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Electronic Journal of Information System in Developing Countries (2014-2021): A Bibliometric Study

Azeem Akbar

University of the Punjab Lahore Pakistan, azeemakbar54@gmail.com

Ayesha Gulzar

University of Sargodha, ayeshagulzar3890@gmail.com

Nadeem Siddique

Lahore University of Management Sciences, nadeemsiddique@gmail.com

Muhammad Ajmal Khan

Imam Abdulrahman Bin Faisal University, Dammam, Kingdom of Saudi Arabia, majmalkhan@gmail.com

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1 **Electronic Journal of Information System in Developing Countries (2014-2021):**

2 **A Bibliometric Study**

3
4 Azeem Akbar* (Corresponding Author)

5 Ph.D. Scholar, Department of Information Management, University of the Punjab
6 Librarian, Government Raza Farooq Memorial Library, Pirmahal, Toba Tek Singh
7 Azeemakbar54@gmail.com

8
9 Ayesha Gulzar

10 M. Phil Scholar

11 University of Sargodha

12 Ayeshagulzar3890@gmail.com

13
14 Nadeem Siddique

15 Gad and Birgit Rausing Library

16 Lahore University of Management Sciences

17 nadeemsiddique@gmail.com

18
19 Muhammad Ajmal Khan

20 HoD Library Quality and Academic Accreditation

21 Deanship of Library Affairs,

22 Imam Abdulrahman Bin Faisal University, Dammam, Kingdom of Saudi Arabia

23 majmalkhan@gmail.com

24

25 **Abstract**

26 Electronic Journal of Information System in Developing Countries (EJISDC) has already
27 published a bibliometric study from 2000-2013, and this study is a further continuation of the
28 pervious study from 2014-2021. The data retrieved from the Scopus database was analyzed
29 through VOS viewer, biblioshiny, Microsoft Excel, and MS Access. This bibliometric study
30 found the different aspects of the EJISDC, i.e., document types, publishing trends, authorship
31 patterns, most productive countries, prolific authors, organizations, frequently used keywords,
32 and country collaboration during 2014-21. The result found that total 346 publications having
33 1513 citation and most of the documents type was published research articles. The maximum
34 publication was 51 in 2017 and received 313 citations in 2014. Authorship patterns showed that
35 two author patterns produce maximum publications (142) with 666 citations. Heeks was the most
36 prolific author in terms of paper publication (8 papers). South Africa and the University of Cape
37 Town are at the top of the list to produce maximum articles during 2014-21. ICT4D was the most
38 used keyword by the authors, and Tanzania is the top country to collaborate with other countries.
39 Results for this study showed that the publications trend had been changed during 2014-21.

40 *Keywords:* Journal bibliometrics, EJISDC, authorship patterns, publishing trends, author
41 keywords.

42

43

44 **Introduction**

45 Bibliometrics is a blend of two words, 'Biblio' and 'metrics'. Biblio is the determination of Latin
46 and Greek word 'Biblion', which means book or paper. The word metrics implies the study of
47 meter i.e., estimation, an induction of the Greek word 'Metrikon'. Thus, Bibliometrics has
48 something to do with the measurement of the books. As such, bibliometrics is a part of science,
49 which considers information behavior (Hussain & Fatima, 2011). Bibliometrics refers to the use
50 of statistical methods to evaluate articles, books, and publications. It is sometimes referred to as
51 scientometrics. Using the statistical approach, bibliometrics quantifies the publications and
52 articles, authors, and the journals they are published in. Pritchard (1969) coined the term
53 'Bibliometric' in 1969. According to him, Bibliometrics is a process that unfolds the secrets
54 behind any written thing. It focuses on written communication, its nature, and the course of a
55 discipline. It makes use of a quantitative approach and examines numerous facets of written
56 communication.

57 Researchers and students rely heavily on journals for data and literature reviews.
58 Therefore, Bibliometrics has become one of the forefront fields. It is quickly becoming known
59 for its diverse range as it covers different branches of study fields. Other than counting the
60 numbers of publications and articles, one other area of bibliometrics is citation analysis. The
61 advantage of citation analysis lies in knowing the pattern of citations. Which journals are the
62 ones with the most citations? What articles have the greatest number of citations? Therefore, this
63 area of bibliometrics opens a different window.

