



(RESEARCH ARTICLE)



## How digital marketing evolved over time: A bibliometric analysis on Scopus database

Sangeeta Rajput <sup>1</sup> and Samrat Ray <sup>2,\*</sup>

<sup>1</sup> *Marketing Management, IIMS, Pune, Maharashtra, India.*

<sup>2</sup> *International Relations, IIMS, Pune, Maharashtra, India.*

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### Abstract

The following research work traces the trends and patterns in the development of digital marketing as a science over a period of time with collaborative, strategic inputs from various authors. A bibliometric analysis has been formulated to understand the evolution of digital marketing between 2000 and 2019 on various key parameters like citations, author contribution, patterns and trends in its developmental stages. Researchers gain futuristic knowledge by analysing such patterns and best practices through such analysis. The analysis is done through various analysis like citation analysis, descriptive statistics, author contribution analysis and visualization techniques to better understand and recommend futuristic goals and aspiration as in research objectives. The analysis has wide spread industry applications with understanding of definite patterns in evolutionary matrix wherein digital marketing is concerned through new ideas and innovation. There lies greater scopes for future developments based on this particular research area for understanding the scopes of authors

**Keywords:** Digital Marketing; Bibliometric Analysis; Scopus; Citations; Database

## 1. Introduction

### 1.1. Define the Research Question

The research question for this bibliometric analysis is to look at the evolution of digital marketing over time using a database. To recap the growth, trends and key themes in digital marketing research between 2000 and 2019, we are looking at growth, trends and key themes in digital marketing research. This analysis is about patterns in publication output, citation trends, author collaboration networks, and themes in the field. To determine changes in scholarly interest and activity in digital marketing (Faruk *et al.*, 2021), the study analyzes publication trends over a two-decade of time. The rate of publication growth as well as any changes in research output can be looked at. The aim of the analysis is to understand impact and dissemination of key research contributions within the field.

The research wants to examine collaboration networks among researchers, institutions and countries. Identifying prolific authors, institutions and countries along with exploring the extent of collaboration within the research community is part of this. Researchers can gain a better understanding of how knowledge is produced and distributed by observing the collaboration networks. The analysis tries to find dominant themes and areas of research within digital marketing. This involves finding trends and topics in the literature. It will look at the articles to find the key research groups for the study. This bibliometric study aims to give a full picture of how digital marketing has changed over time, focusing on the main factors, trends, and new ideas that have been added to the field.

\* Corresponding author: Samrat Ray

## 1.2. Gather Data

As stated by Appio *et al.* (2021), the Scopus database was used to get bibliographic data so that bibliometric study could be done on how digital marketing has changed over time. The collection had studies that were about digital marketing, reference counts, paper names, writers, years released, titles, keywords, and reference counts were some of the things that were collected. The vast majority of these were very significant.

- The paper's title came from a website. Short descriptions of the papers' topics are given by their names.
- The details of the authors of each volume were gathered. The analysis can be done with this.
- The documents were published years to study research output trends and changes over the two-decade period from 2000 to 2019. It was possible to learn more about the growth and development of digital marketing research using this information.
- The abstract gives a concise summary of the content. A deeper understanding of the research topics and methodologies used in the literature can be obtained by getting the abstract from the dataset.
- To find prevalent topics and themes in digital marketing research, the words were used. Key areas of interest and focus were identified with help of analyzing keyword frequencies and usage patterns.
- The impact and influence of individual publications were assessed with the help of the citation counts. The more citations found, the more effectively research findings are disseminated.

The analysis was able to look at various aspects of digital marketing research with the help of the Scopus database. This affluent dataset allows for a comprehensive bibliometric examination of the evolution of digital marketing.

## 1.3. Data Cleaning and Preprocessing

Several steps were taken to clean up the dataset, which was extracted from the scopus database for the purpose of bibliometric analysis on the evolution of digital marketing, and to preprocess it for bibliometric purposes. There were duplicate entries in the dataset and they were removed. It was important to make sure that each publication was only represented once. There were a lot of the same author names and places of work. No mistakes were made by writing each author's name in the same way. The same people who followed the rules were all checked (Aroyssi, Fathin and Priabas, 2022).

As stated by Akmaljon, Erkin and Nodira (2022), there were attempts to fix issues that were not right. The release years had to be checked to make sure they fit the time frame. A way to guarantee that the numbers fit the text of every release was also talked about. Checking the data is one way to find strange things in it. The information was shown to be right and trustworthy. Following steps were taken to fix the mistakes: approval and proofread.

It was checked that the information was complete using computer tools. The purpose was to complete gaps. There was a step where the data had to be cleaned up so that it could be used in another process. This data was cleaned up by getting rid of copies, making sure that author names and links were all the same, and fixing any mistakes. This made sure that the data was correct, consistent, and reliable. A full bibliometric study of how digital marketing has changed over the given time period was set up (Aldrighetti *et al.*, 2021).

According to Cluley, Green and Owen (2020), when the data was being cleaned, it was important to keep an eye on the reference numbers. Articles that are cited a lot in their area are thought to be very important. It was checked that the number of sources was correct. There was a close look at any changes in the number of sources. Due to checking citation numbers, the data remained pure, allowing a full study of reference trends and their impacts on digital marketing. The data were cleaned and organized carefully so that bibliometric analysis could be done.

## 1.4. Data Analysis

### 1.4.1. Descriptive Statistics

The bibliometric study used descriptive statistics to look at different parts of the books. The total number of digital marketing papers was kept track of from 2000 to the present. The research showed how many papers there were.

It was looked at how the media affected the community. The average number of sources for the text has been found. It's clear that digital marketing is getting a lot of attention. By using this metric, impact can be measured and scholarly trends can be detected. The average number of authors was calculated. The amount of research done together is shown in this metric. An average of 2 authors per document was discovered, whereas the average number of authors per

document was 2. The study of 18 subjects show that collaborative research is becoming more common (Chaffey and Smith, 2022).

