

How Digital Marketing Research Trends Over Time: A Bibliometric Analysis on Scopus Database

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ABSTRACT

The digital era has revolutionized marketing practices, particularly through social media and mobile platforms, profoundly impacting consumer behavior and business strategies. Extensive research underscores the pivotal role of digital marketing in fostering customer relationships and driving business growth. Based on the gathered metadata, bibliometric analysis evaluates the effectiveness of scientific publications. This study investigates the following topics: (1) the total number of articles published by year; (2) the journal in which the author published the article; (3) the affiliation of the researcher who published the article; (4) the nation in which the researcher published the article; and (5) the researcher's field of study. Data in the form of scientific publications written in the English language were gathered between 2003 and 2024 from the Scopus database using the keyword "digital marketing." Vosviewer is used to visualize the publication development mapping image, and tables and graphs make up the presentation.

INTRODUCTION

Digital marketing conducted through social media and mobile devices has changed the daily lives of millions of people. Such marketing activities have resulted in customer relationships that have evolved into popular social media practices (Fujita et al., 2017; Han et al., 2016; Kim, 2018; Woodside & Bernal Mir, 2019). Digital marketing is also predicted to remain at the forefront of future technological transitions as it offers new opportunities to reach, inform and engage customers and provide and sell goods and services (Ko, 2019; Lamberton & Stephen, 2016). By using digital platforms such as social media and smartphones, digital marketing can respond to changes in consumer behaviour wherever they are (Tiago & Veríssimo, 2014). In terms of effectiveness, all departments within an organisation are affected by digital marketing, from customer feedback, customer service, product improvement, sales, finance and payment, and administration to marketing or delivery (Chaffey & Smith, 2013).

Digital marketing uses digital technology to create integrated, targeted, and measurable communication patterns that are expected to help acquire and retain customers in the long term (Kannan & Li, 2017; Mort & Drennan, 2002; Petit et al., 2019). Social media has become a new means of marketing a business, creating new opportunities and obstacles (Arora & Sanni, 2018; Dwivedi et al., 2015; Hossain et al., 2019). Marketers know that social media such as Instagram, Facebook, YouTube, Snapchat, and Pinterest have advantages in marketing a business, so they dare to invest heavily in social network advertising. In today's digital era, consumers use smartphones to find information about the products they seek. The trend of using the Internet to find information and social networking is increasing. Internet users in 1995 were only around 16 million; in 2019, the number jumped to 4536 million or 58.6% of the world population. Now, in 2024, the percentage of internet users is already higher than in previous years (Busca & Bertrandias, 2020). Each person is estimated to spend an average of 6 hours and 42 minutes using the Internet (Mandal, 2017). The Internet is essential for all aspects of human life, such as social life, personal communication, education, and health. It has developed into one of the most significant markets for selling goods and services (Leefflang et al., 2014). These technological inventions have greatly influenced how consumers and marketers interact with customers. Facebook entered the market in 2004, and many other social networking sites followed suit in the following years. How people interact and communicate is influenced by how society receives these social media (Faruk et al., 2021). In addition, the cost of digital technology also contributes to reducing the cost of marketing activities (Goldfarb & Tucker, 2019).

This study aims to contribute to the development of research in the field of digital marketing through a systematic and objective literature review. Bibliometric research provides a complete picture of digital marketing, especially in academic and literature studies (Şenbabaoğlu Danaci, 2023). The use of bibliometric analysis is widely used for marketing literature studies, some of which are bibliometric analysis for international marketing (Samiee &

Chabowski, 2011), industry 4.0 (Cobo et al., 2018), and entrepreneurship research (Ferreira et al., 2017).

LITERATURE REVIEW

Currently, digital media is the most effective marketing channel for communicating the products sold by companies (Şenbabaoğlu Danacı, 2023). It is essential to most marketing campaigns (Key, 2017) (Chaffey & Ellis, 2019). Technology and innovation have significantly changed marketing channels in recent years. The opinion (Key, 2017) explains that significant changes in marketing channels can be obtained through digital transformation. Marketers' approach to consumers has become more efficient, effective, and persuasive with digital technology.

The concept of digital marketing was introduced in the 1990s and expanded its use when new social applications and mobile technology emerged (Fierro et al., 2024). The AMA defines *digital marketing* as the use of digital tools in order to reach consumers or promote a product that can be done through the Internet, social media, mobile devices, and other devices. By using social media as a means to communicate with customers, it will create more effective customer relationships (Kim et al., 2021). Digital devices may not play a role in creating a product. However, various activities such as research, personalisation, purchasing or post-purchase communication are included in activities that can be done through mobile applications (Key, 2017).

Marketing has undergone a significant transformation in education and industry as digital marketing evolves with technological advancements (Lamberton & Stephen, 2016). Marketers should concentrate on relationship-based interactions with their customers to improve their digital marketing strategies. Digital marketing through social media and mobile devices is quickly becoming part of millions of people's daily lives, forming successful customer relationships and extending to general activities on social media (Kim et al., 2021). (Kannan & Li, 2017) investigated how advances in digital technology are changing marketing processes and strategies and the impact of these changes in the "digital marketing" field. The research (Kannan & Li, 2017) emphasises how important it is for businesses today to build "digital relationships" with customers.

METHODOLOGY

This research uses the Scopus database to find the needed literature because it has the most comprehensive data sources. Scopus has more publications and citations (Zhu & Liu, 2020; Pranckutė, 2021). Moreover, it is a database that is often used for bibliometric analysis (Firmansyah & Faisal, 2020) and is the most complete database compared to other databases (Falagas et al, 2008) and better than the WOS database (Brezinski, 2015). In this study, several steps are shown in the figure below, from determining the topic until the data needed for bibliometric analysis is obtained.