64 Another zone to explore in bibliometrics is the documentation of courses in different
65 fields of research. Some articles and journals pose a specific effect on the related research. One
66 journal of a specific discipline can have an impact on another field. Bibliometrics studies this

67 relationship (Desaj, 2003). Most of the time, bibliometrics revolve around scientific research.
68 Keeping a record of all the writings and published content creates a vast database that helps you
69 verify the studies (Das, 2013). Bibliometrics, in simple words, is a secure history. It is the
70 baseline of any research you might opt for, as every person has to know what the trend and
71 indicators before his work were.

72 All the indicators and trends that come into light through the quantitative study of
73 journals provide the answers to innovation scarcity. What new innovations are needed? What
74 changes must be made, and what should be kept constant? The statistical approach used in
75 bibliometrics uncovers these points and gives solutions to some extent.

76 **Research Questions**

- 77 1. What are the most frequently used document types in EJISDC during 2014-21?
- 78 2. What are the publishing trends on EJISDC from 2014 to 2021?
- 79 3. What are the authorship patterns of research in EJISDC from 2014 to 2021?
- 80 4. What are the most productive countries, authors, and organizations on EJISDC from 2014
81 to 2021?
- 82 5. What are the most frequently used keywords in EJISDC from 2014 to 2021?
- 83 6. What are the country collaboration patterns of research in EJISDC from 2014 to 2021?

84 **Literature Review**

85 Mani (2014) highlighted the trends of collaboration and authorship patterns in the Malaysian
86 Journal of Library and Information 1996-2012. The research included that 575 total authors
87 contributed in this period and has 279 research articles. The research finding showed that most of
88 the research papers collaborated with two authors (111, 39.785%). Zainab A. N is the most

89 prolific contributor with 41 publications. Malaysia is the highest contribution in the MJLIS with
90 239 articles. Tsay and Shu (2011) investigated the citation analysis of articles published from
91 1998-2008 in the Journal of Documentation through bibliometrics analysis. Their research
92 finding revealed that most of the documents cited by other authors are journal articles, i.e., 336.
93 Library science is the highest cited subject. Roy and Basak (2013) worked on a similar
94 bibliometrics study in the Journal of Documentation. The research focused on literature
95 published from 2001 to 2010. This bibliometrics study examines authorship pattern, degree of
96 collaboration, the geographical distribution of papers, and citation analysis. The findings
97 revealed that most published articles were multi-authored. The significant results of the study are
98 that most articles were published by a single author (49.5%). Nigel Ford is the most prolific
99 author during this period. The United Kingdom is the highest production of research 79, 32.11%
100 during this period.

101 Das (2013) mentioned that 206 research articles were published in Library Trends during
102 2007-2012. The focus of this bibliometrics study was the contribution of authors and citation
103 analysis. The total numbers of articles were 206 during 2007-12. Out of the 206 articles, most
104 articles were published in 2007-2008. Single authorship is the most common pattern. The total
105 number of citations was 6582 during the period of 2007-12. Onyanha and Onyango (2020) put
106 forward a bibliometric perspective regarding web science data. The study examined Information
107 and Communication Technology (ICTs) for agriculture in sub-Saharan Africa during 1991-2018.
108 The data was retrieved from the web of science, and the result found that ICT agriculture occurs
109 mostly in dairy, animal sciences, agronomy. There are three countries USA, France, and
110 England, having more contribution in ICT agriculture.

111 Haq et al. (2020) did a bibliometric study on the Journal of the Association for
112 Information Science and Technology (JASIST) through a retrospective study method. The data
113 were gathered from the Web of Science (WOS). The study found that 62 countries published
114 1196 total documents during 2014-2019. Most of the documents are research papers (1021). The
115 total number of citations was received 11,941 in this period. Ahmad et al. (2020) conducted a
116 study of Arab World research from 1980-2020 through the bibliometric method. The result found
117 that Egypt has dominated the country to research production and Saudi Arab has more citation
118 30.86% during this period. Chen et al. (2020) worked on citation analysis and found out how the
119 Chinese library affected information science regarding outer disciplines. It includes 20 Chinese
120 library journals and the publication analysis done in these journals from 1996 to 2015. A total of
121 469 journals of outer disciplines were studied. The study's findings showed that communication,
122 computer science, and business management have more citations to Chinese library and
123 information science journals. The library science related articles are rarely cited in this journal.
124 Bakri and Willett (2017) documented the Malaysian Journal of Library and Information science.
125 The bibliometric analysis consists of publications from 2001 to 2006. The total number of
126 published documents was 170. Out of these documents, most of the documents were research
127 articles, i.e., 85. There were two authorship patterns in most of the articles, and authors by
128 geographical affiliation were found that Malaysia is top of the list. Citation analysis of 161
129 articles was performed. At least 14% of 161 articles were cited from the said journal. Another
130 similar study by Tiew et al. (2001) was conducted on this journal documented publication during
131 a period from 1996 to 2000. The finding of the study was total published articles were 76, and
132 most of the documents were research articles 69.74%. A single author pattern was used in most
133 of the articles. Malaysia is at the top of the list of most publications in the MJLIS.

