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Decoding Digital Anthropology: A scopus-based bibliometric exploration

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ABSTRACT

Purpose: The study aimed to conduct a bibliometric analysis of digital anthropology to map its intellectual landscape, identify core research trends, recognize influential scholars, and examine collaborative networks among researchers and countries. It sought to provide systematic insights into the growth and direction of this emerging interdisciplinary field.

Methodology: Data were collected from the Scopus database in July 2024 using a focused search strategy combining the terms digital and anthropology. The analysis was limited to English-language publications. Bibliometric techniques were applied using VOSviewer to examine citation patterns, bibliographic coupling, co-authorship networks, and keyword co-occurrence. These methods enabled visualization and interpretation of thematic structures and collaborative relationships within the field.

Findings: The findings indicate that research in digital anthropology is primarily led by scholars from the United Kingdom, the United States, and Italy, with growing contributions from India and other emerging economies. The study revealed extensive international collaboration, involving researchers from 20 to 50 countries. Core research themes highlight the intersection of digital technologies and anthropological inquiry, while underexplored areas include artificial intelligence, large-scale data analysis, and region-specific field-based studies.

Implications: The study provides valuable guidance for researchers entering the field of digital anthropology and offers insights for

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research institutions in setting funding priorities. It also emphasizes the need for comparative, inclusive, and methodologically diverse research to strengthen global perspectives and advance future developments in digital anthropology.

Keywords: Digital Anthropology, Bibliometric Analysis, VOSviewer, Digital Ethnography, Research Collaboration Networks, Social Media Studies

1. INTRODUCTION

Digital technologies have immensely influenced and transformed human social life across the globe. Resulting in rise to new forms of communication, community, and cultural expression. From social media platforms like Facebook and WeChat to smartphones these have become essential and constant companions to us. Digital anthropology emerged from the recognition that online and offline worlds cannot be meaningfully separated (Miller & Horst, 2012). Anthropologists have demonstrated and shown that digital and physical experiences are deeply intertwined with each other shaping the other in complex ways (Bluteau, 2019). The field has grown rapidly since the early 2000s, expanding from initial studies of virtual communities (Wilson & Peterson, 2002) to social media use, online political activism, virtual ethnography, and the ethical implications of data collection and artificial intelligence (Coleman, 2010; Miller, 2018).

As digital anthropology has grown and matured, there is an urgent need to systematically map its intellectual landscape. The growth of research publications, the emergence of new themes and international collaborations all point to the value of bibliometric analysis. This study employs bibliometric analysis using VOSviewer 1.6.20 to examine the field of digital anthropology as represented in the Scopus database. Data was extracted on July 15, 2024, using the search string “TITLE-ABS-KEY (Digital) AND TITLE-ABS-KEY (Anthropology)”, limited to English-language publications across all source types. By using bibliographic coupling, citation analysis, co-authorship analysis, and keyword co-occurrence analysis, this research tries to provide influential journals, key scholars, major research themes, and patterns of international collaboration.

This bibliometric study is timely for several reasons. Digital anthropology is continually expanding as digital technologies have become central to human life worldwide. New platforms, devices, and forms of digital interaction constantly emerge, requiring ongoing anthropological attention. The field faces some important question which are theoretical and ethical challenges. It ranges from appropriateness of methods for studying online communities, concerns about

surveillance, privacy, and the power of technology companies (Dalsgaard, 2016; Miller, 2018). Furthermore, as Howard and Mawyer (2015) note, digital technologies are transforming not only what anthropologists' study but also how they conduct and disseminate research. Understanding these methodological developments through bibliometric analysis can inform best practices and highlight innovative approaches. The findings can be beneficial for scholars new to digital anthropology, it provides key authors, and themes. For established researchers, it offers a systematic perspective on the field's development. For administrators and funding agencies, this study can demonstrate the intellectual vitality of digital anthropology research.

2. LITERATURE REVIEW

Digital anthropology has emerged as a critical field examining the intersection of human culture and digital technologies. As Horst and Miller (2012) try to explain, digital anthropology is not just studying technology, but it is how digital media has become part of our everyday life across diverse cultural contexts. The field has evolved significantly since its inception, moving from early studies of virtual communities and online interactions (Wilson & Peterson, 2002) to social media use, online political activism, virtual ethnography, and the ethical implications of data collection and artificial intelligence (Coleman, 2010; Miller, 2018). Miller et al. (2016) has done comparative research across nine countries on social media role in transforming social relationships. He found out that digital technologies do not produce uniform effects globally but are adapted and interpreted through local cultural frameworks.

The methodological landscape of digital anthropology has undergone a substantial transformation. Traditional ethnographic methods have been adapted for digital contexts, giving rise to what Pink et al. (2016) term "digital ethnography". Boellstorff et al. (2012) provide detailed guidance on conducting ethnographic research in virtual worlds. The relationship between the online and offline worlds has been a central concern, with Bluteau (2019) arguing that the distinction between these domains is increasingly blurred. This suggests anthropologists for building a new analytical framework that can capture relation between digital and physical spaces. Dalsgaard (2016) demonstrates how Facebook has become essential for maintaining long-term fieldwork relationships. Also raises important questions about authenticity, privacy, and the nature of ethnographic data.

Work and commerce have undergone significant transformation, as documented by Miller et al. (2016) in their examination of how social media affects entrepreneurship, job seeking, and workplace relationships across various cultural contexts. Venkatraman (2017) shows how social media has

fundamentally altered the boundaries between work and personal life in South India. Social relationships represent another crucial area, with Madianou and Miller (2012) they introduced the concept of "polymedia" to describe how people navigate multiple communication platforms. Visual communication has gained prominence with platforms like Instagram and Snapchat. Spyer (2017) examines how low-income Brazilians use visual content to distinguish between "lights on" public postings that display aspirational selves and "lights off" private exchanges that reveal more sensitive content. As Wang (2016) demonstrates, showing how rural-to-urban migrants in China utilise platforms like QQ and WeChat as primary spaces of social life, more significant than their physical workspace.