As stated by Chakti (2019), the examination analyzed the distribution of single-author and multi-author documents. Despite the presence of numerous authors in the literature (2.), it was pointed out that a considerable amount of them were multi authors. The dataset comprised numerous single-author documents as well. This finding shows a wide range of research approaches.

The overview of the digital marketing literature is in the descriptive statistics. The metrics can be used to find trends, gaps and areas of interest in the field with the help of the bibliometric data. They facilitate a more complete understanding of the evolution and dynamics of digital marketing research over time, enabling better decision-making and pointing to future research directions in the field (Chaffey and Chadwick, 2019).

#### *1.4.2. Citation Analysis*

As stated by Dastane (2020), digital marketing literature can have an effect on individual papers. Researchers can use citation networks, distributions and impacts to understand the scholarly landscape. The relationship of papers in the digital marketing literature is examined first. This analysis indicated the domains of active collaboration and active research among academics.

It looked at the most important research and patterns. When researchers look at how often and where the links are found, they can find papers that had a big impact on other research and study. A great deal of people used certain papers. Different studies have changed what has been written about digital marketing as a whole (Dilami, Hosseini and Ahmadi, 2021).

As per Damar (2021), citation counts were used to find out how well-known a piece was in the community. There were names of the papers that were mentioned the most in the dataset as well as the dataset itself. It can use citation analysis to look at how digital marketing writing is put together and how it works. By looking at trends, patterns, and impacts of citations, researchers can find important contributions, see how ideas change over time, and judge the impact of each work on the field. There is a lot of information out there about digital marketing right now. This review helps students figure out where to do more research and what to study next.

#### *1.4.3. Co-authorship Analysis*

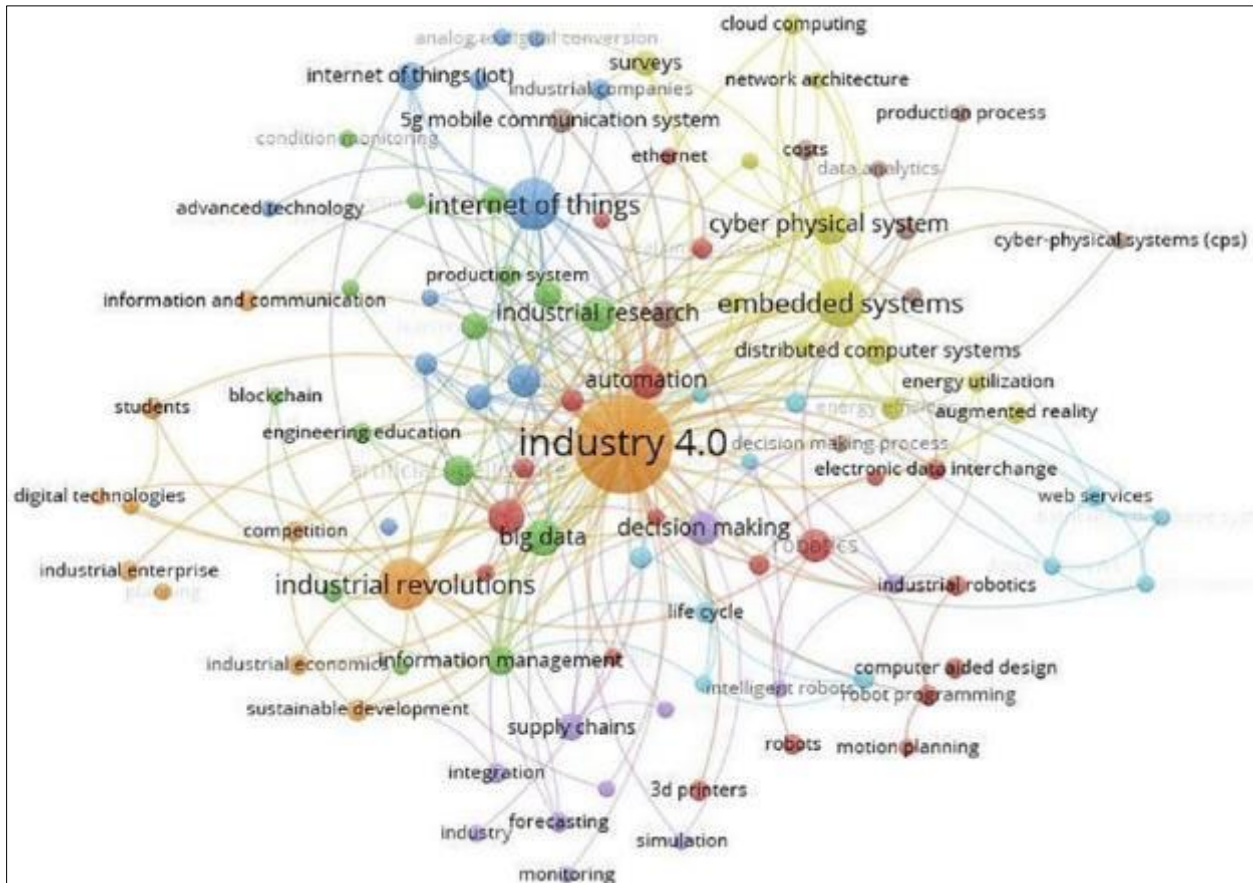
Digital marketing literature has networks of authors. Researchers can investigate co-authorship to find key contributors. The extent of collaborative research in digital marketing was analyzed by looking at author collaboration networks. The patterns of co-authorship were looked at. It was found that the digital marketing community is related to scholars (Diamond, 2022).

According to Deiss and Henneberry (2020), a lot of collaborative research in digital marketing is done by institutions and countries. Researchers can use the affiliations of co-authors within the field to find institutional connections and international collaborations that promote innovation and knowledge sharing. Some institutions and countries have a significant impact on collaborative research in digital marketing according to the examination.

Co-authorship networks were analyzed to understand how collaboration works. The network metrics were used to find influential authors. The examination demonstrated the arrangement of collaborative networks and the transmission of knowledge within the field. Co-authorship analysis can help you understand the collaborative nature of research in digital marketing. Researchers can look at collaboration networks among authors, institutions and countries. This analysis gives a snapshot of the current state of collaborative research and informs future research directions and strategies (Erlangga, 2021).