135 **Electronic Journal of Information System in Developing Countries**

136 Electronic Journal of Information Systems in Developing Countries (EJISDC) was established in
137 2000. EJISDC cover all kind of studies and research in a global context. Now, it becomes a
138 notable and trusted platform where many researchers share their work and are getting
139 recognized. To this day, a total of 700 articles have been published in this journal. The UN has
140 verified it, with a readership from 124 countries (Naude, 2016). It takes up 8% of space among
141 the five journals that publish 40% of papers (Kate et al., 2013). All the publications are about
142 developing countries as its main aim is to record whatever research is done in primarily these
143 areas.

144 **Methodology**

145 The study employed a quantitative-based bibliometric method to quantify the selected categories
146 to fulfill the study objectives. The search query was “Electronic Journal of Information Systems
147 in Developing Countries” from the period of 2014-2021. For this purpose, EJISDC was selected,
148 and the following categories, i.e., type of documents, year of publication, author impact, country
149 impact, global collaboration, author keywords, were explored. The data were retrieved from the
150 Scopus database index on a single sitting, i.e., April 10, 2021. The research articles, conference
151 papers, editorial, and erratum, were included in the time span from 2014-2021 (8 years). Data
152 were analyzed through VOSviewer, Biblioshiny, Microsoft Excel, and MS Access.

153 **Data Analysis & Interpretation**

154 **Document Type Analysis**

155 The total number of publications, citations, and citations per year is given in Table 1 for the
156 distribution of document types. There are four types of documents listed by Scopus. It shows that

157 the most common type of document is the article category that includes 326 publications with
158 1462 citations. The conference paper includes are 10 with 45 citations. According to total
159 publications and total citations, the article and conference paper ranked 1st and 2nd.

160 Table 1

161 *Used Document Type*

Type of Document	TP	TC
Article	326	1462
Conference paper	10	45
Editorial	9	6
Erratum	1	0
Total	346	1513

162

163 **Year-wise Analysis**

164 Table 2 shows the distribution of research papers published from 2014 to 2021. There were 346
165 research papers published from 2014 to 2021. It has been found that maximum papers (51) were
166 published in 2017, having citations 277 with a ratio of 5.43% citations per year. The second most
167 publication in 2016 is 50 and has 234 with a ratio of 4.68% citations per year. In 2014 total of 49
168 articles were published, having the highest citations 313 with a ratio of 6.36 citations per year. In
169 the year 2021, only 21 articles were written by different authors having the lowest citation one
170 with a ratio of 0.05 per year.

171

172 Table 2

173 *Distribution of Research Papers per Year*

Years	Publications	Citations	Impact Factor
2014	49	313	6.39
2015	46	272	5.91
2016	50	234	4.68
2017	51	277	5.43
2018	45	227	6.16
2019	45	147	3.26
2020	39	42	1.08
2021	21	1	0.05

174

175 **Authorship Pattern**

176 Table 3 describes the authorship pattern of EJISDC. It is observed that on EJISDC,
177 publications were published as a single-author and 142 publications as two authors, respectively.
178 The trend of collaborative publications was dominant in this area, having the highest numbers of
179 publications; for instance, as two authors, the number of publications was 142. As three authors,
180 the number of publications was 78.

181 Table 3

182 *Authorship Pattern*

Authorship	Publications	Citations
1	81	273
2	142	666
3	78	374
4	32	141
5	5	31
6	4	19
7	3	8

183

184 **Top Productive Authors**

185 Table 4 displays the most prolific author’s impact through publications and citations,
 186 emphasizing total publication, total citation, and publication start Year, h-index, g-index, and m-
 187 index. The productive author presented the following in Table 4. Heeks was the most productive
 188 author who published eight articles with 46 citations, followed by, Etoundi the second most
 189 productive author to publish six articles with 11 citations. On the author’s main quality
 190 parameters, i.e., h-index, g-index, and m-index, Heeks ranked first with h-index value five, g-
 191 index value is six, and m-index is 0.833%. Thapa ranked second with h-index value four, g-index
 192 value six, and m-index 0.5. Thapa has published only six papers and having the highest citation
 193 63. Table 4

