Computers In Human Behavior	837	15
9	Universal Access In The Information Society	590	15
10	European Journal Of Communication	447	6

<sup>1</sup> Source: Author's elaboration

<sup>2</sup> TC: Times Cited

<sup>3</sup> PD: Published Documents

## 6. Performance Analysis



### 6.5. Affiliations/ Universities

Table 4: Top 10 University's Performance

Rank	University	TC	PD
1	Univ Twente	4085	31
2	London Sch Econ And Polit Sci	2195	24
3	Univ Zurich	1581	26
4	Univ Oxford	1037	38
5	Cardiff Univ	793	10
6	New Mexico State Univ	664	1
7	Brunel Univ London London	660	15
8	Univ Oviedo	526	10
9	Univ Loughborough	501	16
10	Tilburg Univ	464	29

<sup>1</sup> Source: Author's elaboration

<sup>2</sup> TC: Times Cited

<sup>3</sup> PD: Published Documents



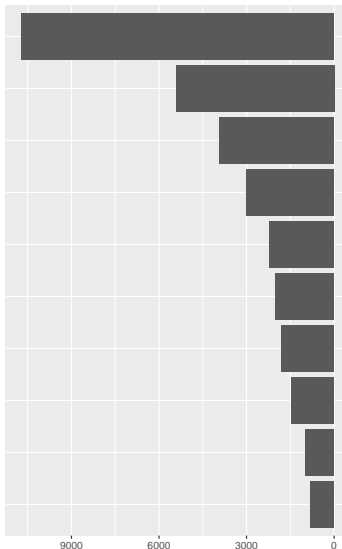
# 6. Performance Analysis



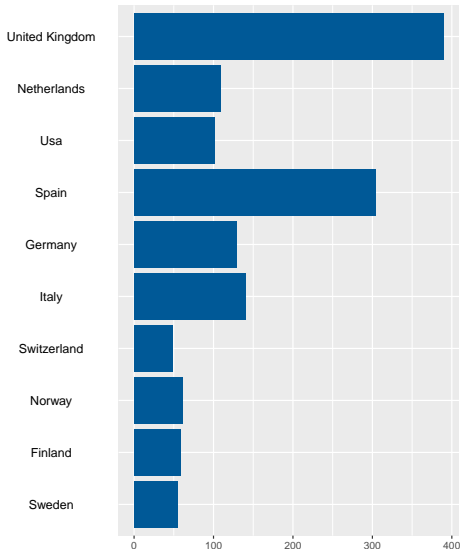
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## 6.5. Countrys' Performance

Countries' Citations



Countries' Published Docs



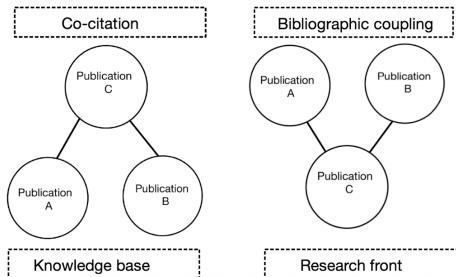
## 7. Science Mapping



### Similarity measures

Following Kammerer et al. (2021)

- ▶ **Research base:** cluster of academic publications in a research field that are considered fundamental to the development and understanding of the field.
- ▶ **Research front:** cluster of academic publications that refers to emerging active areas of research considering themselves with a similar unsolved research problem.

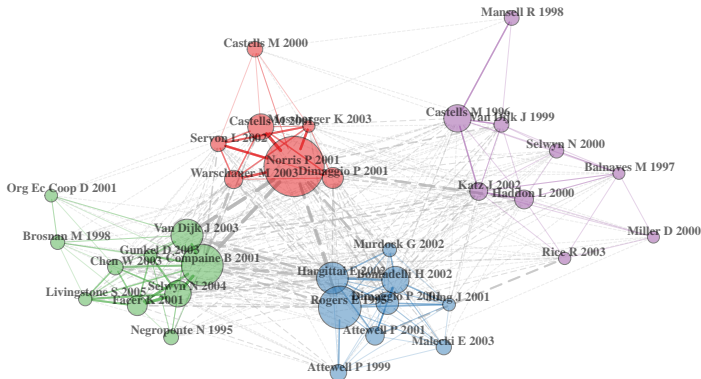


## 7. Science Mapping



This network shows the emergence of the literature on the digital divide

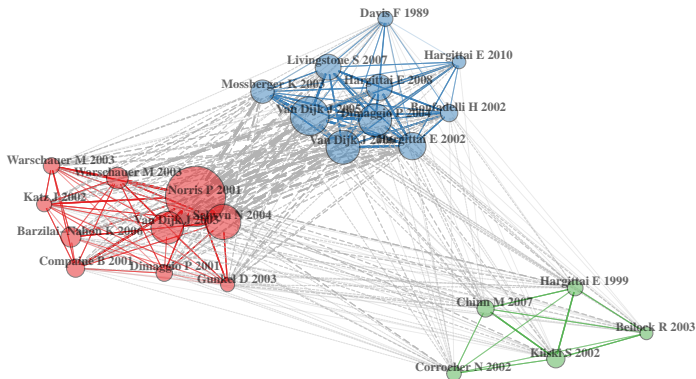
**Co-Citation Network, 2000 – 2007**



# 7. Science Mapping



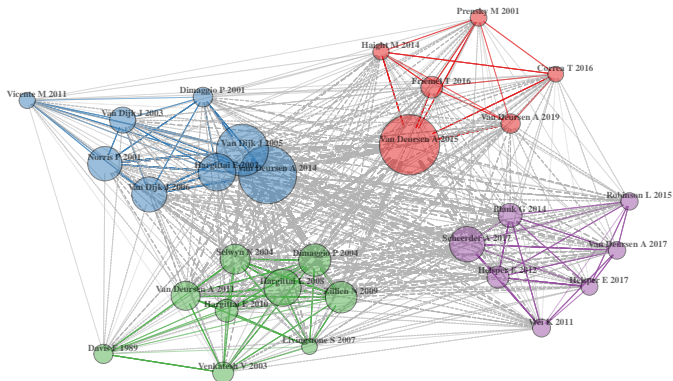
Co-Citation Network, 2008 – 2015



# 7. Science Mapping



Co-Citation Network P3 louvain



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