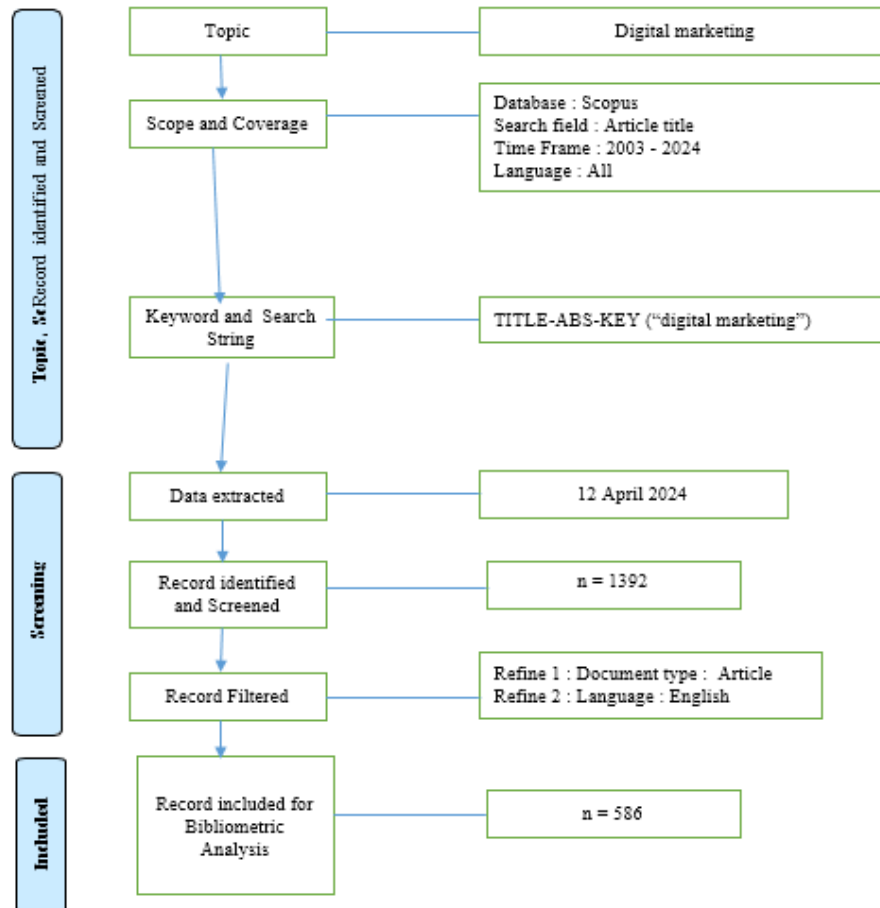


Figure 1. PRISMA Diagram

Figure 1 is adopted from the PRISMA diagram (Page et al., 2021). The first step is data collection using data sources from the Scopus database, which was retrieved on 12 April 2024. The search term used is "digital marketing", based on the title only when searching. The filter used is the type of document in the form of research articles and uses English in terms of language. From the results of pulling article metadata from the Scopus database, 586 bibliographic data were obtained, which were then processed using Microsoft Excel, ScientoPy, Vosviewer (Van Eck & Waltman, 2021) and Bibliometrics (Aria & Cuccurullo, 2017). The bibliometric indicators displayed in this study include:

1. The number of articles is based on the category of the year the article was published.
2. Journal articles based on the category of the publishing journal
3. Number of articles based on the author category
4. Number of articles based on the category of researcher affiliation
5. Number of articles based on country category
6. Number of articles based on the category of field of study
7. Mapping based on the relationship between words visualised using Vosviewer software.

The following section will present the results of the data analysis and a discussion on digital marketing using bibliometric analysis.

RESULT AND DISCUSSION

Article searches conducted using the Scopus database through the Prisma method resulted in article findings of 586 documents. The topic studied is related to digital marketing using a time frame from 2003 to 2024, which was accessed on 12 April 2024. Researchers used digital marketing keywords and only set the article's title in the search process, so the number of documents obtained was 1392 items. Then, the researcher continued the filter process by only including documents in research articles and using English, so the results obtained were 586 articles. The following will be reviewed about the development of digital marketing based on the year category. This journal publishes the article's author, the author's affiliation, the country, and the author's field of study.

Table 1. Development of Article Publication by Year

No.	Year	Documents	MeanTCperArt	MeanTCperYear
1	2024	66	1.39	1.39
2	2023	122	2.52	1.26
3	2022	113	9.4	3.13
4	2021	78	18.29	4.57
5	2020	68	14.38	2.88
6	2019	54	17.44	2.91
7	2018	23	14.48	2.07
8	2017	16	56.62	7.08
9	2016	10	17.3	1.92
10	2015	7	73.14	7.31
11	2014	8	59.88	5.44
12	2013	4	14	1.17
13	2012	3	78	6.00
14	2011	3	97.67	6.98
15	2010	6	4.17	0.28
16	2009	1	13	0.81
17	2008	1	1	0.06
18	2007	0	-	
19	2006	1	2	0.11
20	2005	1	4	0.20
21	2004	0	-	
22	2003	1	80	3.64

Source: Data processing results in 2024

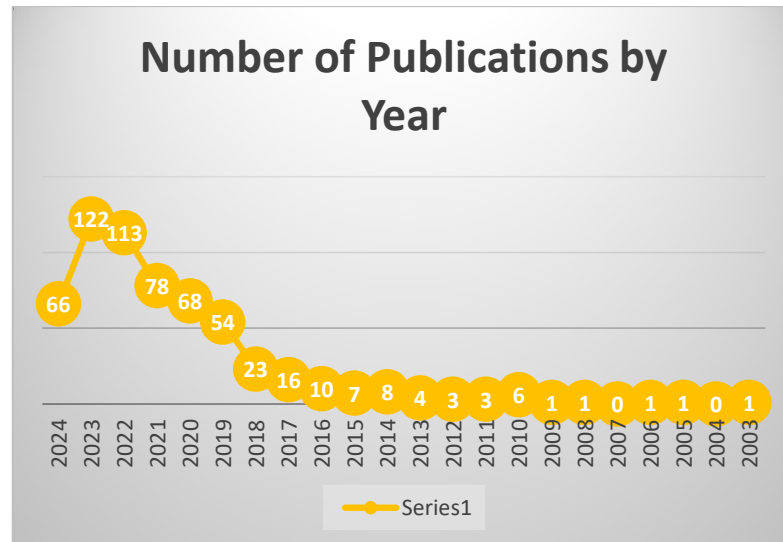


Figure 2. Development of article publications by year

Based on Table 1 and Figure 2, research on digital marketing has experienced an upward trend from 2015 to 2023. Starting in 2015, which only produced seven articles, there was always an increase in article publications in the following years. The highest number of publications occurred in 2023, namely 122 articles. When viewed from the increase in articles each year, the highest number of increases by percentage was from 2018 to 2019, which was 135% (increasing from 23 articles to 54 articles). The number of publications in 2024 of 66 articles cannot be considered a downward trend because this research was carried out in the current year. The increase in the number of articles each year shows that research on digital marketing is really in demand by many researchers. Research in the form of articles titled Digital Marketing and Using English has existed since 2003. At that time, there was only one article published with the title "Assessing customer perceptions of website service quality in digital marketing environments", written by (Wang & Tang, 2003) and published by the Journal of End User Computing. Although the journal was published first, it does not mean it is at the top of the list for the highest number of citations. The journal written by (Wang & Tang, 2003) only received 80 citations. The highest number of citations was published in 2017, with the article titled "Digital Marketing: A Framework, review and research agenda" written by (Kannan & Li, 2017) receiving 635 citations. In second place is an article published in 2014 titled "Digital marketing and social media: Why bother?" and written by (Tiago & Veríssimo, 2014) with 325 citations.