#### *1.4.4. Keyword Analysis*

As stated by Herold, Fahimnia and Breitbarth (2023), digital marketing literature contains useful information. Digital marketing research can be better understood by researchers who focus on the most commonly used keywords and analyze their trends over time by identifying those keywords that are most commonly used in search queries. The bibliometric analysis looked at the frequency of occurrence for the 925 documents. "Digital marketing," "social media marketing," "internet," "machine learning," "web 2," "social networks," "customer relationship management," "Facebook," and "twitter. There is something for everyone in the field of digital marketing.



**Figure 1** Keyword Analysis in Digital Marketing

The focus of digital marketing research has changed over the years due to changing trends in keyword usage. Changing the frequencies of the keywords can be used to identify emerging trends and shift research priorities. The analysis could show that artificial intelligence, big data, and mobile marketing are more important than ever. It is possible to determine the interdependence of topics in the digital marketing literature (Lies, 2019).

As stated by Larsson and Teigland (2020), researchers can find underlying themes and relationships between different areas of research if they identify clusters of related keywords. The analysis may show that the topics of social media marketing, online advertising, and consumer behavior are related in some way to the field of digital marketing. Digital marketing literature is full of topics and trends. Researchers can gain a deeper understanding of the evolving landscape of digital marketing research and identify emerging areas of interest and research priorities with help of identifying frequently used keywords and analyzing their trends over time.

#### 1.4.5. Publication Trend Analysis

The use of publication trend analysis allows researchers to understand the growth and evolution of research over time. In the digital marketing world, analyzing publication trends can help researchers understand the pace of scholarly activity, identify key periods of growth or decline, and uncover emerging research areas and topics of interest. The bibliometric analysis done on the digital marketing literature gave a complete dataset for exploring publication trends. It is possible for researchers to see how writings have changed over time (Massaro, 2021).

As per Rijswijk, Klerkx and Turner (2019), the increase in digital marketing research over the last 20 years can be explained by a large study of publishing trends. After 2010, more study was done. We were entering a time of fast growth. Now that technology is better and more people use the internet and social media, this trend is growing. In the business world, digital marketing is also becoming more important.

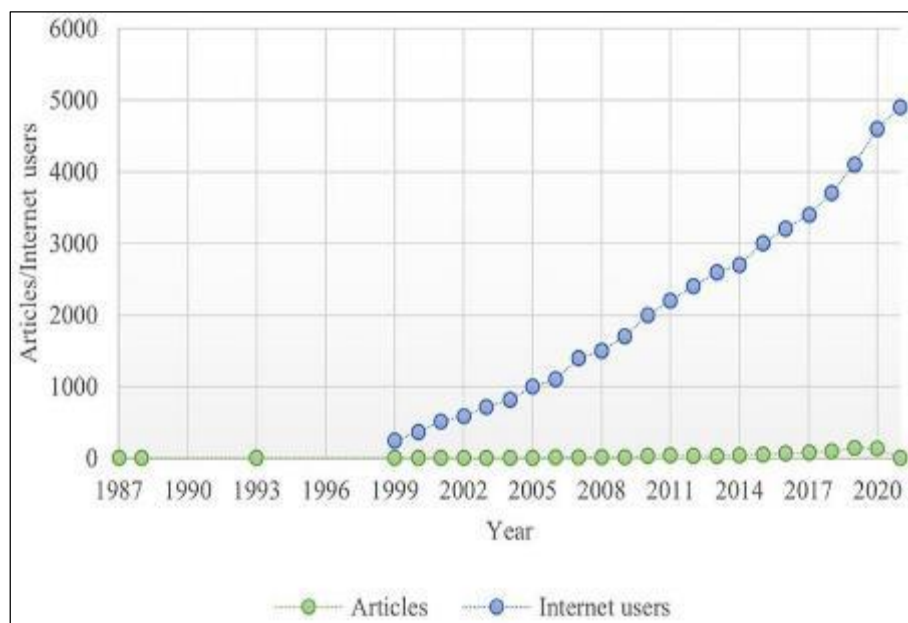
It was clear that there had been a rise and then a fall in the release trends of the digital marketing books. After the turn of the century, not much research was done. A huge increase in the number of studies and papers happened from 2010 to 2020, the second decade. The trend analysis piece can help researchers figure out why there is so much more study

on digital marketing. When experts look at how outside factors affect writing trends, they can learn more about the forces that drive digital marketing (Suleman *et al.*, 2022).

As stated by Tekic and Koroteev (2019), a study of release trends found that the literature on digital marketing has both new areas of research and common topics. The fact that artificial intelligence, big data, and mobile marketing are getting more attention now shows that they are becoming more important in the field, according to the study. No one knows for sure what the next big study trend will be. For example, to see how digital marketing study has grown and changed over time, you can use publication trend analysis. Researchers can gain a deeper understanding of the dynamics shaping the digital marketing landscape with the help of patterns and trends in scholarly activity over time.

### 1.5. Visualization

To effectively communicate insights and trends to both academic and non-academic audiences, the findings of a bibliometric analysis are necessary. The article on the evolution of digital marketing discusses how visualization techniques can be used to demonstrate the main findings in a clear and compelling way, as suggested in the article on the evolution of digital marketing. The line graphs are used to show trends. Plotting the number of publications can indicate whether there has been scholarly activity increasing or decreasing it. This visualization can assist in showing periods of growth and decline, as well as showing the influence of external factors on output (Utulu and Mustapha, 2023).



**Figure 2** Annual scientific production in digital marketing

As per Vieira *et al.* (2019), the contributions of different countries can be compared on bar charts. Researchers can quickly identify the most prolific contributors with the aid of publication or citation counts. There are co-authorships among researchers. Using heatmaps, you can explore citation network usage patterns over time. If citation links are colour-coded, researchers can identify trends that aren't immediately apparent from raw data. There are hidden patterns in the digital marketing literature.