194 *Top 10 Productive Authors*

Author	h-index	g-index	m-index	TC	NP	PY-start
Heeks	5	6	0.83	46	8	2016
Etoundi	2	3	0.33	11	6	2016
Gomez	2	3	0.33	15	6	2016
Thapa	4	6	0.5	63	6	2014
Iyamu	2	4	0.29	24	5	2015
Kyobe	3	3	0.38	16	5	2014
Abbott	3	4	0.43	25	4	2015
Alexander	3	4	0.36	22	4	2014
Bass	2	4	0.25	38	4	2014
Dasuki	3	4	0.43	17	4	2015

195

196

197

198 **Top Articles Analysis**

199 Table 5 shows the top articles exploring the link between ICT and development in the context of
 200 developing countries: a literature review having the highest 45 citations, which is published in
 201 2014 by Thapa and Sb, while Cloud computing: adoption issues for Sub-Saharan African SMEs
 202 having the 28 citations which are published in 2014 by Abubakar; Bass and Allison.
 203 Determinants of online waqf acceptance: an empirical investigation has the minimum citation 18
 204 which is published in 2014 by Amin; Abdul-Rahman; Ramayah; Supinah, and Mohd-Aris.

205 Table 5

206 *Top Most Cited Articles*

Articles	Authors	TC	PY
Exploring the link between ICT and development in the context of developing countries: a literature review	Thapa D; SB, O	45	2014
Cloud computing: adoption issues for Sub-Saharan African smes	Abubakar AD; Bass JM; Allison, I	28	2014
Using learning analytics to predict students' performance in moodle learning management system: a case of mbeya university of science and technology	Mwalumbwe, I; Mtebe JS	28	2017
A model for assessing learning management system success in higher education in Sub-Saharan countries	Mtebe JS; Raisamo R	27	2014
The impact of e-wallet on informal farm entrepreneurship development in rural Nigeria	Uduji JI; Okolo-Obasi EN; Asongu SA	25	2019
Deployment of enterprise architecture in the namibian government: the use of activity theory to examine the influencing factors	Shaanika I; Iyamu T	20	2015

User acceptance of mobile payment: the effects of user-centric security, system characteristics and gender	Lwoga ET; Lwoga NB	20	2017
Community mapping in urban informal settlements: examples from Nairobi, Kenya	Panek J; Sobotova L	19	2015
A citizen-centric framework for assessing e-government effectiveness	Sigwejo A; Pather S Amin H; Abdul-Rahman	19	2016
Determinants of online waqf acceptance: An empirical investigation	Ar; Ramayah T; Supinah R; Mohd-Aris M	18	2014

207

208 **Top Countries**

209 Table 6 shows that most of the publications, citation by countries. The result showed that South
 210 Africa had published 94 papers with 443 citations, the United Kingdom has 35 published
 211 documents with 184 citations, and Norway has 28 publications with 127 citations is the topmost
 212 publishing country. It has been found that South Africa also has the highest citations' country.
 213 While the United States has more articles but low citations as compared with Tanzania. Further,
 214 Sweden is also a more cited country than the United States.

215 Table 6

216 *Country wise Distribution of Publications, Citations, and Citations Per Year*

Country	TP	TC	Citation Impact
South Africa	94	443	4.712766
United Kingdom	35	184	5.257143
Norway	28	127	4.535714
United States	28	89	3.178571
Tanzania	23	186	8.086957

Sweden	18	104	5.777778
Australia	17	77	4.529412
India	14	41	2.928571
Cameroon	12	26	2.166667
Nigeria	11	54	4.909091

217

218 **Organization Analysis**

219 The top 10 organizations in respect to highly producing research publications in EJISDC are
 220 shown in Table 7, with their research impact. The University of Cape Town is the most
 221 productive organization, which produced 25 articles with 108 citations. The second most
 222 productive institution is the University of South Africa which produced 19 articles with 60
 223 citations. Further, the University of Oslo has published 19 articles with 41 citations. The Cape
 224 Peninsula University of Technology has published 17 publications and has 84 citations.
 225 University of Washington, Seattle was published the minimum number of publications (4) with
 226 three citations.