For the average number of citations per article from 2003 - 2024, the highest gain was in 2011, with a value of 97.69, which indicates that each article published in 2011 received an average of 97.69 citations. In 2021, the average number of citations per article was 18.29; in 2022, it was 9.4. The average value is lower than in 2011 because the number of articles published in 2021 and 2022 has increased significantly. The number of citations in 2021 was 1427 with 78 articles; in 2022, there were 1062 citations with 113 articles. Based on the table above, the highest average value of citations per year was obtained in 2015 with

a value of 7.31, which means that articles published in 2015 had an average number of citations of 7.31 each year.

Journals that publish articles with the title Digital Marketing

When conducting a literature review, it is essential to know which journals to read to publish research and the focus of each journal related to the title Digital marketing. The following table shows the top twenty most published digital marketing articles in journals.

Table 2. Journals that publish digital marketing articles

No.	Source	Paper	H-Index	G-Index	TC	Start
1	International Journal Of Data And Network Science	32	11	20	421	2021
2	Computer Aided Design And Applications	19	1	1	3	2024
3	Sustainability Switzerland	15	8	15	313	2019
4	Journal Of Digital And Social Media Marketing	11	2	4	17	2018
5	International Journal Of Advanced Science And Technology	9	2	4	20	2020
6	Journal Of Marketing Education	8	5	8	244	2011
7	Journal Of Theoretical And Applied Information Technology	8	2	5	25	2019
8	Quality Access To Success	8	2	2	6	2019
9	Applied Marketing Analytics	6	2	4	16	2019
10	Financial And Credit Activity Problems Of Theory And Practice	6	1	1	3	2022
11	International Journal Of Recent Technology And Engineering	6	2	3	12	2019
12	Journal Of Marketing Analytics	6	2	6	45	2014
13	Marketing Education Review	6	4	6	54	2018
14	Uncertain Supply Chain Management	6	3	6	38	2021

15	Industrial Marketing Management	5	5	5	468	2015
16	International Journal Of Scientific And Technology Research	5	2	3	12	2019
17	Journal Of Advanced Research In Dynamical And Control Systems	5	1	1	5	2019
18	Journal Of Direct Data And Digital Marketing Practice	5	4	5	5	2010
19	Transnational Marketing Journal	5	2	3	5	2021
20	Cogent Business And Management	4	3	4	16	2022

Source: Data processing results in 2024

Based on the table and graph above, it can be seen that the journal that published the most articles with the title Digital Marketing from 2003 to 2024 is the International Journal of Data and Network Science, with a total publication of 32 articles. This journal is included in the Q2 category with SJR 0.42 based on the search results through the website www.scimagojr.com. This journal is in first place for the number of article publications. It has been a journal that has consistently published articles with digital marketing titles since 2021, including 2021 (2 articles), 2022 (15 articles), 2023 (8 articles) and 2024 (7 articles). The article from the journal titled "The Effect of Digital Marketing Capabilities on Organisational Ambidexterity of the Information Technology Sector" (Tariq et al., 2022) contributed the most to the acquisition of citations, namely 107 citations.

The second journal with the top number of article publications is Computer Aided Design and Applications, which has 19 documents, all of which were published in 2024 with a minimal number of citations (3 citations). The journal "Industrial Marketing Management" achieved the highest number of citations, with 468 citations from 5 articles published since 2015. The article entitled "The Use of Web Analytics for Digital Marketing Performance Measurement", written by (Järvinen & Karjaluoto, 2015) received 193 citations, then in second place was an article entitled "The Digital Marketing Capabilities Gap" written by (Herhausen et al., 2020) with 119 citations.

Authors who conduct Digital Marketing Research

Between 2003 and 2024, the number of authors who published articles titled "digital marketing", according to the search results from the Scopus database, is 1653 authors. Researchers made a list of authors in the top order for the number of articles produced (at least 3). The following table and graph present the list of authors, the number of article publications, and the total citations obtained.

Table 3. Authors who publish about Digital Marketing

Author	Documents	sitasi	C/P
Sharma, A.	5	79	15,8
Alshurideh, M.	4	223	55,8
Karjaluoato, H.	4	429	107,3
Sakas, D.P.	4	50	12,5
Saura, J.R.	4	367	91,8
Nuseir, M.T.	4	56	14,0
Sharma, S.	4	84	21,0
Akour, I.	3	208	69,3
Almansour, M.	3	30	10,0
Barquera, S.	3	29	9,7
Daoud, M.K.	3	2	0,7
Eze, S.C.	3	34	11,3
Key, T.M.	3	132	44,0
Munir, A.R.	3	18	6,0
Terzi, M.C.	3	33	11,0
Tolentino-Mayo, L.	3	29	9,7