Graphs show collaboration networks. Researchers can see the structure of the digital marketing research community with the help of citation networks. It is possible to identify clusters or communities of researchers by using network graphs.

As stated by Appio *et al.* (2021), word clouds are a popular visualization method. If researchers can see the frequencies of the words in a cloud, they can quickly identify the most popular topics in the literature. Word clouds can be used to give a summary of findings. In order to identify trends, patterns and relationships within the digital marketing literature, they need effective visualization. A variety of visualization techniques can be used to increase impact and accessibility.

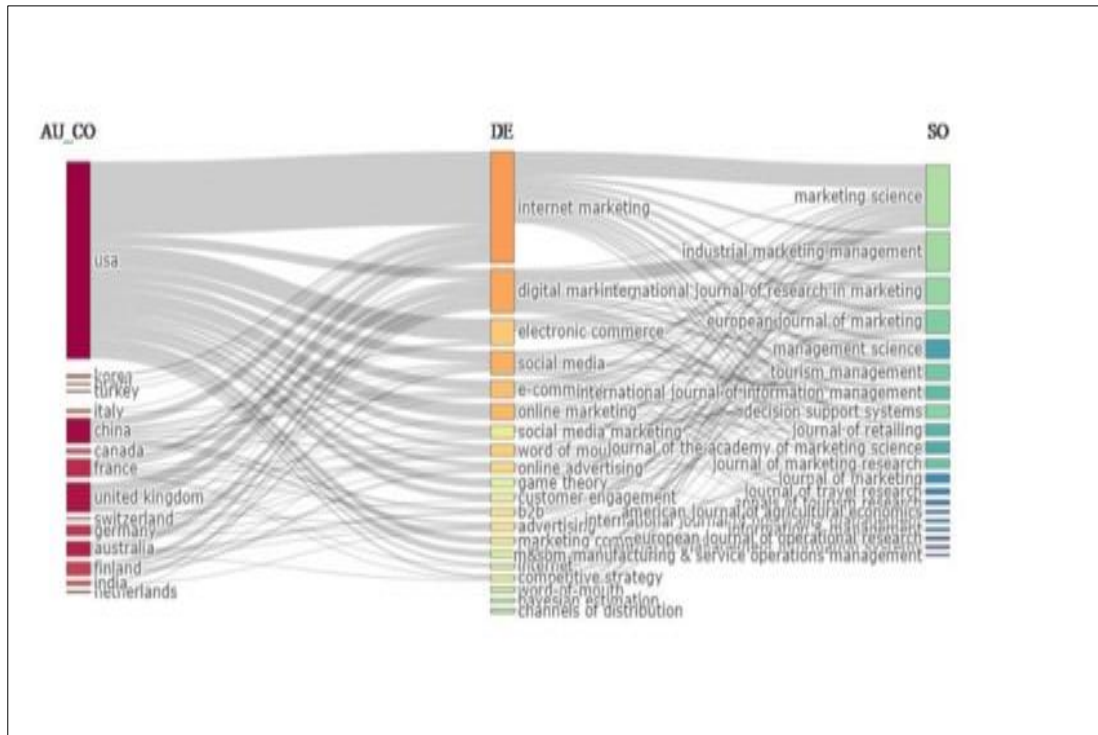


Figure 3 Three field analysis

## 2. Interpretation

As per Rijswijk, Klerkx and Turner (2019), digital marketing literature's bibliometric analysis gives valuable insight into the field. The analysis shows the growth of collaboration networks and the focus of research in digital marketing. The study indicates that academic research on digital marketing has become more prestigious since the 2010s.

