Digital Advertisement in the Age of Generative AI: A Bibliometric Analysis

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Abstract

With rapid advancement in artificial intelligence, the Digital advertisement industry has taken new opportunities and faces challenges that play a significant role in an advertising agency. In this paper, researcher provides an in-depth review of Artificial Intelligence in digital advertisements. The study aims to examine the relevance and progress of the "AI" and "Digital advertisement "concepts in the literature available in the Web of Science database/Scopus and retrieved 127 articles from the period (2000-2023). The study has been based on bibliometric analyses. In this study, the researcher found the most influential studies and authors and revealed the distributions and impact of publication in AI and Digital advertising. The result indicates the most relevant source is applied marketing analytics, and the most relevant author is AL GASAWNEH Additionally, Finland is a most cited country. The result reveals a systematic map of existing studies.

Keywords: Artificial Intelligence, Digital Advertisement, Online advertisement, Internet Advertisement.

Introduction

The Internet has become a significant networking tool, capturing the interest of marketers eager to engage customers through this dynamic platform. This advertising approach stands out by using the Internet and World Wide Web to efficiently communicate marketing messages. Unlike traditional advertising, it allows consumers to interact immediately—clicking on ads to ask questions, gather more details, or make purchases directly. This functionality enables marketers to target their audiences with extraordinary accuracy.

Numerous forms of Internet advertising exist, such as contextual ads on search engine results pages, banner advertisements, promotions on social media platforms, flash ads, and online classifieds, many of which

are managed by ad servers. As the field of Internet advertising expands, it is projected to a considerable share of advertisers' media spending. The benefits of online advertising include flexibility, improved demographic targeting, tailored messaging, and broad outreach. Moreover, it offers cost-effective and comprehensive tracking and measurement, all while promoting creative strategies.

This study aims to evaluate the effectiveness of Internet advertising. The transactional environment for business-to-business marketers is evolving thanks to the Internet. Companies that adhere to traditional transaction practices often lag behind those that adopt the operational efficiencies and effectiveness offered by online platforms. For both large and small businesses, driving sales is critical for generating revenue, making digital advertising a vital force in the rapidly changing media landscape.

Concerns are arising that traditional media-based advertising strategies may need reevaluation in the digital context. To explore how online advertising methods should adapt, twenty-one detailed interviews were conducted with key players in the digital advertising industry. These discussions identified five major trends: a shift towards permission-based advertising, enhanced ad personalization, increased integration across multiple devices, greater interactivity, and the establishment of performance-based metrics. Based on these insights, nine recommendations have been proposed for creating and managing effective digital advertising campaigns.

In summary, marketing can be seen as a comprehensive process designed to create, communicate, and deliver value to customers while cultivating beneficial relationships for businesses and their stakeholders. The impact of social media on online commerce is significant, with platforms like Facebook and Twitter giving rise to "social commerce" where virtual communities gather around particular brands and products. This social interaction enriches the consumer experience and opens new pathways for engagement within the digital landscape.

The Size and Growth of Digital Advertising

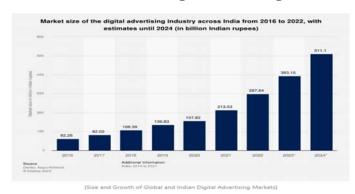


Figure 1: Market Size of the digital advertising

The above chart revealed the growth and size of digital advertising markets from 2109 to 2022.

According to report by Dentsu, in 2020 the market worth of digital advertisement was \$332 billion. The above report also revealed that digital advertising market will grow by b10.4% in the year 2021, reaching \$366 billion, and by 11.3% in the year 2022, reaching \$408 billion.

The report also releaved that in year 2020 the Indian digital advertising market was worth \$2.8 billion, accounting for 28% of the total advertisement market.

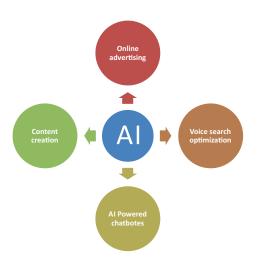
Digital advertisement and artificial intelligence



Figure 2: Digital advertisement and AI

Artificial Intelligence is revolutionizing digital advertisement and its paly an important role in digital advertisement. Artificial intelligence is used in different way across the devices we are use daily. There are different application for artificial intelligence and its various subset in the market.

AI play different role in digital advertising i.e.



The above chart show that AI play a different role in digital advertisement i.e online advertisement ,content creation, AI-Powered chatbotes and voice search optimization. With the help of AI every company create creative content of advertisement and they were develop chatbotes which is very helpful to the customer they give more information about the product and create awareness among the customer. We can say that Al play a major role in a business.

Research Method

The primary goal of bibliometric analysis is to gather existing literature and relevant topics related to a research subject in order to produce objective results that can be verified and repeated. This process seeks to classify earlier studies and provide a thorough evaluation of the research outcomes. To demonstrate that the study contributes new insights to the existing body of work, the findings should align with the research question (Yadav et al., 2024).

Research Questions

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In this study, artificial intelligence and digital advertisement related publication were analysis.

RQ 1: How has the annual scientific output changed over time?

RQ 2: Which journals are the most significant in Scopus and Web of Science?