The rapid expansion and diversification of digital anthropology necessitate bibliometric analysis for several critical reasons. First, such an analysis can map intellectual networks, identifying key authors, influential publications, and collaborative relationships within the field, which becomes crucial as the discipline grows exponentially. Second, citation and co-authorship analysis can illuminate geographical patterns. This will help in knowing which regions are most active in digital anthropology research and how international collaborations are evolving. Third, bibliometric studies can assess the impact and influence of scholarly works. As Chayko (2017) notes, we live in an era of "super connectedness," where digital technologies constantly evolve. A discipline studying such dynamic phenomena requires equally dynamic tools for self-reflection and assessment. Moreover, as Miller (2018) argues, digital anthropology challenges us to reconsider fundamental questions about what it means to be human and how anthropology itself should adapt. Bibliometric analysis of Digital Anthropology in current scenario is not only useful but also essential.

3. METHODOLOGY

This study employs a comprehensive bibliometric analysis to systematically map the intellectual landscape of digital anthropology. The research design follows a systematic bibliometric approach utilising VOSviewer 1.6.20, a sophisticated software tool specifically designed for constructing and visualising bibliometric networks (Van Eck & Waltman, 2010). The analysis was conducted between June and July 2024, ensuring that the most recent publications available in the Scopus database were included in the study.

The Scopus database was selected as the primary data source for this study due to several compelling reasons. Data extraction was conducted on July 15, 2024, using a carefully constructed search query designed to capture relevant publications in digital anthropology. The search string employed was TITLE-ABS-KEY (Digital) AND TITLE-ABS-KEY (Anthropology)

3.1. Inclusion Criteria:

- Publications indexed in the Scopus database as of July 15, 2024
- All document types (journal articles, conference papers, book chapters, reviews)
- Publications containing both "Digital" and "Anthropology" in title, abstract, or keywords
- English-language publications
- All publication years available in the database

3.2. Exclusion Criteria:

- Publications not written in English (to ensure consistency in analysis and interpretation)
- Duplicate records
- Publications with incomplete metadata are essential for bibliometric analysis.

4. EXPLANATION & ANALYSIS

4.1. Bibliographic Coupling

Bibliographic Coupling provides a relationship between journals based on shared references to important journals. In our case as per VOS viewer image journals that are included is “Forensic Science International” (Cluster 2, 31 links, total link strength-2241 & Norm Citations – 103.36), “American Journal of Physical Anthropology” (Cluster 3, 29 links, total link strength 1065, Norm Citations 68.058), “Science” (Cluster 3, 2 links, total link strength 2, Norm Citations 60.012), “Journal Of Forensic Science” (Cluster 2, 32 links, total link strength 1020, Norm Citations 46.67). These are the most influential journals and represent interconnectedness within specific research fields. It has been arranged as per Norm Citation & depicted in VOS viewer image.

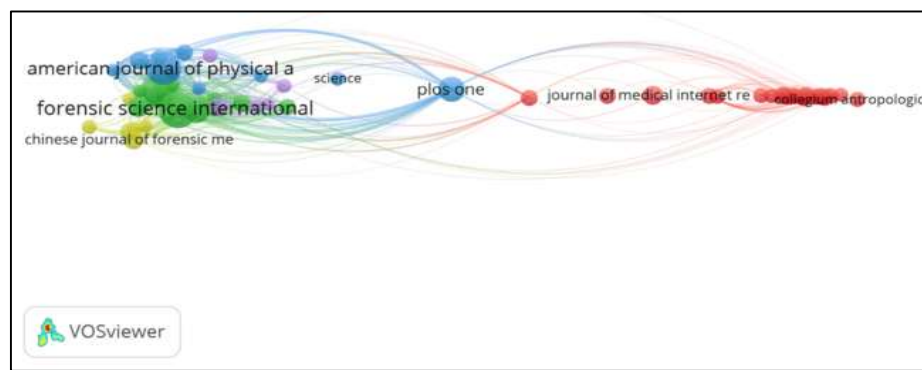


Figure 1: Bibliographic Coupling

4.2. Citation Analysis

Citation analysis examines the impact of research documents by counting the number of times they are cited. For the year 2022, the most cited document is "Lauria (2022)" with 22 citations. In 2021, "Profico (2021)" stands out with 25 citations. For the year 2020, the most cited document is "Sorrentino (2020)" with 27 citations. Finally, the document "Gunz (2009)" garnered notable attention in 2009, with a significant 354 citations. These documents highlight the most influential research in their respective years. Please refer to Table 2 (In the Table Appendix)

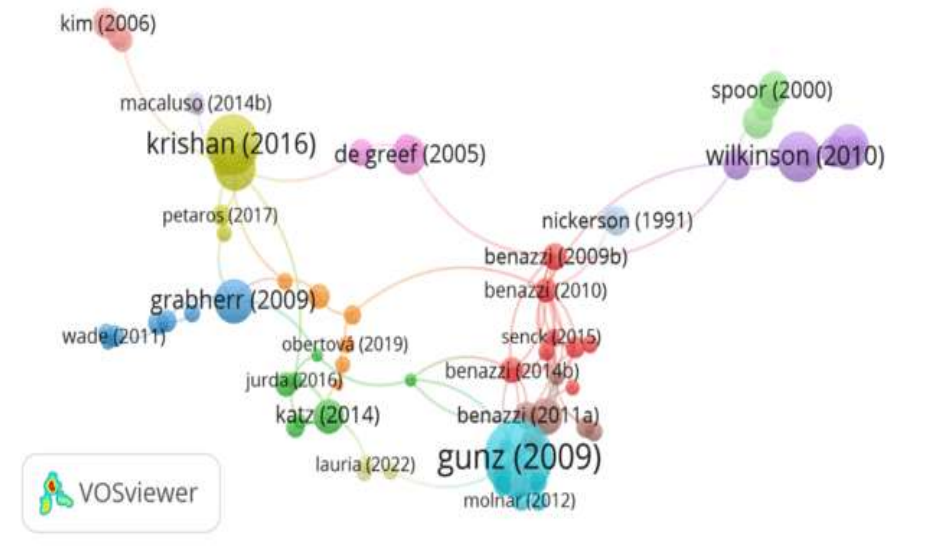


Figure 2: Citation Analysis

4.3. Co-Authorship Analysis

Co-authorship provides information on how researchers collaborate on articles. Key authors have been shortlisted based on their total link strength, as depicted in the VOS viewer image and clearly shown in Table 3. The link here signifies the number of collaborations with authors. Costantio Buzi collaborated with 9 authors and produced 8 documents, which garnered 94 citations. Similarly, Antonio Profico has collaborated with 9 authors, produced 9 documents and has 96 citations. In cluster 3 Stefano Benazzi has produced 16 documents by collaborating with 7 authors. This analysis highlights the collaborative efforts and impact of these researchers within their fields. For complete co-authorship, Table 3 has been placed in the Appendix.