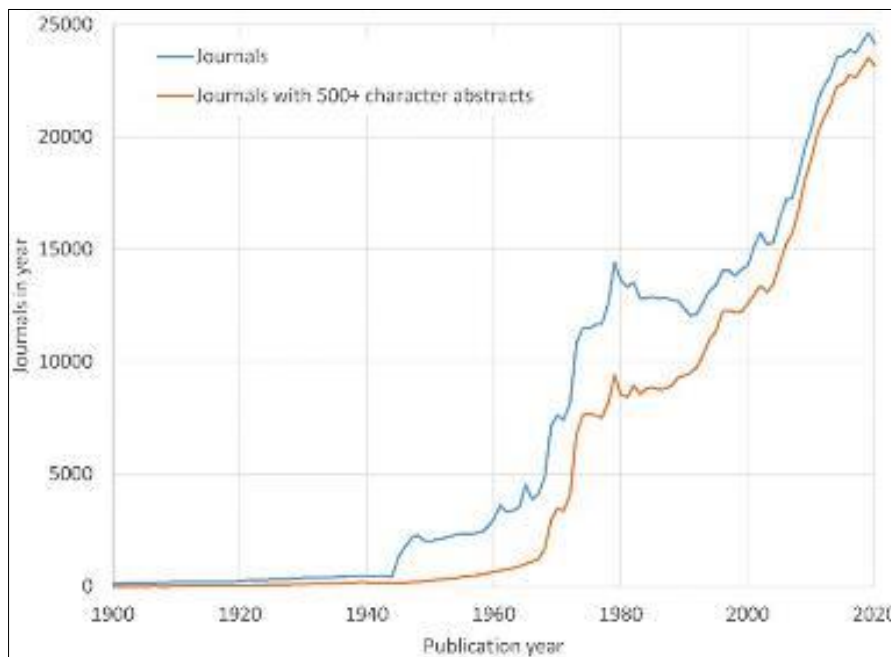
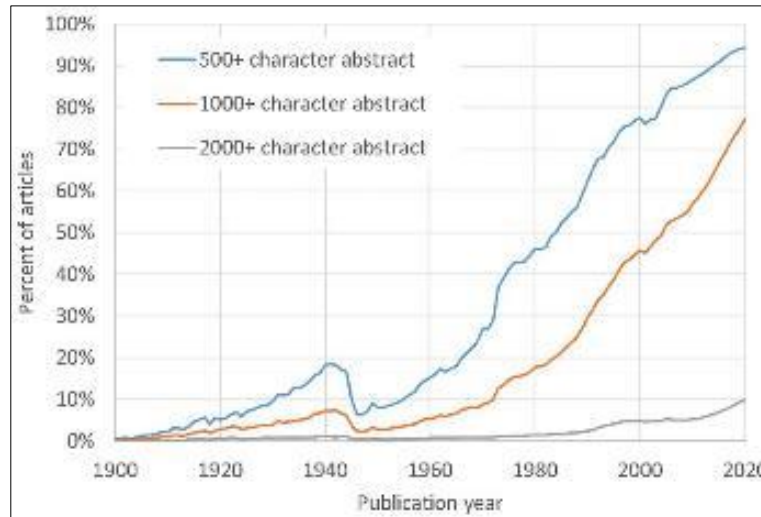
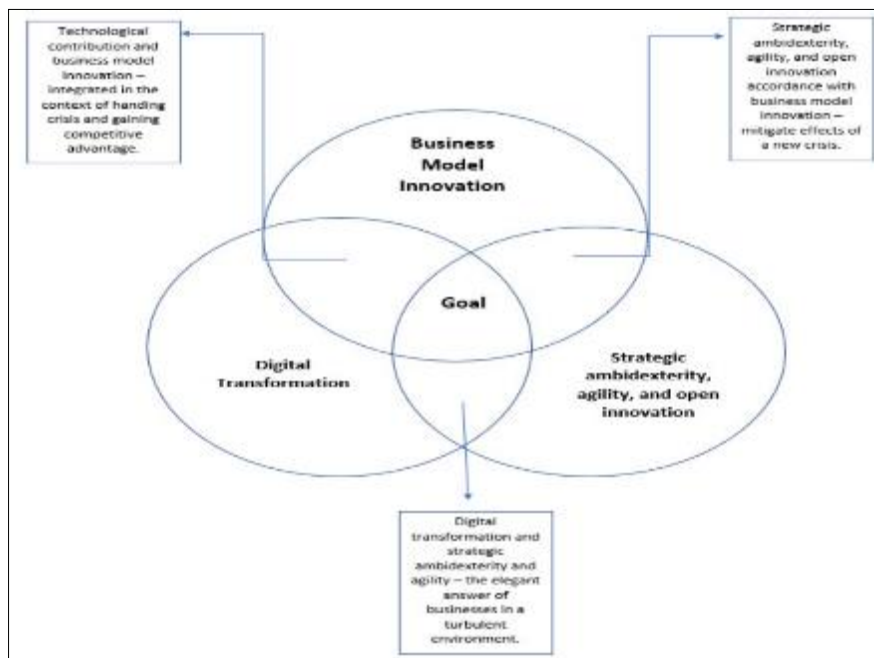


Figure 4 Number of different journals on Digital Marketing in Scopus by year (with 500+ character abstracts)



**Figure 5** Number of different journals on Digital Marketing in Scopus by year (with 2000+ character abstracts)

The rise is related to the surge in internet and social media usage during this era, which shows a close relationship between technological progress and digital marketing research interest. As the number of publications increases, digital marketing strategies are more important. The study shows a pattern of cooperation, with most documents being co-written. The interdisciplinary nature of digital marketing research is highlighted by the collaborative approach as scholars from various fields often contribute to the ongoing research.



**Figure 6** A new business model innovation for SMEs based on digital transformation

Start-up Maturity Levels	Early-stage	Stabilization	Scale-Up	Maturity
	1st level	2nd Level	3rd Level	4th Level
Key level processes	First product release First Customers First Revenues	Additional key features Additional customers	Specialization and coordination Scaling to several customers/new markets	Expansion/ extension (build vs. buy)
Resources	Lack of time, personal, funds; Focus on technical functions Strategically non-aligned	Short-term funds available, in search of new investments or higher sales; Team roles need to be strategically defined; Main KPIs identified; Resources not yet in line (HR, Strategic alignment)	Easily attracting new investment (if needed); Team Roles defined. Targeted hiring, improving quality and implementing processes*	Targeted hiring, improving quality and implementing processes* Experienced team and leadership in place Resources functionally aligned
Maturity Level Challenges	Defining VP; First sales; Market and customer discovery; Lack of knowledge diffusion and regular practices; Lack of strategic plan of product development	Product still not finalized; Customer base still growing; Team not yet complete; Low level of work practices establishment; Business objectives planned (with milestones and KPIs) Marketing and sales getting set with clear objectives and measurements	All business processes getting refined.  Growing into stable innovative-working culture (attracting the best talent)	Decision making connected to growth (new markets, customers, industries)
Digital Marketing Challenges	Lack of dedicated staff/team/digital marketing resources; Lack of market and customer understanding; Lack of customized market messaging; Lack of (or basic) marketing planning; Limited (or no) data analytics use from DM Channels Digital marketing as a separate start-up function	Marketing role defined; Audience-Channel fit; Corresponding Objectives and measures identification (leads and conversion); Higher need for brand awareness and customized content marketing; Digital marketing actively supporting other business processes	The start-up is in process of having or has a dedicated inhouse team that generates new ideas, design campaigns and executes them and/or outsources parts of process.  Smart data obtained from DM converted into insights for decision making.	Full alignment between data, marketing, sales, and other sections; Creating relevant content, campaigns, and activities in all types of formats, channels to position/remain as a market leader/ enter new markets
Digital Marketing Extended Potentials of Impact	Product-Market Fit; Sales & Lead Generation*; Market Research; Customer Education & Support; Engagement and Retention; Community Building Brand Building &Promotion* Testing & Analytics*; Partnership development; Raising Investor Awareness	Sales & Lead Generation*; Product Features Optimization; Testing & Analytics*; Brand Building &Promotion*; Transparency Community Building; Internal Process Development; Partnership development; Customer Education & Support*; Engagement and Retention*	Product Features Optimization Sales & Lead Generation* Product-Market Fit (new products/markets) Testing & Analytics* Cultivating long-term relationship* Transparency Culture building and talent search Raising Investor Awareness	Internal Process Development (Complete data optimization); Cultivating long-term relationship* Culture building and talent search Product-Market Fit (new products/markets); Brand Building &Promotion* Sales & Lead Generation* Communication, Engagement and Retention

Figure 7 Start-up maturity levels and digital marketing growth potentials.