Source: Data processing results in 2024

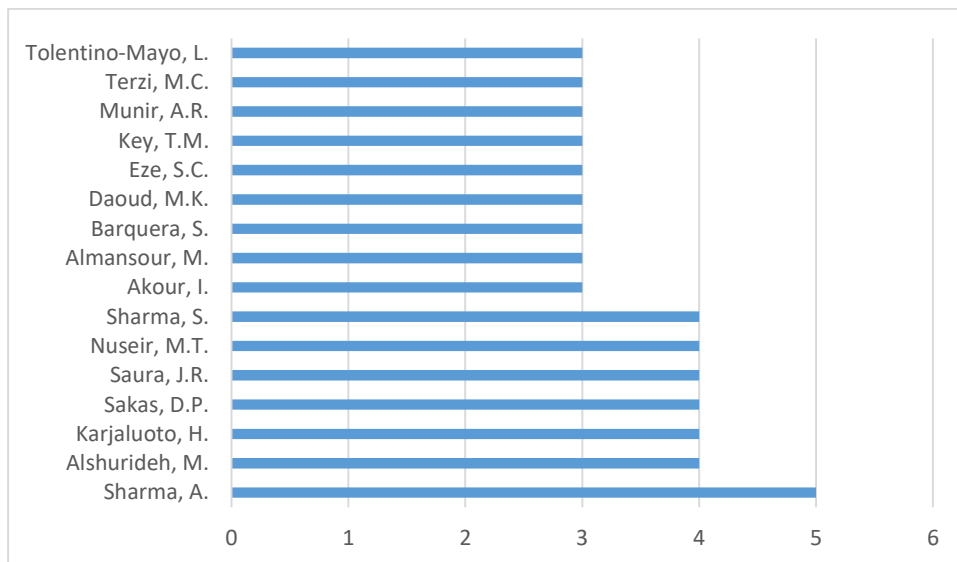


Figure 3. Authors who publish about digital marketing

Based on the information obtained from Table 3 and Figure 3 above, it can be explained that the author of the article with the highest number is Sharma, A, with a total of 5 articles. In the following order are Al Shurideh, Karjaluoato, Sakas, Saura, Nuseir and Sharma, S, who already have four research publications. Next in line are Akour and Tolentino, who have three articles each. Although Sharma is at the top of the list for the number of article

publications, the acquisition of sites is not at the top. Based on the results of the article search, Sharma's work was published in 2020 (1 article), 2023 (3 articles) and 2024 (1 article) with a total of 79 citations. The work (Sharma et al., 2020) that contributed significantly to the acquisition of the number of citations was an article published in 2020 titled "Are Small Travel Agencies Ready For Digital Marketing? Views Of Travel Agency Managers" with 74 citations. The author at the top of the list for citations is Karjaluoto, who has 429 citations. Karjaluoto has four articles published in 2009 (1 article), 2010 (1 article), and 2015 (2 articles). Karjaluoto's most cited article is entitled "The Usage Of Digital Marketing Channels In SMES", with 208 citations, and an article entitled "The Use Of Web Analytics For Digital Marketing Performance Measurement", with 193 citations, published in 2015. In general, the highest citation value per publication is 107.3, obtained by the author named Karjaluoto; following in the following order is Saura, with a value of 91.8 and Akour, with a value of 69.3. Of the 16 authors included in the list of authors of the most articles, only two authors whose articles are included in the category of 10 articles with the most citations, namely on behalf of Karjaluoto and Saura. The following will present a table containing the ten articles ranked by the highest number of citations from 2003 to 2024

Table 4. List of the ten most cited articles

No.	Authors	Title	Year	Source title	Cited by
1	(Kannan & Li, 2017)	Digital marketing: A framework, review and research agenda	2017	International Journal of Research in Marketing	635
2	(Tiago & Veríssimo, 2014)	Digital marketing and social media: Why bother?	2014	Business Horizons	325
3	(Taiminen & Karjaluoto, 2015)	The usage of digital marketing channels in SMEs	2015	Journal of Small Business and Enterprise Development	208
4	(Saura, 2021)	Using Data Sciences in Digital Marketing: Framework, methods, and performance metrics	2021	Journal of Innovation and Knowledge	202
5	(Järvinen & Karjaluoto, 2015)	The use of Web analytics for digital marketing performance measurement	2015	Industrial Marketing Management	193

6	(De Pelsmacker et al., 2018)	Digital marketing strategies, online reviews and hotel performance	2018	International Journal of Hospitality Management	185
7	(Smith, 2011)	Digital marketing strategies that Millennials find appealing, motivating, or just annoying	2011	Journal of Strategic Marketing	151
8	(Taken Smith, 2012).	Longitudinal study of digital marketing strategies targeting Millennials	2012	Journal of Consumer Marketing	143
9	(Royle & Laing, 2014)	The digital marketing skills gap: Developing a Digital Marketer Model for the communication industries	2014	International Journal of Information Management	133
10	(Herhausen et al., 2020).	The digital marketing capabilities gap	2020	Industrial Marketing Management	119

Source: Data processing results in 2024

Table 4 above shows that the article "Digital marketing: A framework, review and research agenda" gets the highest number of citations, 635. The article was written by (Kannan and Li, 2017) and published by the International Journal of Research in Marketing in 2017. In the following order is the article titled "Digital marketing and social media: Why bother?" written by (Tiago & Veríssimo, 2014) and published by Business Horizons with 325 citations. The article "The Usage of Digital Marketing Channels in SMEs" was written by (Karjalainen, 2015), published in the Journal of Small Business and Enterprise Development, and received 208 citations.

Affiliation of Researchers Whose Research is About Digital Marketing

Based on the results of researchers' searches through the Scopus database from 2003 to 2024, information was obtained that the number of affiliated authors who produced articles on digital marketing was 160 affiliates. After the data filtering process was carried out by only including affiliates whose number of publications was at least five articles, as many as 13 affiliates were included in the table. The following is a table containing 13 affiliates who produce article publications with the title Digital marketing.

Table 5. Affiliations of Digital Marketing Researchers

No.	Affiliation	Documents
1	Bina Nusantara University (Indonesia)	19
2	The University of Jordan (Yordania)	8
3	Amity University (India)	7
4	Al Ain University (UEA)	7
5	School of Business University of Jordan (Yordania)	7
6	Universidad Rey Juan Carlos (Spanyol)	6
7	Applied Science Private University (Yordania)	6
8	University of Sharjah (UEA)	6
9	Middle East University, Jordan (Yordania)	6
10	Universitat Politècnica de València (Spanyol)	5
11	Al-Ahliyya Amman University (Yordania)	5
12	Hasanuddin University (Indonesia)	5
13	Jaypee Institute of Information Technology (India)	5

Source: Data processing results in 2024

Based on Table 5 above, it can be seen that the affiliate with the highest number of article publications is Bina Nusantara University, with a total publication of 18 articles. Bina Nusantara University (Jakarta, Indonesia) began contributing to articles on digital marketing in 2017 with the article titled "Examining the Relationship between Transformational Leadership and Dynamic Capability to the Adoption of Digital Marketing in Consumer Shopping Good Firms" written by (Abi & Arief, 2017) published by the International Journal of Economics and Management. The authors of articles from Bina Nusantara University in the following years are also very productive in writing articles about digital marketing, namely in 2019 (1 article), 2020 (3 articles), 2021 (7 articles), 2022 (4 articles) and in 2023 (3 articles). Next in line are the University of Jordan (Amman, Jordan) with eight articles, Amity University (Noida, India) with seven articles, Al Ain University (Al Ain United Arab Emirates) and the School of Business University of Jordan (Amman, Jordan) with seven articles.