4.4. Co Citation Analysis – Authorship

Co-citation analysis provides information on how frequently two authors are cited together, indicating their presence, influence, and interconnectedness in the research field. From the table below following inferences can be drawn

- (i) Cluster 1: S Pink with 358 co-citation links, with a total link strength of 16492, and has 460 citations; this author significantly shows influence in cluster 1.
- (ii) Cluster 2: M.Y. Iscan with 10,004 total link strength and 511 co-citation links.

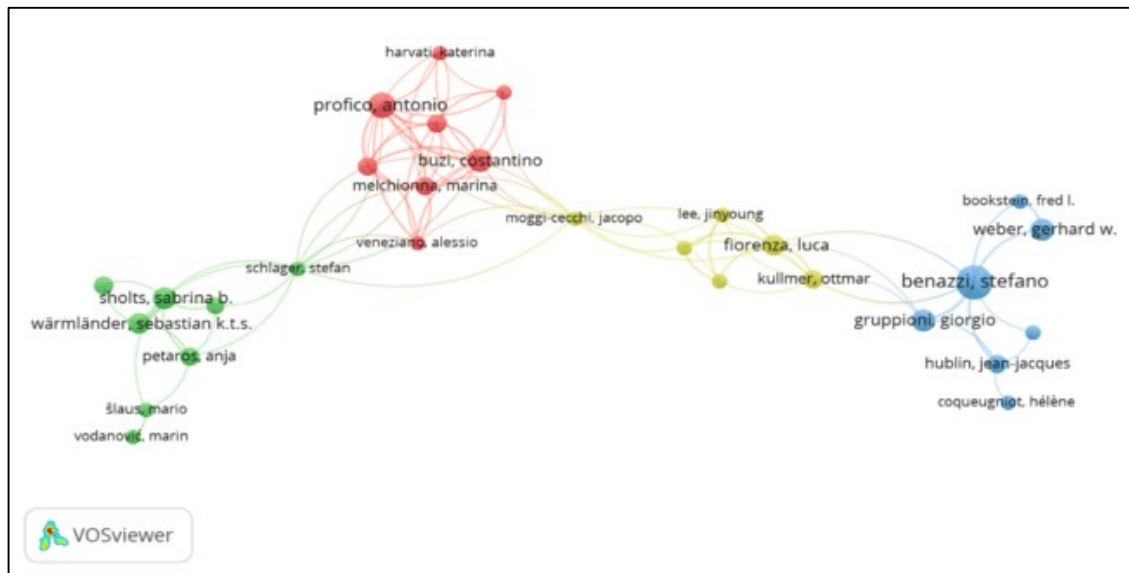


Figure 3: Co-Authorship

- (iii) Cluster 3: G.W Weber with 545 co-citation links with a total link strength of 26254 and 215 citations. It has the highest total link strength and exhibits a high level of influence, frequently cited in association with other works.

R Martin has the highest Co-citation link -571, followed by D.H. Ubelaker -547 & G.W. Weber -545

These metrics reveal the core authors and their connections within the research area, showcasing the foundational literature that shapes the field. Please refer to Table 4 (In the Table Appendix)

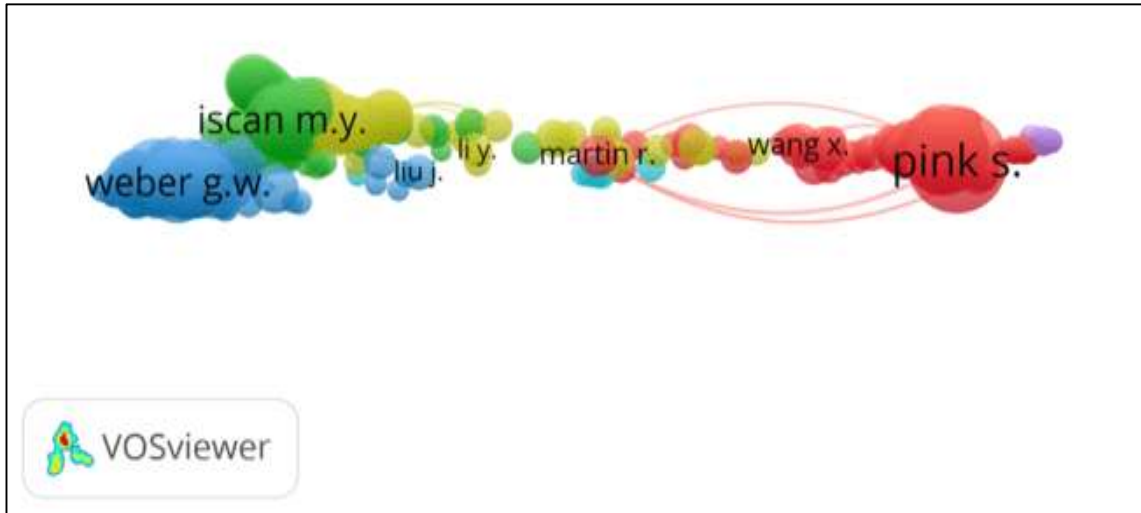


Figure 4: Co-Citation Cited Author

4.5. Co-Occurrence Author Keywords

Co-occurrence analysis of author keywords can reveal current trending research themes based on their frequent appearance together in recent papers. From the provided data, the trending research themes in each cluster are identified as follows: Please refer to Table 5 (In the Table Appendix)

Cluster 1:

Label	a*	b*	c*	d*	e*	f*	g*
Digital Anthropology	1	25	69	72	2019.97	19.54	1.38
Ethnography	1	26	73	66	2018.54	15.45	0.94
Social media	1	20	54	48	2019.6	29.12	2.22
Digital Ethnography	1	16	27	32	2019.21	8.37	0.80

*a-Cluster, b- Weight<links>, c-Weight<total link strength>, d-Weight

<occurrences>, e-Score<avg. Pub. Year>, f-Score<avg. Citations>, g-Score <avg. Norm. Citations>

Cluster 2:

Label	a*	b*	c*	d*	e*	f*	g*
Forensic Anthropology	2	29	208	198	2016.26	15.48	0.85
Forensic Science	2	21	76	56	2013.73	25.33	1.23
Forensic Anthropology Population Data	2	15	41	34	2014.35	38.91	1.84

Cluster 3

Label	a*	b*	c*	d*	e*	f*	g*
Anthropology	3	41	114	128	2018.14	10.70	0.88
Digital Humanities	3	12	18	24	2018.58	8.41	0.72
Photogrammetry	3	14	26	18	2020.66	6.27	0.73

Cluster 4

Label	a*	b*	c*	d*	e*	f*	g*
Virtual Anthropology	4	9	21	30	2017.3	21.93	1.41
Sexual Dimorphism	4	12	30	28	2018.42	10.14	1.03
Geometric Morphometrics	4	6	19	21	2014.81	39.33	1.62

Cluster 5

Label	a*	b*	c*	d*	e*	f*	g*
Visual Anthropology	5	11	21	25	2015.08	4.8	0.28
Gender	5	10	12	15	2018.13	30.86	1.48
Photography	5	9	15	13	2015.62	8.53	0.46

For overlay visualisation and year-wise occurrence, you need to use VOSViewer. Machine Learning and digitalisation are some of the keywords which have started appearing from 2021-22. Whereas forensic science and Geometric morphometrics were most commonly used in the 2012 period.

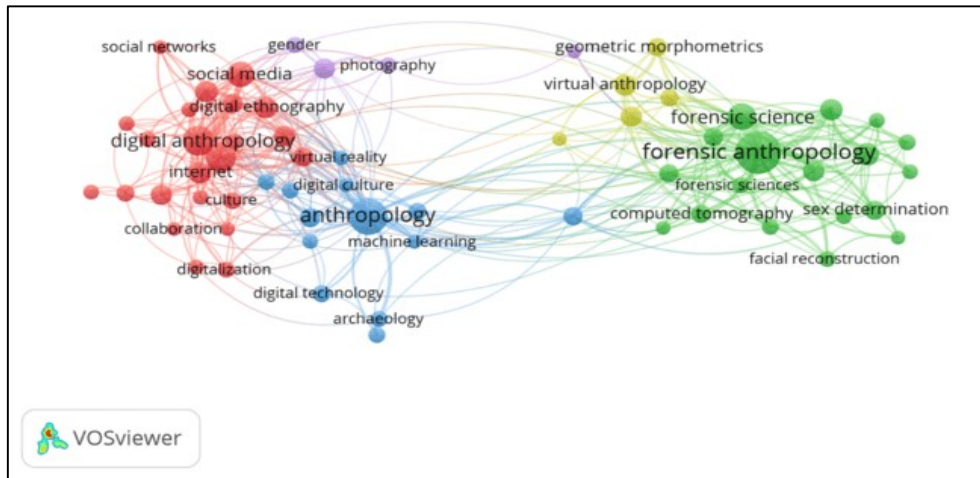


Figure 5: Co-Occurrence Author Keyword

4.6. Co-Authorship Country Mapping

- (i) The UK has collaborations with 51 countries, a total link strength of 290, and has produced 331
- (ii) The United States has collaborations with 50 countries, with a total link strength of 273 and produced 496.
- (iii) India has collaborated with 20 countries, a total link strength of 38, and produced 84 documents.

Please refer to Table 6 (In the Table Appendix)

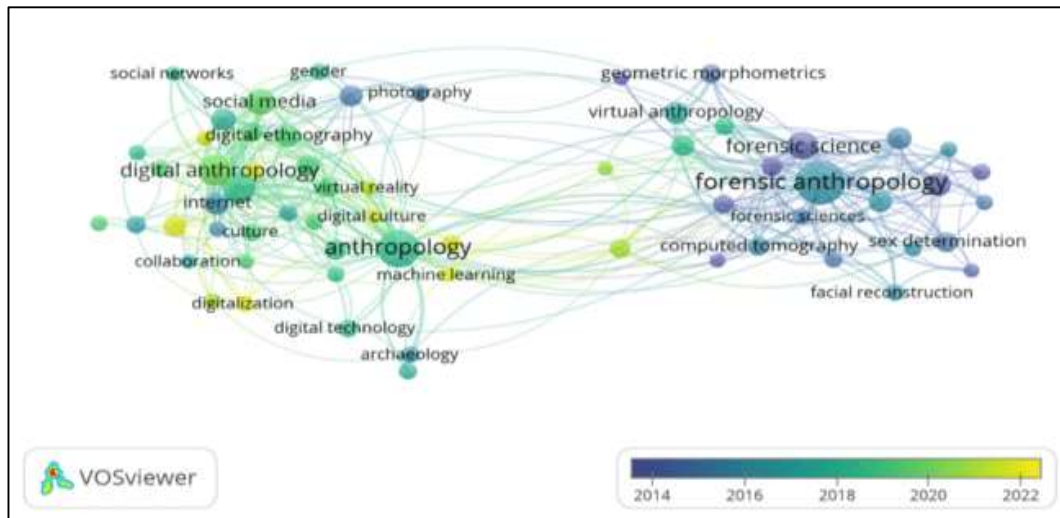


Figure 6: Co-Occurrence Author Keyword (Year Wise)