227 Table 7

228 *Top 10 Highly Productive organizations*

Organizations	TP	TC
University of Cape Town	25	108
University of South Africa	19	60
University of Oslo	19	41
Cape Peninsula University of Technology	17	84
University de Yaoundé I	12	24

University of Dar Es Salaam	10	91
University of Agder	8	83
The University of Manchester	8	46
Stockholm University	7	21
University of Washington, Seattle	4	3

229

230 **Top Keywords**

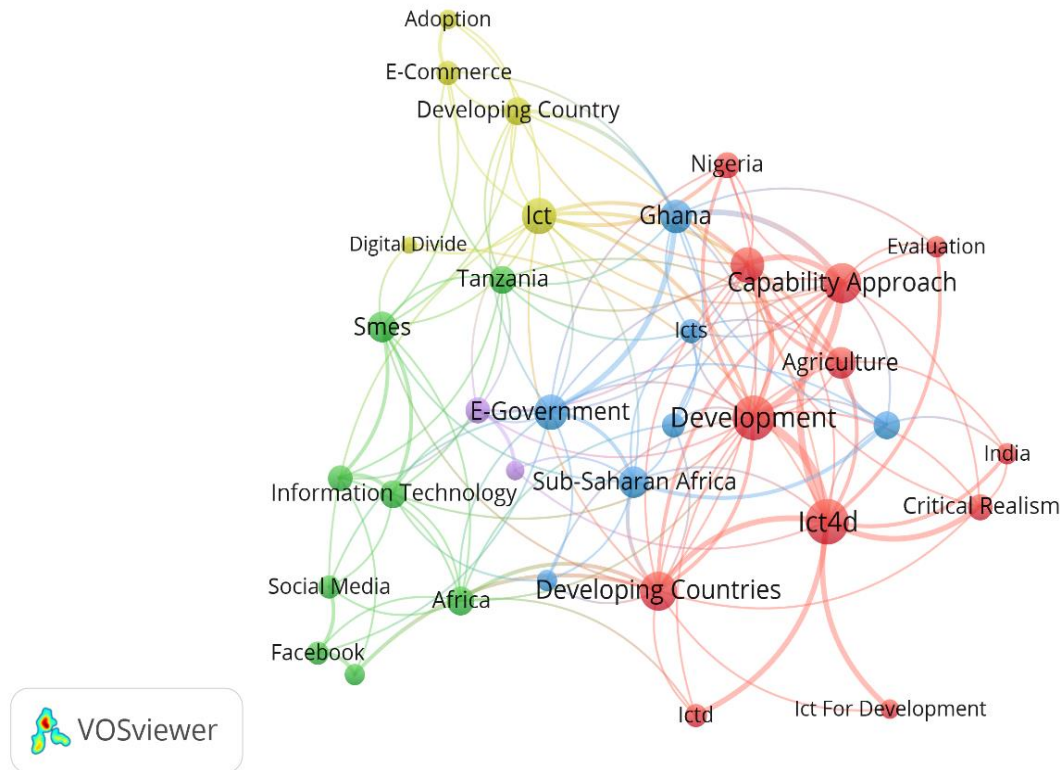
231 **Visualizations of author’s keywords co-occurrences based on full counting**

232 The minimum number of author keywords selected was 5. There were a total of 1174 author
233 keywords, and 34 sources met the thresholds. The total strength of the co-occurrence links with
234 other keywords was calculated for each of the 34 sources. The keywords of the authors with the
235 greatest total link strength were selected. The total number was 34, cluster seven, links 137, and
236 the total link strength was 188. Cluster one is red color contains eight keywords: Africa,
237 Alignment, E-government, Facebook, Implementation, Information Technology, Social Media,
238 and South Africa. Second cluster is green contain seven keywords which includes Adoption,
239 Developing Country, Digital Divide, E-commerce, ICT, Smes and Tanzania. Third cluster is blue
240 contain six keywords which includes Capability approach, Development, Evaluation, Ghana,
241 ICTs and Mobile Money. And cluster four is yellow contain 5 keywords which include
242 Agriculture, Critical Realism, India, Mobile Phone and Mobile Phones. Cluster five is purple
243 contain four keywords which includes Developing Countries, ICT for development, ICT4d and
244 ICTD. Cluster six is Sky-Blue contain three keywords which includes health Information
245 Systems, Social Network Analysis and Sub-Saharan Africa. Cluster Seven is orange color
246 contain one keyword which includes Nigeria.