Countries Where Researchers Write About Digital Marketing

Based on the information obtained from the Scopus database search results, it can be seen that the number of countries contribute to producing articles entitled digital marketing is 85 countries. Researchers then filtered data by only entering affiliates who had produced at least five digital marketing articles into the table. The following is a table containing information about the affiliates, along with the number of articles produced.

India has the highest number of published articles (89 articles). India's contribution to producing research on digital marketing started from 2015 to 2024, including publishing in 2015 (3 articles), 2016 (3 articles), 2017 (4 articles), 2018 (6 articles), 2019 (10 articles), 2020 (22 articles), 2021 (9 articles), 2022 (8

articles), 2023 (17 articles) and entering 2024 has produced seven articles. In second place is Indonesia, with 76 articles published (from 2017 to 2024). The United States is in third place with 64 articles published since 2010 until now.

Table 6. Number of articles by country

No.	Country/Territory	Documents	Total Sitasi	Average Article Citations
1	India	89	369	7,50
2	Indonesia	75	270	5,40
3	United States	64	1543	40,60
4	China	48	167	4.00
5	United Kingdom	44	426	21,30
6	Jordan	24	308	17.10
7	Malaysia	21	40	3.30
8	Saudi Arabia	20	29	2.40
9	Spain	18	290	22.30
10	Australia	17	185	15.40
11	United Arab Emirates	17	46	15.30
12	Ukraine	16	102	8.50
13	Portugal	15	52	5.80
14	Pakistan	12	37	5.30
15	Thailand	12	119	13.20
16	Brazil	10	115	14.40

Source: Data processing results in 2024

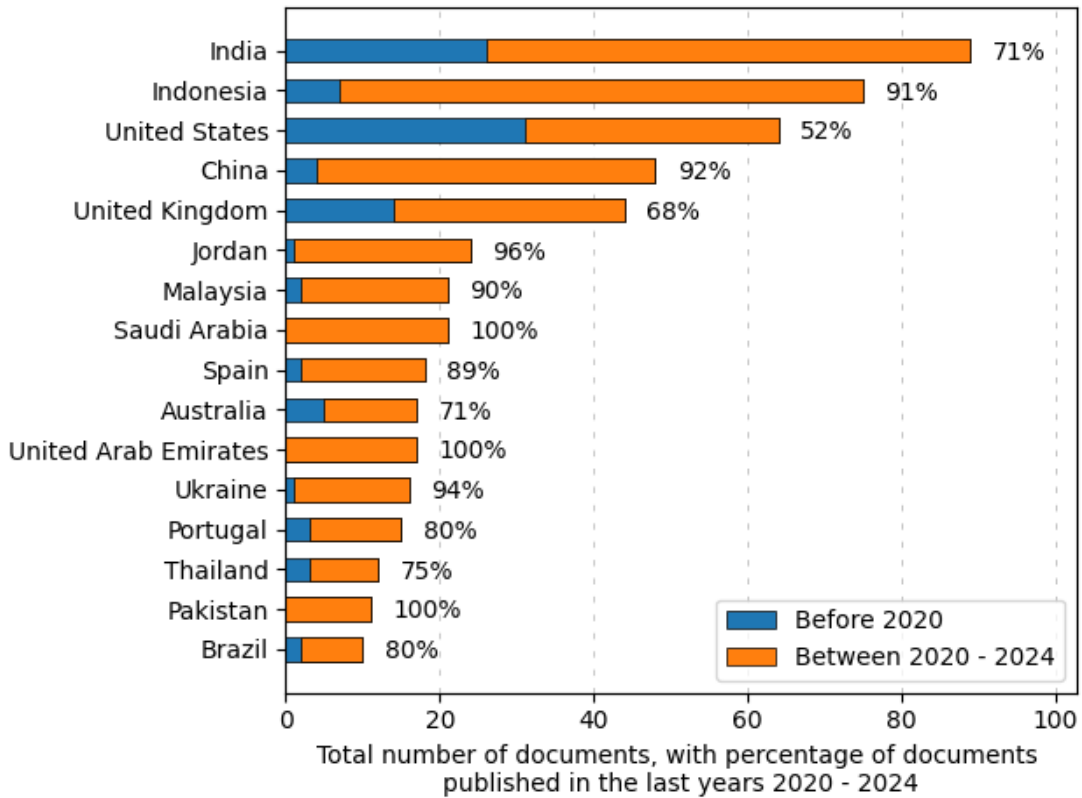


Figure 4. Percentage of documents published in 2020-2024

Table 6 shows the percentage of articles published in 2020 to 2024. Most countries in the table list produced many research articles titled Digital Marketing in 2020-2024. The country of India researches digital marketing. About 71% was produced from 2020 to 2024, while the remaining 29% was produced before 2020. Next is Indonesia, where 91% of research articles were created from 2020 to 2024, while the remaining 9% were created before 2020. The percentage of articles produced by the United States before 2020 was 48%, while from 2020 to 2024, it was 52%. The United States gets the highest number of citations for digital marketing research because many articles were produced before 2020. If traced back through the metadata that has been obtained, the United States has published articles with the title digital marketing since 2010. There are a total of 31 articles published before 2020, and the highest number of citations was obtained by the United States in 2017, with 635 citations. Several articles published in 2011-2012 also gained relatively high citations, including those from the works of (Smith, 2011) with 151 citations, (Wymbs, 2011) with 117 citations and (Taken Smith, 2012) with 143 citations.