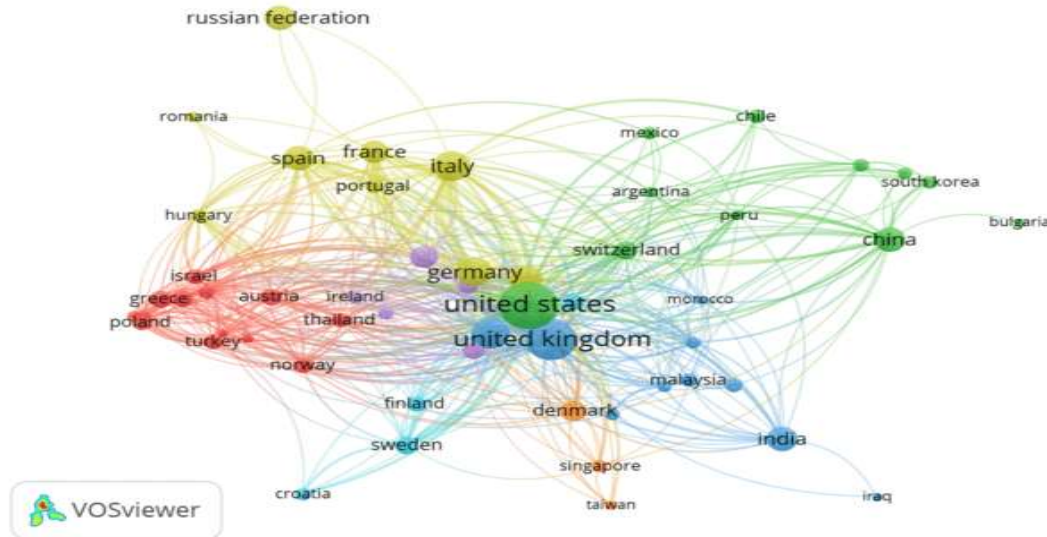


Figure 7: Country Mapping Co-Authorship

5. CONCLUSION

This bibliometric analysis offers a structured overview of digital anthropology as represented in the Scopus database up to July 2024. Using techniques like bibliographic coupling, citation analysis, co-authorship analysis, and keyword co-occurrence analysis, it maps the field's intellectual landscape. Findings indicate that digital anthropology draws from a range of publication venues, including both traditional anthropology outlets and interdisciplinary areas such as forensic science, medical anthropology, and media studies, highlighting its inherently interdisciplinary nature. Citation analysis identifies influential works by scholars like Gunz (2009) and Lauria (2022) that have shaped the field's growth. Patterns of co-authorship reveal extensive collaboration across institutions and countries, with key researchers forming active networks. The geographic distribution shows significant contributions from the UK, USA, and Italy, alongside emerging roles for India and other economies- India, for example, has contributed 84 documents and collaborates with 20 countries. Keyword co-occurrence analysis uncovers thematic clusters, from classic topics to newer areas like digital ethnography, social media, and online communities. Temporal trends demonstrate shifts from geometric morphometrics and virtual anthropology toward social media and digital ethnography, with keywords related to machine learning and digitalisation rising after 2021.

However, the study has limitations, as it only considers Scopus- Indexed publications and may overlook regional journals or non- English works. The

search string might have missed relevant publications not explicitly mentioning "digital" and "anthropology" in titles, abstracts, or keywords. Despite these issues, the research contributes valuable empirical insights into the growth and diversification of digital anthropology, mapping its intellectual structure. It highlights key journals and scholars and underscores the global scope, while also emphasising the need for more inclusive international research collaborations.

Notably, there is a lack of research from Africa, Latin America, and parts of Asia, despite these areas frequently serving as fieldwork sites. Additionally, there is scarce work focusing on artificial intelligence and big data.

In summary, digital anthropology has become a vibrant and influential discipline over the past twenty years. Its growth, global reach, and intellectual diversity are significant. As digital technologies continue transforming social life, anthropological research remains crucial. The field's holistic and ethnographic approach offers vital insights that complement other disciplines. By pursuing theoretically rigorous, methodologically innovative, and ethically sound research, digital anthropology can significantly advance scholarly understanding and public discussions about technology's role today. This bibliometric mapping provides a clearer picture of the current position of the field and potential future directions.

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APPENDIX**Table 1:**

S no	Journal	Cluster	Weight<links>	Weight <total link strength>	Weight <citations>	Weight <norm. Citations>	Score <avg. Pub. Year>
1	FORENSIC SCIENCE INTERNATIONAL	2	31	2241	2313	103.3591	2013.639
2	AMERICAN JOURNAL OF PHYSICAL ANTHROPOLOGY	3	29	1065	1298	68.0583	2011.225
3	SCIENCE	3	2	2	3051	60.0117	2012.333
4	JOURNAL OF FORENSIC SCIENCES	2	32	1020	1240	46.6864	2012.478
5	JOURNAL OF MEDICAL INTERNET RESEARCH	1	6	8	163	45.3801	2022.231
6	PLOS ONE	3	44	277	341	42.9783	2019.72
7	ANNUAL REVIEW OF ANTHROPOLOGY	1	19	315	493	31.2537	2017.333
8	INTERNATIONAL JOURNAL OF LEGAL MEDICINE	2	30	866	324	30.8125	2016.526
9	NEW MEDIA AND SOCIETY	1	19	238	266	24.608	2019.667
10	BIG DATA AND SOCIETY	1	19	140	193	24.3031	2021.375

Table 2: Citation Analysis arranged as per Year

S no	Label	Cluster	Weight <links>	Weight <citations>	Weight <norm. Citations>	Score <pub. Year>	Score <citations>	Score <norm. Citations>
1	LAURIA (2022)	13	3	22	5.7753	2022	22	5.7753
2	PROFICO (2021)	6	3	25	4.5656	2021	25	4.5656
3	OMARI (2021)	13	1	20	3.6525	2021	20	3.6525
4	SORRENTINO (2020)	8	3	27	3.009	2020	27	3.009
5	LUSSU (2020)	2	3	14	1.5602	2020	14	1.5602
6	JANI (2020)	1	2	17	1.8946	2020	17	1.8946
7	LEE (2020)	7	2	10	1.1145	2020	10	1.1145
8	VILLA (2019)	3	4	30	3.5225	2019	30	3.5225
9	PROFICO (2019B)	6	4	11	1.2916	2019	11	1.2916
10	JURDA (2019)	2	3	12	1.409	2019	12	1.409
11	PROFICO (2019A)	13	2	20	2.3483	2019	20	2.3483
12	OBERTO VÁ (2019)	7	2	19	2.2309	2019	19	2.2309
13	BROUGH (2019)	14	2	13	1.5264	2019	13	1.5264