247

248 Figure 1

249 *Co-occurrences of Author's Keywords Analysis*



250

251 **Country Collaboration Analysis**

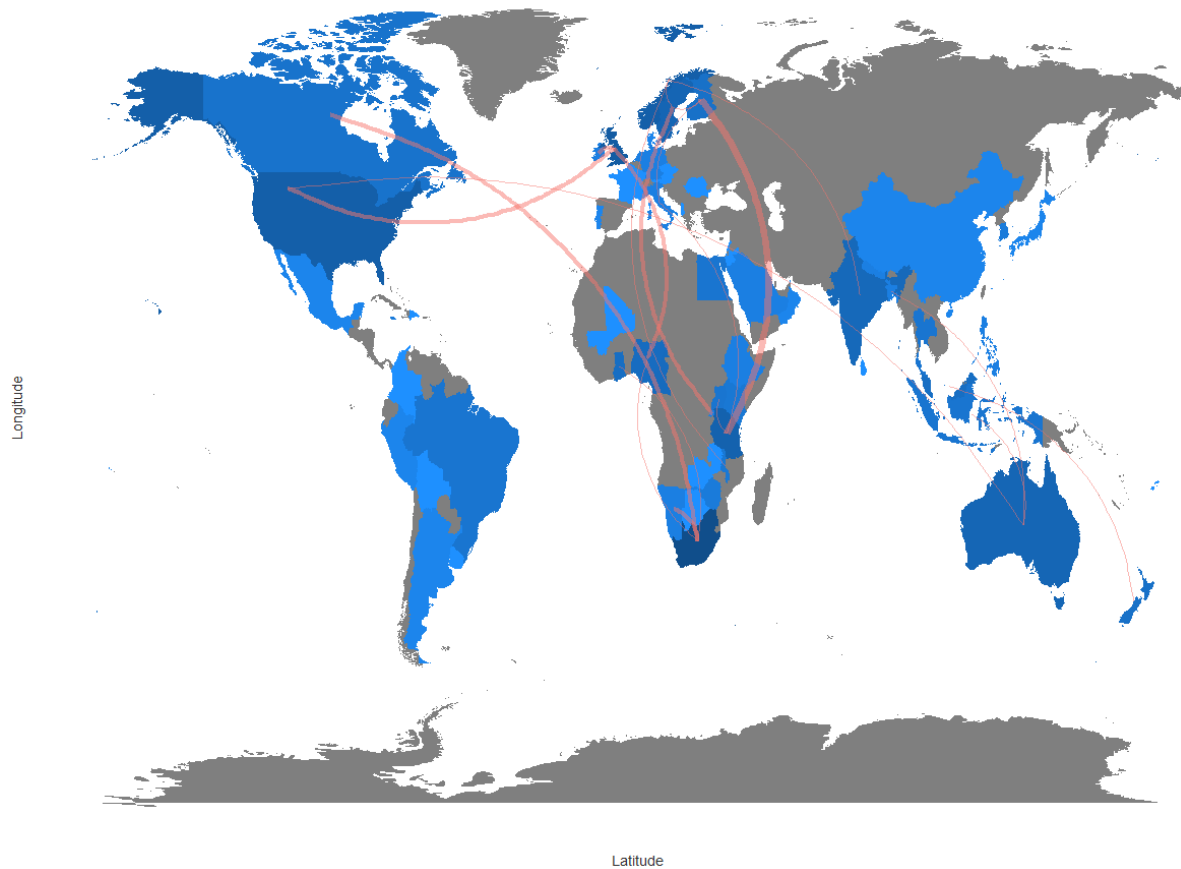
252 Figure 2 shows the collaboration of the top 10 countries on EJISDC. Tanzania is the top
253 collaborator country with Finland (5 publications). Nigeria has a collaborator with the United
254 Kingdom (3), South Africa with Canada (3), and Namibia (3), followed by Sweden with Rwanda
255 (3). Some countries published few collaborative publications, for example, Australia with
256 Bangladesh (2), Indonesia (2), and USA (2), etc.