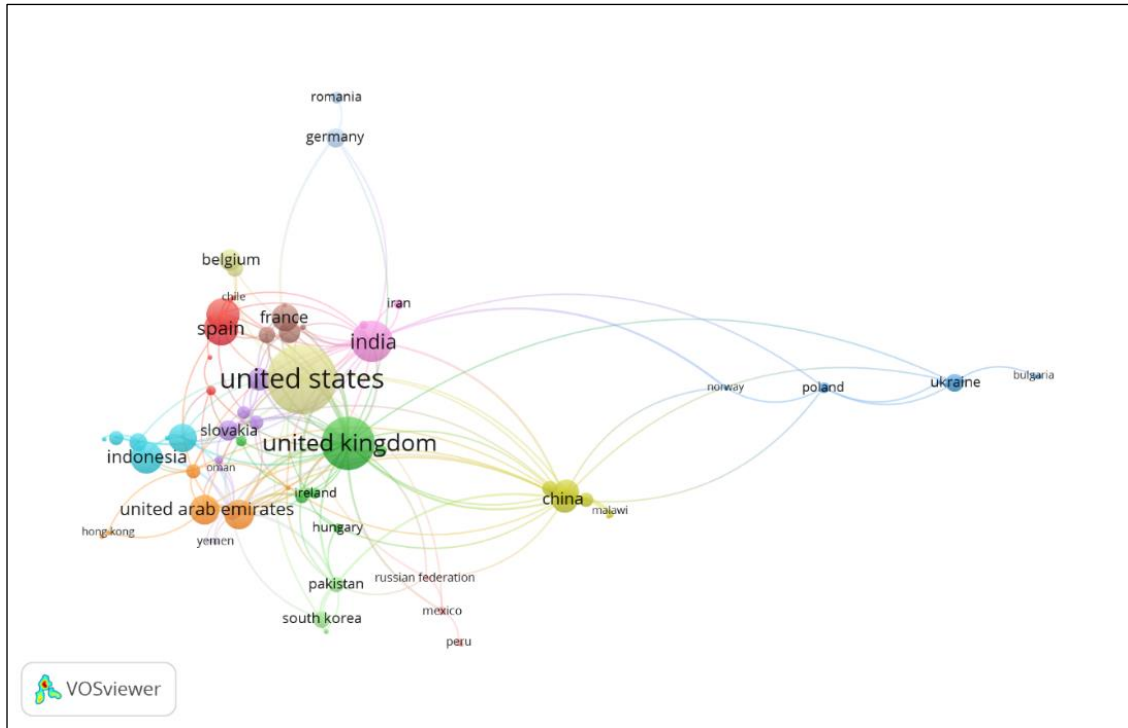


Figure 5. Collaboration between countries for joint article writing

The figure 5 above shows that each country collaborates with other countries to write articles together. For example, the United States collaborates with several countries, including India, China, South Korea, Brazil, and the United Kingdom. The size of the United States node looks more extensive than other countries' nodes. These results show that the United States has the highest number of citations compared to the total citations obtained by other countries. The United States is in first place with 1543 citations and an average article citation of 40.60. Meanwhile, in the first place, for the number of article publications, India only collected 369 citations, with an average article citation of 7.5. This value shows that articles produced by researchers from the United States have the most significant impact factor because the number of citations produced is very high.

Number of Articles Based on Number of Subject Areas

The results of researchers' searches of metadata obtained through the Scopus database show that there are 24 subject areas whose research uses the title digital marketing. The table below only includes ten subject areas ranked based on the most article publications.

Table 7. Number of Articles by Field of Study

No.	subject area	Documents
1	Business, Management and Accounting	285
2	Social Sciences	206
3	Computer Science	187

4	Engineering	108
5	Economics, Econometrics and Finance	78
6	Decision Sciences	55
7	Mathematics	43
8	Environmental Science	35
9	Medicine	30
10	Energy	28

Source: Data processing results in 2024

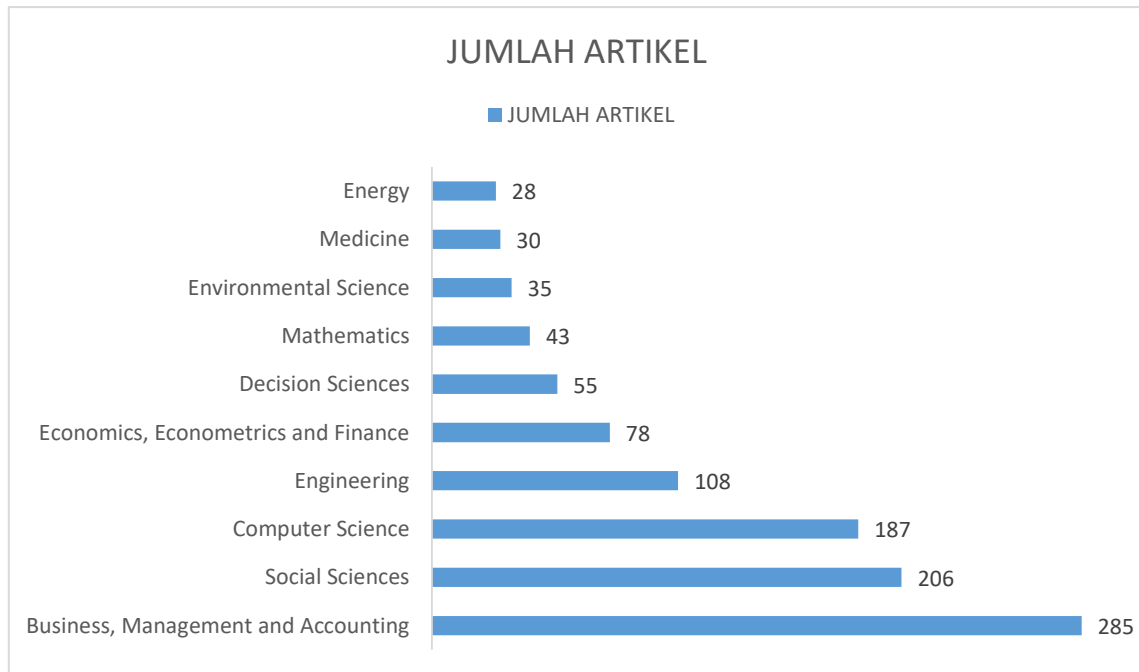


Figure 6. Number of articles based on field of study

Based on Table 7 and Figure 6 above, it can be explained that the field of study that produces the most articles with the title digital marketing is business, management and accounting, with a total publication of 285 articles. The following order is a social science, with 206 articles; in third place is computer science, with 187 articles. In general, many fields of study that take research topics on digital marketing include fields whose relevance to research topics could be much higher. Some of them are immunology and microbiology (1 article), dentistry (1 article), and physics and astronomy (2 articles), which have very few publications. In contrast, the business, management, and accounting fields are very suitable and relevant to digital marketing, so the output of articles is enormous.