14	BRUNER (2019)	6	1	25	2.9354	2019	25	2.9354
15	DERELI (2018)	4	3	18	1.236	2018	18	1.236
16	PROFICO (2018)	6	2	23	1.5793	2018	23	1.5793
17	BRASSEY (2018)	6	1	23	1.5793	2018	23	1.5793
18	HIRST (2018)	1	1	21	1.4419	2018	21	1.4419
19	ERRICKSON (2017)	7	3	25	1.3804	2017	25	1.3804
20	URBANOVÁ (2017)	7	3	19	1.0491	2017	19	1.0491
21	PETAROS (2017)	4	2	26	1.4356	2017	26	1.4356
22	JURDA (2016)	2	5	20	1.2477	2016	20	1.2477
23	GARVIN (2016)	9	2	46	2.8696	2016	46	2.8696
24	KRISHAN (2016)	4	1	218	13.5995	2016	218	13.6
25	DENG (2016)	5	1	30	1.8715	2016	30	1.8715
26	BAIER (2016)	2	1	27	1.6843	2016	27	1.6843
27	BULUT (2016)	4	1	23	1.4348	2016	23	1.4348
28	SENCK (2015)	1	7	20	0.7143	2015	20	0.7143
29	OGIHARA (2015)	2	4	11	0.3929	2015	11	0.3929
30	WEBERE (2015)	8	3	83	2.9643	2015	83	2.9643
31	JAYAPRAKASH (2015)	12	3	26	0.9286	2015	26	0.9286
32	LORKIEWICZ-MUSZYŃSKA (2015)	7	2	19	0.6786	2015	19	0.6786
33	LINDSAY (2015)	5	2	10	0.3571	2015	10	0.3571
34	BEAINI (2015)	2	1	36	1.2857	2015	36	1.2857
35	KLEIN (2015)	4	1	20	0.7143	2015	20	0.7143
36	LÓPEZ-ALCARAZ (2015)	3	1	15	0.5357	2015	15	0.5357
37	BENAZZI (2014B)	1	9	41	1.5463	2014	41	1.5463
38	KATZ (2014)	2	4	72	2.7154	2014	72	2.7154
39	WEBER (2014)	8	2	38	1.4331	2014	38	1.4331
40	MACALUSO (2014B)	14	1	31	1.1691	2014	31	1.1691
41	SENCK (2013)	8	10	18	0.873	2013	18	0.873
42	SFORZA (2013B)	5	2	64	3.1041	2013	64	3.1041
43	DE FROIDMONT (2013)	3	2	21	1.0185	2013	21	1.0185
44	LUO (2013)	4	1	33	1.6006	2013	33	1.6006
45	SFORZA (2013A)	5	1	24	1.1641	2013	24	1.1641
46	FERNANDES (2013)	9	1	18	0.873	2013	18	0.873
47	ZHENG (2012)	10	3	39	1.95	2012	39	1.95
48	FERNANDES (2012)	9	1	34	1.7	2012	34	1.7
49	MOLNAR (2012)	6	1	24	1.2	2012	24	1.2
50	BENAZZI (2011A)	8	9	44	0.7413	2011	44	0.7413
51	BENAZZI (2011B)	1	6	21	0.3538	2011	21	0.3538
52	WADE (2011)	3	3	30	0.5055	2011	30	0.5055
53	MACALUSO JR. (2011)	10	1	23	0.3875	2011	23	0.3875
54	RAMSTHALER (2010)	4	11	134	3.8604	2010	134	3.8604
55	BENAZZI (2010)	1	10	39	1.1235	2010	39	1.1235
56	WILKINSON (2010)	5	4	152	4.3789	2010	152	4.3789

57	CLAES (2010)	5	2	127	3.6587	2010	127	3.6587
58	HARTH (2010)	3	1	35	1.0083	2010	35	1.0083
59	GUNZ (2009)	6	17	354	9.773	2009	354	9.773
60	BENAZZI (2009D)	1	8	30	0.8282	2009	30	0.8282
61	BENAZZI (2009B)	1	7	46	1.2699	2009	46	1.2699
62	GRABHERR (2009)	3	5	118	3.2577	2009	118	3.2577
63	SANSONI (2009)	7	2	36	0.9939	2009	36	0.9939
64	BENAZZI (2009A)	8	1	23	0.635	2009	23	0.635
65	YU (2008)	10	1	40	2.7888	2008	40	2.7888
66	BRUNER (2007)	11	1	59	3.7133	2007	59	3.7133
67	KIM (2006)	10	2	56	1.2928	2006	56	1.2928
68	DE GREEF (2005)	9	4	94	1.9184	2005	94	1.9184
69	GHOSH (2005)	12	1	13	0.2653	2005	13	0.2653
70	CESARANI (2004)	5	5	56	0.685	2004	56	0.685
71	WEBER (2001)	11	2	55	4.0066	2001	55	4.0066
72	SPOOR (2000)	11	2	72	1.1538	2000	72	1.1538
73	ZUR NEDDEN (1994)	11	2	70	2.1212	1994	70	2.1212
74	MACCHIARELLI (1994)	3	1	22	0.6667	1994	22	0.6667
75	NICKERSON (1991)	12	1	53	1.8596	1991	53	1.8596

Table 3: CO AUTHORSHIP ANALYSIS- ARRANGED AS PER TLS

S no	Label	Cluster	Weight <links>	Weight <total Link Strength>	Weight <document>	Weight <citation>	Weight <norm. citation>	Score <avg. Pub. Year>	Score <avg. Citations>	Score <avg. Norm. Citations>
1	BUZI, COSTANTINO	1	9	32	8	94	12.9384	2020.25	11.75	1.6173
2	PROFICO, ANTONIO	1	9	32	9	96	13.3036	2020.333	10.6667	1.4782
3	MELCHIONNA, MARINA	1	9	25	5	68	9.0801	2020	13.6	1.816
4	RAIA, PASQUALE	1	9	25	5	68	9.0801	2020	13.6	1.816
5	MANZI, GIORGIO	1	9	23	5	64	6.6895	2019.4	12.8	1.3379
6	BENAZZI, STEFANO	3	7	22	16	501	19.9344	2012.688	31.3125	1.2459
7	FIorenza, LUCA	4	7	17	6	75	3.0055	2016.167	12.5	0.5009
8	VENEZIANO, ALESSIO	1	7	16	3	59	7.4364	2019.333	19.6667	2.4788
9	MOGGI-CECCHI, JACOPO	4	13	13	3	29	2.399	2020	9.6667	0.7997
10	KULLMER, OTTMAR	4	7	12	5	127	5.7684	2014.2	25.4	1.1537
11	SHOLTS, SABRINA B.	2	6	12	7	249	10.1541	2014.714	35.5714	1.4506