257

258

259 Figure 2

Country Collaboration Map



260

261 **Three-Factor Analysis (Countries, Authors, and keywords)**

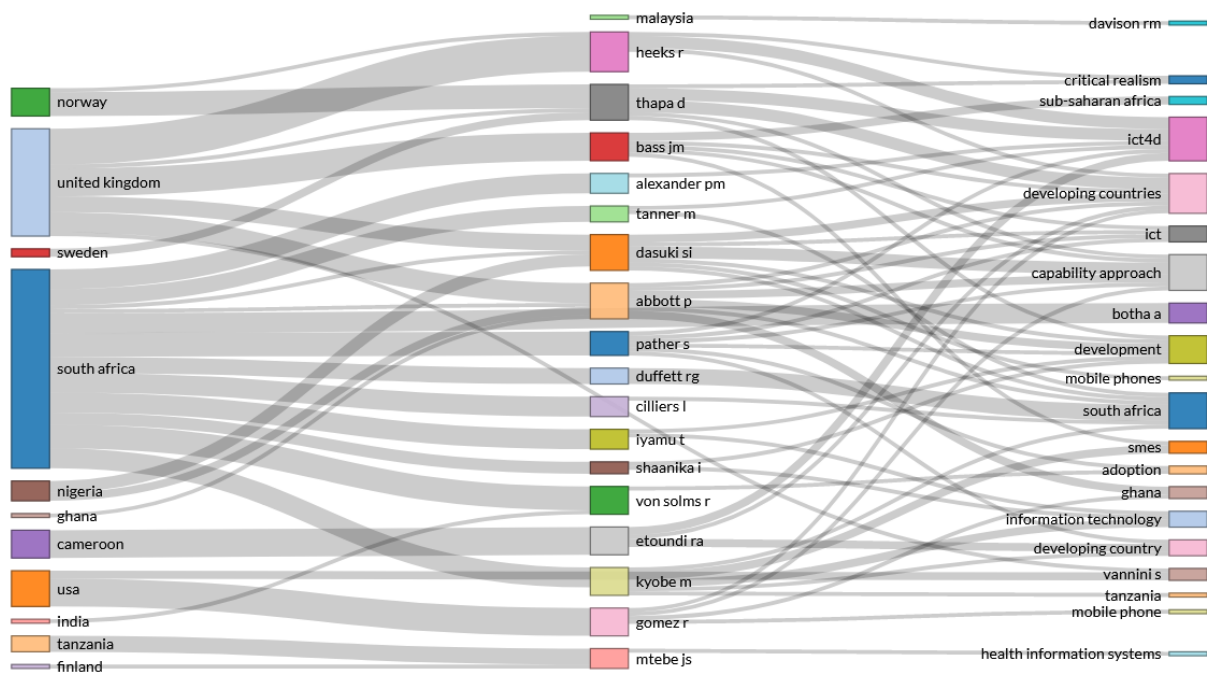
262 Figure 3 presents the published literature on EJISDC by focusing on the relationship among top
263 country (left), authors (middle), and keywords (right). The figure shows the top authors Heeks,
264 Etoundi, Gomez, Kyobe, and Thapa published their literature in these countries Norway, United
265 Kingdom, South Africa, and the USA using these keywords ICT4D, capability approach,
266 development, developing countries, and South Africa, etc.

267

268 Figure 3

269 *Three Factor Analysis of the relationship between Countries (left), Authors(middle) and*

270 *keywords(right)*



271

272 **Three-factor Analysis (Keywords, Authors and organizations)**

273 Figure 4 shows the relationship between the top 10 keywords, countries, and organizations on

274 EJISDC. The top five keywords (ICT4D, developing countries, capability approach, e-

275 government) have strong relations with the top five countries (South Africa, United Kingdom,

276 Tanzania, Finland, and Norway). Accordingly, different colors are also shown associational links

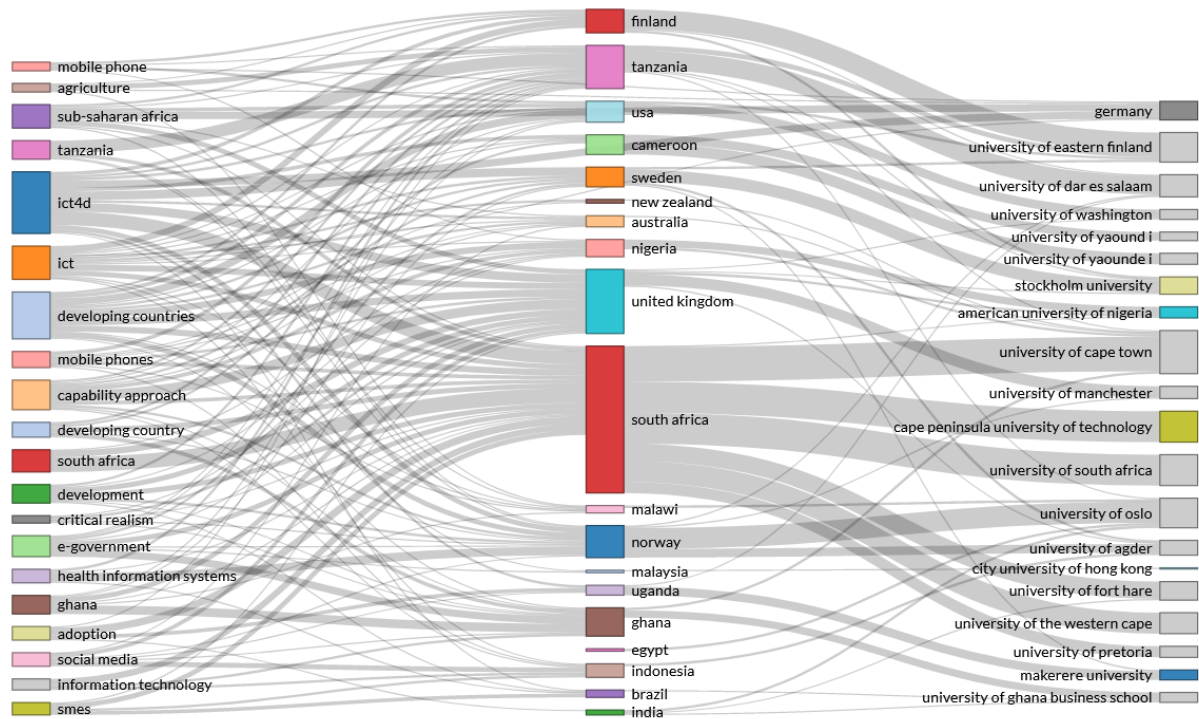
277 with the organization (the University of Cape Town, University of South Africa, University of