The high collaboration index shows how important it is. In the analysis of the keywords, the role of digital marketing is highlighted. The dominance of the term "digital marketing" suggests a strong focus on overall themes related to digital strategies and technologies, despite the fact that many of the terms are related to social media, internet and customer relationship management.

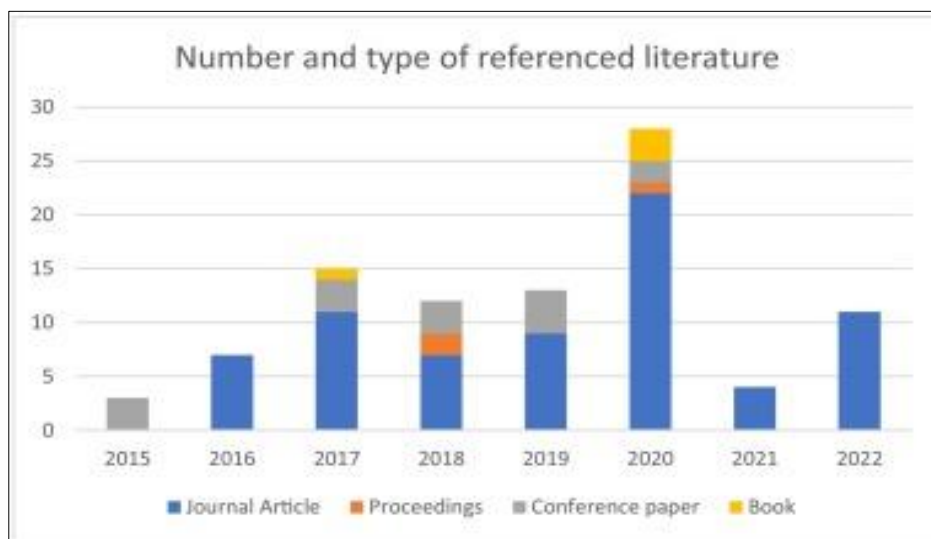
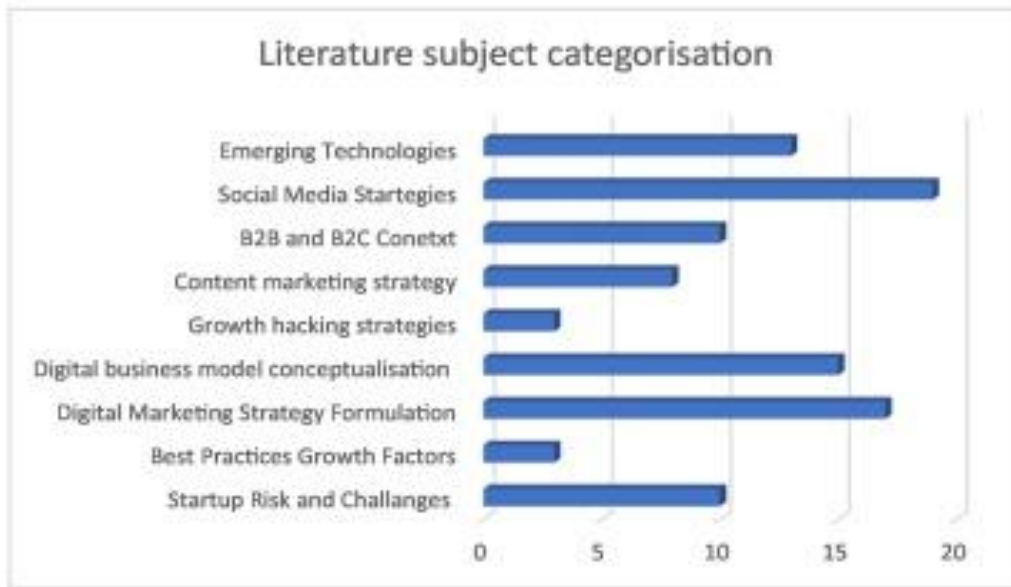


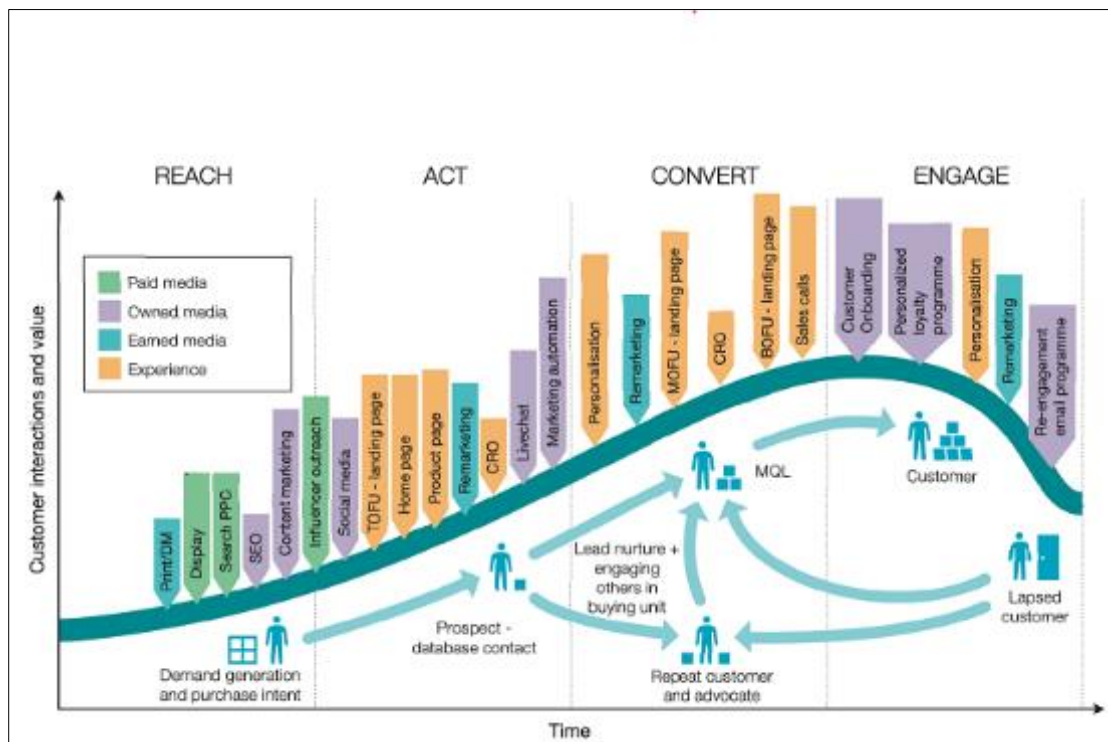
Figure 8 Number and Type of Referenced Literature on Digital Marketing