1										
2	FUNG, SARAH	4	5	11	3	9	1.287 7	2020. 667	3	0.429 2
1										
3	GRUPPIONI, GIORGIO	3	4	11	7	268	8.537 2	2010. 571	38.28 57	1.219 6
1										
4	KAIDONIS, JOHN	4	5	11	3	9	1.287 7	2020. 667	3	0.429 2
1										
5	LEE, JINYOUNG	4	5	11	3	9	1.287 7	2020. 667	3	0.429 2
1										
6	SCHLAGER, STEFAN	2	11	11	3	50	3.132 3	2018	16.66 67	1.044 1
1										
7	WÄRMLÄNDER, SEBASTIAN K.T.S.	2	5	11	6	265	10.38 17	2013	44.16 67	1.730 3
1										
8	DI VINCENZO, FABIO	1	7	10	3	26	3.523 9	2020. 667	8.666 7	1.174 6
1										
9	HARVATI, KATERINA	1	6	8	3	12	2.570 4	2021	4	0.856 8
2										
0	HUBLIN, JEAN- JACQUES	3	4	8	5	166	6.835 4	2014. 2	33.2	1.367 1
2										
1	PETAROS, ANJA	2	5	7	5	56	4.016 1	2015. 6	11.2	0.803 2
2										
2	GARVIN, HEATHER M.	2	4	6	4	125	6.955 2	2017	31.25	1.738 8
2										
3	WEBER, GERHARD W.	3	2	6	7	536	17.79 14	2011. 143	76.57 14	2.541 6
2										
4	BOOKSTEIN, FRED L.	3	2	5	3	418	11.22 86	2011. 667	139.3 333	3.742 9
2										
5	ALAU, MARIO	2	3	4	3	12	1.525 1	2018. 667	4	0.508 4
2										
6	KUZMINSKY, SUSAN C.	2	2	2	5	211	10.22 73	2015. 4	42.2	2.045 5
2										
7	PINHASI, RON	3	2	2	3	22	1.450 1	2016. 333	7.333 3	0.483 4
2										
8	VODANOVI, MARIN	2	1	2	3	25	1.379 3	2015. 667	8.333 3	0.459 8
2										
9	COQUEUGNIOT, HÉLÈNE	3	1	1	3	95	3.735 7	2014	31.66 67	1.245 2

Table 4: CO CITATION ANALYSIS – AUTHORSHIP

S no	Label	Cluster	Weight <links >	Weight <total link strength>	Weight <citations >
1	MARTIN R.	1	571	2892	48
2	UBELAKER D.H.	2	547	5998	122
3	WEBER G.W.	3	545	26254	215
4	BOOKSTEIN F.L.	3	545	21696	194
5	LYNNERUP N.	2	544	6084	75
6	BENAZZI S.	3	517	19327	186
7	ISCAN M.Y.	2	511	10004	206
8	GRUPPIONI G.	3	507	7087	79
9	O'HIGGINS P.	3	501	8856	85
10	BRAUN M.	2	497	3908	45

11	FRIESS M.	2	492	3900	50
12	BUIKSTRA J.E.	2	488	2764	60
13	CATTANEO C.	2	485	7636	130
14	GUNZ P.	3	473	16622	150
15	THALI M.J.	2	470	9685	100
16	MITTEROECKER P.	3	459	7965	93
17	RAMSTHALER F.	2	452	5638	91
18	CUNHA E.	2	450	5512	93
19	SLICE D.E.	3	448	6523	60
20	ROSS S.	2	441	3102	31
21	FRANKLIN D.	2	440	6407	115
22	WALKER P.L.	2	437	3916	76
23	WHITE T.D.	3	436	2494	38
24	JANTZ R.L.	2	432	5764	102
25	BRUZEK J.	2	430	3766	54
26	KRANIOTI E.F.	2	430	3375	56
27	STEYN M.	2	428	4330	92
28	RICHTSMEIER J.T.	3	428	3553	37
29	VELEMINSKA J.	2	421	1933	24
30	PONCE DE LEON M.S.	3	420	5894	65
31	GUYOMARC'H P.	4	420	3208	41
32	GARVIN H.M.	2	417	4110	60
33	ROHLF F.J.	3	416	5627	61
34	ROSS A.H.	2	415	2951	45
35	ROSAS A.	3	413	4129	38
36	SEIDLER H.	3	412	10026	78
37	HENNEBERG M.	4	412	3394	61
38	RUFF C.B.	3	411	4091	73
39	OXNARD C.E.	2	408	2374	28
40	SANTOS F.	4	406	1874	26
41	SHOLTS S.B.	2	405	4756	74
42	HARVATI K.	3	403	5088	62
43	OUSLEY S.D.	2	402	2300	38
44	WANG X.	1	402	2067	59
45	HUBLIN J.J.	3	401	11346	82
46	BRUNER E.	3	400	6587	72
47	CARDINI A.	2	400	2411	40
48	KULLMER O.	3	399	12843	110
49	ROSS A.	2	397	1431	25
50	VERHOFF M.A.	2	396	3621	67

Table 5: Co-Occurrence Author Keywords

S no	Label	Cluster	Weight <links>	Weight <Total link strength>	Weight <Occurrences>	Score <Avg. pub. year>	score<Avg. citation s>	Score <Avg. norm. citation s>
1	FORENSIC ANTHROPOLOGY	2	29	208	198	2016.263	15.4899	0.8542
2	ANTHROPOLOGY	3	41	114	128	2018.148	10.7031	0.8845
3	DIGITAL ANTHROPOLOGY	1	25	69	72	2019.972	19.5417	1.3825
4	ETHNOGRAPHY	1	26	73	66	2018.546	15.4545	0.9494
5	FORENSIC SCIENCE	2	21	76	56	2013.732	25.3393	1.2389
6	SOCIAL MEDIA	1	20	54	48	2019.604	29.125	2.2233
7	FORENSIC ANTHROPOLOGY POPULATION DATA	2	15	41	34	2014.353	38.9118	1.8481
8	DIGITAL ETHNOGRAPHY	1	16	27	32	2019.219	8.375	0.8046
9	INTERNET	1	20	50	31	2015.839	18.0323	0.7897
10	DIGITAL MEDIA	1	14	28	30	2017.567	14.0667	0.9981
11	AGE ESTIMATION	2	13	43	30	2015.5	19.3	0.8683
12	VIRTUAL ANTHROPOLOGY	4	9	21	30	2017.333	21.9333	1.4126
13	SEXUAL DIMORPHISM	4	12	30	28	2018.429	10.1429	1.0264
14	FORENSIC DENTISTRY	2	10	36	28	2016.5	11.2857	0.8966
15	COVID-19	1	12	18	26	2021.5	19.2308	3.1392
16	DIGITAL	1	17	33	25	2019	7.68	0.9234
17	VISUAL ANTHROPOLOGY	5	11	21	25	2015.08	4.8	0.2821
18	ETHICS	1	15	24	24	2019.375	4.4583	0.495
19	TECHNOLOGY	1	12	19	24	2019.125	7.875	1.0728
20	DIGITAL HUMANITIES	3	12	18	24	2018.583	8.4167	0.7239
21	SEX DETERMINATION	2	9	24	23	2014.913	18.9565	0.9345
22	HUMAN IDENTIFICATION	2	16	38	21	2013.81	20.0952	1.0636
23	COMPUTED TOMOGRAPHY	2	16	31	21	2015.905	25.1429	0.9779
24	GEOMETRIC MORPHOMETRICS	4	6	19	21	2014.81	39.3333	1.6139
25	IDENTIFICATION	2	15	29	19	2014.474	14.7368	0.6442