Mapping Based on Relationship Between Words (Co-occurrence)

The next step is to conduct bibliometric analysis using Vosviewer, a top-rated program that can display visualisations in network, overlay and density formats. According to (Zupic and Čater, 2015), bibliometric mapping is a landscape representation showing science topics. It is related to articles in

metadata downloaded to the Scopus database. The bibliometric network takes the form of edges and nodes, as seen in the image visualised by Vosviewer. Connections that link network nodes are called edges. Building relationships between articles and collaboration between authors is the function of edges in bibliometric research. According to (Aribowo, 2019), edges are also used to measure the strength of the relationship between nodes represented by distance. The relationship between nodes becomes more potent the closer the distance is. Nodes can be research articles, publications, researchers, or keywords researchers use in their publications. The bibliometric analysis also uses the term "cluster" to group different research articles to provide a complete and detailed picture of the research.

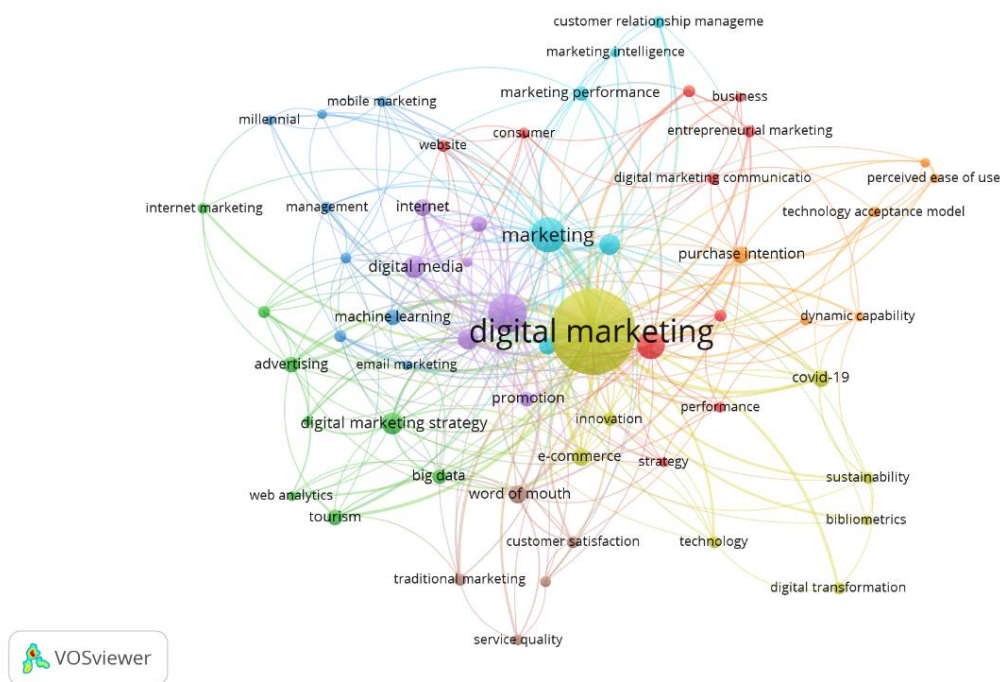


Figure 7. Mapping and Clustering of articles on Digital Marketing

Figure 7 above shows that the 586 articles using the word "digital marketing" as a research title can be divided into eight clusters, each depicted by the colour of the circle and its connecting lines. The results of each cluster are organised in the following table based on frequently used keywords, including

Table 8. Clustering Based on Frequently Appearing Keywords

Cluster	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Keywords that appear frequent	<ul style="list-style-type: none"> • business • consumer • digital marketing communication 	<ul style="list-style-type: none"> • advertising • big data • content marketing 	<ul style="list-style-type: none"> • consumer behavior • email marketing • instagram 	<ul style="list-style-type: none"> • bibliometrics • covid-19 • digital marketing

ly	<ul style="list-style-type: none"> • digital technology • entrepreneurial marketing • entrepreneurship • performance • smes • strategy • website 	<ul style="list-style-type: none"> • digital marketing strategy • internet marketing • marketing communications • tourism • web analytics 	<ul style="list-style-type: none"> • machine learning • management • millennial • mobile marketing • social networks 	<ul style="list-style-type: none"> • digital transformation • e-commerce • innovation • sustainability • technology
	Cluster 5	Cluster 6	Cluster 7	Cluster 8
	<ul style="list-style-type: none"> • digital media • food marketing • internet • online marketing • promotion • search engine optimization • social media 	<ul style="list-style-type: none"> • artificial intelligence • customer relationship management • digitalization • marketing intelligence • marketing performance 	<ul style="list-style-type: none"> • dynamic capability • marketing effectiveness • perceived ease of use • perceived usefulness • purchase intention • technology acceptance model 	<ul style="list-style-type: none"> • customer satisfaction • service quality • supply chain management • traditional marketing • word of mouth

Source: Data processing results in 2024

The first cluster (dark red) relates to digital entrepreneurship and SME strategy because in this cluster, there are several terms, such as business, consumer, digital marketing communication, digital technology, entrepreneurial marketing, entrepreneurship, performance, SMES, strategy, and website. This cluster focuses on integrating digital technology in business and marketing strategies, especially for entrepreneurs and SMEs. The second cluster (green) deals with digital marketing in tourism. This cluster has several terms: big data, content marketing, digital marketing strategy, internet marketing, marketing communications, tourism, and web analytics. The second cluster shows effective strategies and tools for promoting a product by focusing on technology and its application in the tourism industry.

The third cluster in colour (blue) relates to millennial engagement through digital marketing because, in this cluster, there are several terms such as consumer behaviour, email marketing, Instagram, machine learning,

management, millennials, mobile marketing and social networks. The fourth cluster (dark yellow) relates to digital transformation and innovation in the era of Covid 19 because it contains terms such as bibliometric, COVID-19-, 19 digital marketing, digital transformation, e-commerce, innovation, sustainability and technology.