278 Oslo, University of Eastern Finland, and the Cape Peninsula University of Technology).

279

280 Figure 4

281 Three-Factor Analysis of the relationship between keywords (left), Authors (middle), and
282 organizations (right)



283

284 Discussion

285 EJIDC is the leading journal of China that covers different subjects of social sciences and
 286 computer sciences. The finding of the EJIDC bibliometric study is very interesting in respect to
 287 the previous study, which was covering the 2000-2013 time period. The total numbers of
 288 published documents were 346 during 2014-21, and out of the total number of documents, only
 289 326 were research articles. The previous study mentioned that 378 articles were published during
 290 14 years span (2000-2013). This showed that EJIDC publications increased with the passage of
 291 time. The research publication was gradually increased from 2014 to 2017 i.e., 49 to 51

292 respectively, but other hand, the result of a citation is decreased from 313 to 277 in the same
293 year. The most prolific author was Heeks, who published eight articles and having forty-six
294 citations. Heeks had five h-index, six g-index (6) 0.833 m-index. Thapa has published only six
295 articles and having sixty-three citations. Thapa had four h-index, six g-index, and 0.5 m.index.
296 During 2000-2013 the most prolific author was Gomez, R., who is belonging to the USA and
297 having seven publications. The most cited paper was “Exploring the link between ICT and
298 development in the context of developing countries: a literature review,” having the highest 45
299 citations, which is published in 2014 by Thapa, and SB. The second most cited papers were
300 “Cloud computing: adoption issues for Sub Saharan African SMEs by Abubakar et al.” and
301 “Using learning analytics to predict students' performance in model learning management
302 system: a case of Mbeya university of science and technology by Mwalumbwe and Mtebe having
303 28 citations respectively. There was a total of 1174 keywords. ICT4D and developing countries
304 are top of the keywords used by authors. The most publication by the country was South Africa
305 94 publication with having 443 citations during 2014-2021. The United Kingdom is the second
306 country that contributed 35 publications hand having 184 citations. The data was revealed that
307 the two authors' collaboration is the highest at 142 with 666 citations during 2014-2021. The
308 same 2 author collaboration was found, i.e., 136 articles were published by two-author
309 collaboration during 2000-2013. In the year 2014 total number of collaborations was 118; out of
310 this, 11 were single, and 107 was multiple collaboration.

311 **Limitation**

312 There are certain limitations in the present study. Firstly, the data was taken from only Scopus.
313 The search query and the time period were 2014-2021. This study was limited to research
314 articles, conference papers, editorials, erratum, and the English language.

315

316 **Conclusion**

317 The Electronic Journal of Information Systems in Developing Countries is a peer-review journal
318 of China. This study is the second bibliometric study of EJISDC from 2014-2021, but the first
319 study covered the period 2000-2013. The data was retrieved through only the Scopus database.

320 This bibliometric study showed that authorship patterns also changed over the years with the
321 increase of different types of publications in different years. The paper also indicated the top-

322 cited papers, prolific authors, top keywords, authorship collaboration, and country

323 collaborations. Data were analyzed through VOSviewer, Biblioshiny, and Microsoft Excel.

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