26	PHOTOGRAMMETRY	3	14	26	18	2020.6 67	6.2778	0.7326
27	CULTURE	1	12	16	17	2019	20.8824	1.6757
28	DIGITAL TECHNOLOGY	3	8	11	17	2018.5 29	4.6471	0.6485
29	SEX ESTIMATION	4	9	27	16	2018.3 13	18.5	1.4882
30	ARTIFICIAL INTELLIGENCE	3	8	13	16	2021.4 38	7.5	2.8504
31	DIGITAL TECHNOLOGIES	1	8	9	16	2016.8 13	14.375	1.594
32	BIG DATA	3	12	14	15	2019.2	34.4667	2.3235
33	GENDER	5	10	12	15	2018.1 33	30.8667	1.4812
34	DIGITAL HEALTH	1	5	5	15	2021.6 67	23.1333	2.4072
35	FORENSIC SCIENCES	2	13	26	14	2014.9 29	29.9286	1.8925
36	SKULL	2	13	23	14	2015	12	1.0048
37	DIGITALIZATION	1	8	13	14	2022.2 86	1.2143	0.3567
38	METHODOLOGY	3	13	21	13	2017.0 77	7.2308	0.6125
39	FORENSIC ODONTOLOGY	2	9	16	13	2013.6 15	17.5385	0.955
40	PHOTOGRAPHY	5	9	15	13	2015.6 15	8.5385	0.4621
41	MEDIA	1	8	11	13	2019.3 85	8.1538	0.4457
42	FACIAL RECONSTRUCTION	2	7	14	13	2016.1 54	18.1538	1.3063
43	ARCHAEOLOGY	3	5	15	13	2016.4 62	6.3077	0.3457
44	CULTURAL HERITAGE	3	4	9	13	2017.5 39	2.5385	0.3049
45	ANTHROPOMETRY	2	9	20	12	2016.5 83	10	0.6753
46	CHINA	1	9	13	12	2021.2 5	4.9167	0.9192
47	VIRTUAL REALITY	3	9	11	12	2020.9 17	3.9167	0.3189
48	STATURE ESTIMATION	2	7	18	12	2016.0 83	21.75	1.1301
49	DESIGN ANTHROPOLOGY	1	3	3	12	2019.1 67	5.25	0.5159
50	HISTORY	1	8	10	11	2015.5 46	4.3636	0.3244

TABLE 6: COUNTRIES

S no	Label	Cluster	Weight <links >	Weight <total link Strength>	Weight <Documents>	Weight < Citations >	Weight <norm. Citation s>	Score <avg. Pub. Year>	Score <avg. Citations >	Score <avg. Norm. Citations >
1	UNITED KINGDOM	3	51	290	331	6126	515.9258	2018.136	18.5076	1.5587
2	UNITED STATES	2	50	273	496	11485	636.5775	2015.688	23.1552	1.2834
3	ITALY	4	34	148	135	2967	184.7716	2016.407	21.9778	1.3687
4	AUSTRALIA	3	42	141	135	2721	264.194	2018.133	20.1556	1.957
5	GERMANY	4	30	140	126	2107	132.5439	2017.016	16.7222	1.0519
6	CANADA	4	35	118	101	2060	146.416	2016.337	20.396	1.4497
7	SPAIN	4	30	82	86	849	82.4645	2018.454	9.8721	0.9589
8	NETHERLANDS	5	29	81	39	653	77.1667	2019.026	16.7436	1.9786
9	FRANCE	4	25	71	68	1517	74.1767	2017.574	22.3088	1.0908
10	SWITZERLAND	2	31	66	38	675	64.8957	2018.211	17.7632	1.7078
11	AUSTRIA	1	28	57	32	1183	58.3883	2015.094	36.9688	1.8246
12	CHINA	2	27	57	81	762	79.5514	2017.975	9.4074	0.9821
13	SWEDEN	6	20	49	36	758	50.9775	2016.667	21.0556	1.416
14	DENMARK	7	24	47	46	803	83.4544	2019.174	17.4565	1.8142
15	BELGIUM	6	26	46	22	715	35.8137	2016.091	32.5	1.6279
16	SOUTH AFRICA	5	28	43	24	711	57.2679	2018.583	29.625	2.3862
17	NORWAY	1	27	42	22	130	16.8183	2017.409	5.9091	0.7645
18	HUNGARY	4	26	42	15	210	27.9624	2019.667	14	1.8642
19	ISRAEL	1	25	40	21	621	62.2456	2014.571	29.5714	2.9641
20	GREECE	1	23	40	33	349	20.7095	2016.727	10.5758	0.6276
21	INDIA	3	20	38	84	1098	91.0921	2018.429	13.0714	1.0844
22	THAILAND	1	29	34	18	314	27.3721	2020.222	17.4444	1.5207
23	HONG KONG	3	18	32	12	369	31.667	2020.667	30.75	2.6389
24	TURKEY	1	24	30	22	245	21.0017	2016.955	11.1364	0.9546
25	IRELAND	5	21	30	14	165	21.0706	2016.786	11.7857	1.505