The fifth cluster (purple) is related to digital marketing in the food industry because the terms used include digital media, food marketing, and Internet to social media. Cluster 6 (cyan) relates to digital marketing and customer intelligence because, in this cluster, there are several terms, such as artificial intelligence, customer relationship management, digitalisation, marketing, marketing intelligence, and marketing performance.

Cluster 7 (orange) relates to technology adoption and marketing impact because there are several terms, such as dynamic capability, marketing effectiveness, and technology acceptance model. Meanwhile, cluster 8 (brown) relates to Customer Experience and Business Operations because it contains terms such as customer satisfaction, service quality, supply chain management, traditional marketing, and word of mouth.

The next step is mapping and clustering based on an article's publication year (Aribowo, 2019). The results of the overlay visualisation (output from the Vosviewer software) can be used to determine a study's state of the art. The colour of the visualised nodes illustrates the year of research publication according to the keywords used. The darker the colour of the nodes, the longer the keywords have been used in research. Conversely, the lighter the colour of the nodes, the more recent the keywords used in the research. The following will present an overlay visualisation image of 586 articles that use the word digital marketing in the article title.

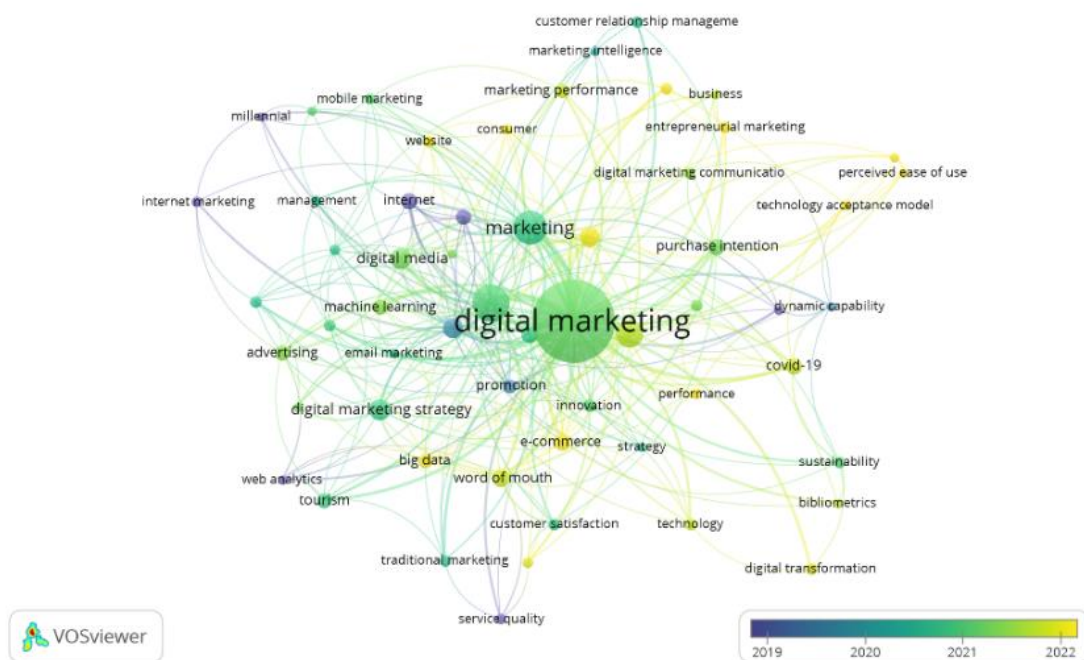


Figure 8. Visualisation of Overlay of Articles on Digital Marketing

Figure 8 above shows that keywords like Internet, online marketing, millennial, web analytics and service quality have long been used in digital marketing research. The length of research on the use of keywords is reflected in the colour of the nodes, which appears darker than the colour of other nodes. The internet keyword has a relationship with other keywords such as digital media, online marketing, innovation, and marketing communication, and these interconnected keywords appear together in a study. Although keyword web analytics has been used in research for a long time, it is still relevant for relatively new research. Based on the relationship between web analytics nodes and light-coloured nodes, such as big data and word of mouth. The use of web analytics keywords has been around since 2015, based on the work made by (Järvinen and Karjaluoto, 2015) in the article "The Use of Web Analytics for Digital Marketing Performance Measurement". Research that includes web analytics and prominent data keywords includes an article entitled "Multichannel Digital Marketing Optimizations through Big Data Analytics in the Tourism and Hospitality Industry" written by (Sakas et al., 2022) 2022. Some keywords in 2022 and above are artificial intelligence, entrepreneurship, perceived ease of use, technology acceptance model, big data, and performance. Research on digital marketing also involves the COVID-19 keyword, which includes a bright colour for the colour of the nodes that surround it. The COVID-19 keyword appears in the current year (2020-2024), and 25 articles use this keyword. Keywords that fall into the trending category are keywords that, on average, have a high citation rate, have a significant impact on scientific literature, and appear in the current year, such as entrepreneurial marketing and word-of-mouth.



Figure 9. Visualisation of Density of Articles on Digital Marketing

Figure 9 relates to whether or not the article is frequently researched and can be identified by the node's colour. If the colour surrounding the nodes is bright (yellow), then there is a high density and concentration of research on these keywords. Based on the density visualisation image, it can be seen that only the digital marketing keyword is coloured yellow, while the others are still dark green. Keywords other than digital marketing can still be explored again by future researchers and provide a gap for future researchers to find newness in research.

CONCLUSION AND DISCUSSION

This study aims to map research on digital marketing obtained from the Scopus database using the keyword and search string "Digital Marketing" – the time frame for article searches from 2003 to 2024. The most articles published in 2022 were 122 articles; the author with the most is Sharma, who has five articles. The field of study with the highest number of articles is Business, Management and Accounting, with 285 articles. For mapping and visualisation of articles, use vosviewer with co-occurrence analysis type, and the unit of analysis is the author keyword. The results are network visualisation, overlay visualisation, and density visualisation. Based on the relationship between words, the keyword grouping is obtained as many as 8 clusters.

FURTHER RESEARCH

This research uses the Scopus database to obtain research metadata on digital marketing. For further research, it is recommended to use other databases to get more diverse results, such as WOS (Web of Science) or dimension. This research only focuses on titles that use the word "digital marketing" so that future researchers can use a combination of abstracts, article titles and keywords in searching various research documents related to digital marketing so that metadata is obtained that covers a broader scope and more in number.

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