**Figure 9** Literature on Subject Categorisation on Digital Marketing

Key research clusters are strategic planning, mobile marketing and demographic analysis. The analysis shows that the US, UK and India are the top contributors. The distribution demonstrates the worldwide character of digital marketing and the diverse range of perspectives and methods proposed by scholars from various fields. According to the analysis, the north of the equator contributes more to aid than the south of the equator. There needs to be more collaboration among researchers (Chaffey and Chadwick, 2019).

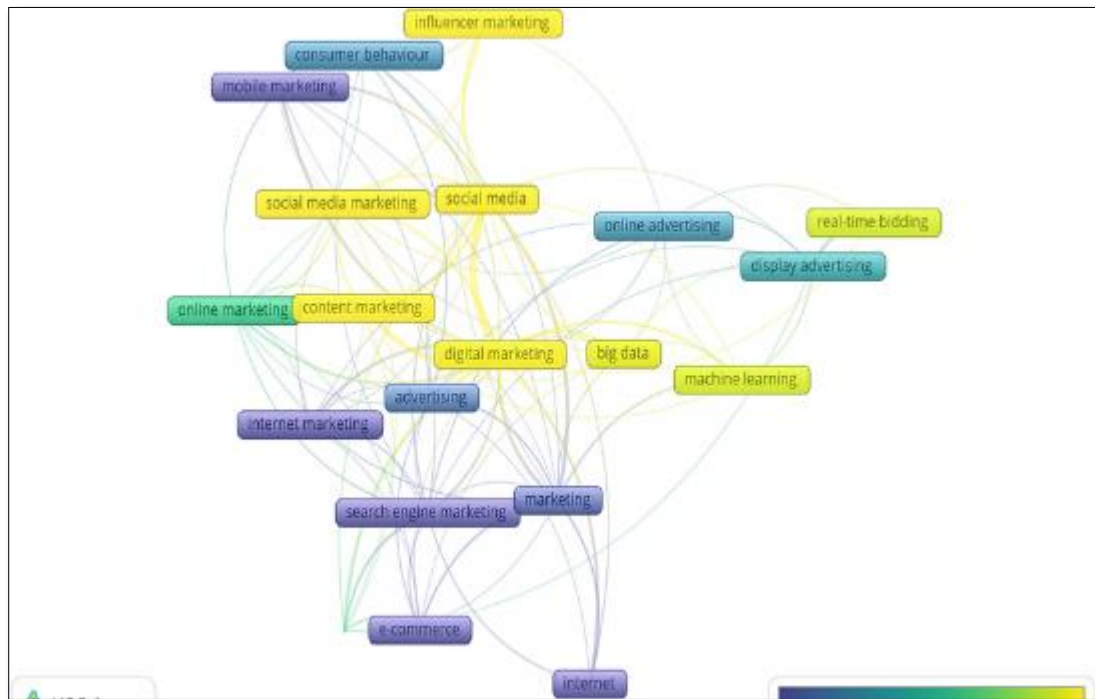


**Figure 10** Growth in the use of digital media and technology

As stated by Herold, Fahimnia and Breitbarth (2023), there are many different types of digital marketing research according to the word-cloud analysis. The keyword significance reflects the diverse range of topics and themes within the realm of digital marketing, including e-commerce, social media marketing, and online consumer behaviour. The complexity of modern marketing practices is shown by this diversity. The growth of digital marketing literature has

been observed in the past ten years. Digital marketing's growing importance can be seen in the growth of consumer behaviour, technological advancement, and market dynamics. Digital marketing is a must if you want to remain competitive in the digital age.

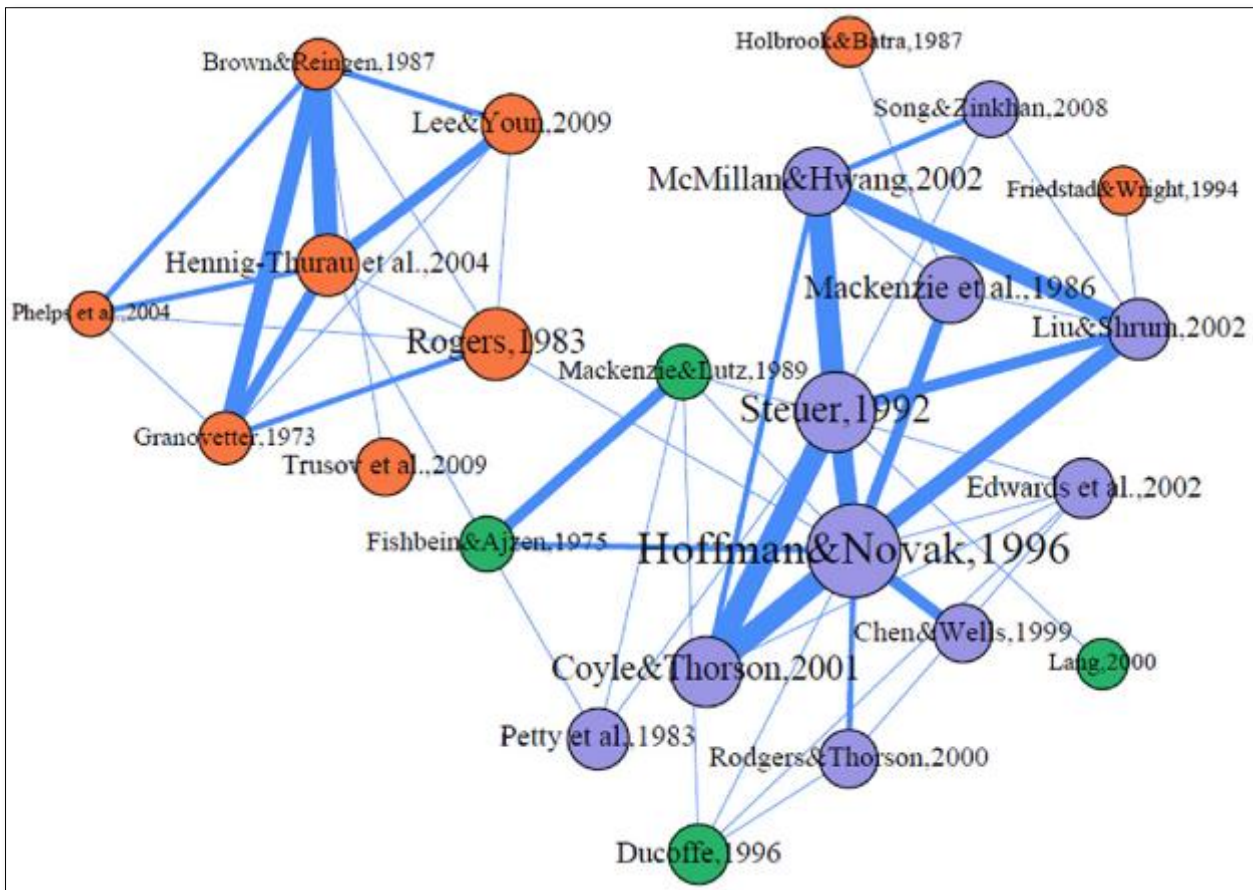
Despite the important benefits of the bibliometric analysis, it should also be noted that it has its limitations. The use of data from a solitary database may not accurately depict the entire literature of digital marketing. The analysis only looks at publications that use the term "digital marketing". Future research could consider a broader range of words and use data from multiple databases. The field of digital marketing is constantly changing according to the interpretation of the bibliometric analysis. The analysis can inform future research directions, policy choices, and practical implementation scenarios in digital marketing, ultimately contributing to the growth and development of digital marketing as a profession (Chaffey and Chadwick, 2019).



**Figure 11** Overlay visualization of top 20 author's keywords

Through the bibliometric analysis of digital marketing literature, it is possible to gain a deeper understanding of the nuances of research patterns and trends within the field by looking at the literature and bibliometric analysis results. Digital marketing is represented by different research groups. The biggest of the clusters is strategic planning with digital marketing. The scholars want to explore strategic frameworks and approaches to digital marketing, reflecting the growing recognition of digital strategies as an important part of marketing planning and execution (Suleman *et al.*, 2022).

As stated by Herold, Fahimnia and Breitbarth (2023), there is a growing role for mobile technologies in marketing practices. Mobile platforms are being used by marketers to reach new audiences and promote brand awareness, as smartphones are increasingly being used by more than a quarter of the world's population. The cluster shows the evolving landscape of digital marketing, where mobile devices are the primary point of contact for consumer interactions, requiring tailored marketing strategies and tactics. The identification of a research cluster dedicated to demographic analysis shows the emphasis on data-driven marketing approaches. More and more marketers are using demographic data and digital channels to improve their customer experience.



**Figure 12** Co-citation network.

As stated by Akmaljon, Erkin and Nodira (2022), with the convergence of marketing analytic and digital technologies marketers can get deeper insights into consumer behavior. The bibliometric analysis gives a comprehensive understanding of the evolution and trends within the field of digital marketing. Research clusters, keyword prevalence, and publication trends are used to provide information on thematic focus, research priorities, and emerging areas of interest in the field. By contextualizing these findings within the broader landscape of marketing theory and practice, researchers and practitioners are able to gain actionable insights to inform future research agendas, strategic decision-making and practical applications in the field of digital marketing.

### 3. Conclusion

Several key findings from the bibliometric analysis of digital marketing literature show the evolution, trends and research priorities within the field. The research clusters were strategic planning with digital marketing, mobile marketing and demographic analysis. Digital marketing research includes strategic frameworks, mobile technologies, data and consumer behavior insights. The scope of digital marketing research is exemplified by the use of certain words in the field. Over the past 20 years, publications of digital marketing literature have increased, reflecting the growing significance of digital strategies in today's marketing strategies.

The findings have had a huge impact on both industry and academia. It is possible to identify research clusters and keyword prevalence from an academic perspective. Advancing in strategic planning, mobile marketing, demographic analysis and other relevant fields can be accomplished through the efforts of scholars who concentrate on these fields. Actionable insights for practitioners and marketers from a practical point of view can be obtained from the findings, according to the findings. You can develop digital marketing campaigns if you know the trends. By utilizing research clusters such as mobile marketing and demographic analysis, marketers can optimize their marketing campaigns and reach their intended audiences more efficiently.

Digital marketing research should be looking at new technologies. The impact of artificial intelligence, big data, and machine learning are being investigated. Digital marketing effects on different industries can offer valuable insights into sector-specific difficulties and opportunities. Through the use of bibliographical sources, one can gain knowledge about the evolution, trends, and research priorities of digital marketing, including the literature of the field and the literature of digital marketing itself. By knowing the prevailing research clusters and publication trends, scholars and practitioners can gain insights to inform future research agendas, strategic decision-making, and practical applications in the dynamic landscape of digital marketing.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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