RQ 3: Who are the key authors in Scopus and Web of Science?

RQ 4: How has an author's output varied over time?

RQ 5: What is the scientific output by country over time?

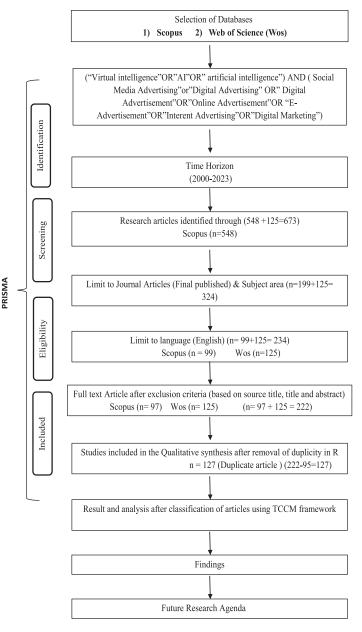
RQ 6: Which document has received the most citations?

Sampling and Methodology

The research utilizes a combined approach, conducting both bibliometric and framework-based analyses of literature related to artificial intelligence in digital advertising. In the study, bibliometric analysis is applied as a thorough and detailed technique for examining this area.

Review Method

PRISMA FLOW CHART



Identification

In this stage, researchers identified the keywords through a review related to artificial intelligence and digital advertising. The designated keywords utilized in Scopus and Web of Science, following the search criteria of "title-abstract-keywords" and "title," aim to pinpoint AI in the literature related to digital advertising research articles. By leveraging the Web of Science and Scopus databases, researchers can access the highest number of articles. The chart above displays the search keywords, outcomes of the literature search, and the screening procedure following the PRISMA guidelines. Between 2000 and 2023, a total of 548 articles were published in leading journals. The results from Scopus and WOS were combined in R and analyzed using Biblioshiny.

Screening

In this stage, the researcher screened the important articles. Only articles in their final published form, written in English, and related to the fields of Business Management & Accounting and Social Sciences were considered. Other types of publications, including conference proceedings, book chapters, and books, were excluded.

Eligibility

In the 3rd stage the researcher were reviewed the article to find the collected article is related to the subject or not. Others documents which were not related to the subject such as AI and digital advertisement were exclude from the file.

Inclusion

In the last stage, researcher were ensure that any duplicate articles were not include the merger file. In this stage duplicate file were removed and find the 127 article were used for analysis.

Result

Main Information

Table 1: Highlight Of Data

Description	Result
MAIN INFORMATION ABOUT DATA	
Timespan	2001:2023
Sources (Journals, Books, etc)	90
Documents	127
Annual Growth Rate %	6.21
Document Average Age	2.78
Average citations per doc	19.64
References	0
DOCUMENT CONTENTS	
Keywords Plus (ID)	284
Author's Keywords (DE)	510
AUTHORS	
Authors	382
Authors of single-authored docs	24
AUTHORS COLLABORATION	
Single-authored docs	25
Co-Authors per Doc	3.17
International co-authorships %	16.54
DOCUMENT TYPES	
Article	121
article; early access	4
Review	2

Number of articles published each year

The information of data which was extracted from Scopus and web of science show in above table. The total publication of 127 publications from the period of 2001-2023 was retrieved for final analysis. There were 284 keywords from 382 authors worked on AI in digital advertisement. The above table revealed that the average citation per document is 19.14.

Annual Scientific Production

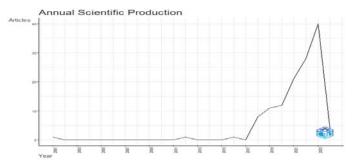


Figure 4: Yearly Publication

The above figure reveled that publication growth is increased in the time period of 2017 to 2023. The first publication on the Artificial intelligence in digital advertisement in 2016 and after that significant growth in average publication . Maximum publication of 40 in the year of 2023.

Most relevant journal

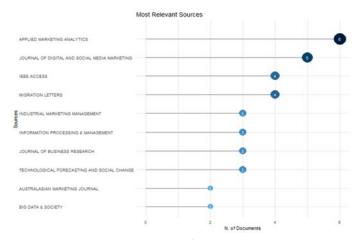


Figure 5: Most relevant source

The above figure shows that the 10 top most journals in the field of artificial intelligence in digital advertisement, which is owned by different publishers. Applied marketing analytics is the most relevant source which has 6articles. Journal of digital and social media marketing has published 5 articles in this filed.

Most productive Journal

Table 2: Most Productive Journal

Journal	h_index	g_index	TC	Тр	PY_start
APPLIED MARKETING ANALYTICS	3	3	15	6	2019
IEEE ACCESS	3	4	51	4	2019
INDUSTRIAL MARKETING MANAGEMENT	3	3	155	3	2020
JOURNAL OF BUSINESS RESEARCH	3	3	84	3	2021
AUSTRALASIAN MARKETING JOURNAL	2	2	104	2	2021
ELECTRONIC COMMERCE RESEARCH AND APPLICATIONS	2	2	23	2	2018
INFORMATION PROCESSING & MANAGEMENT	2	3	10	3	2022
INFORMATION SYSTEMS FRONTIERS	2	2	15	2	2022
INTERNATIONAL JOURNAL OF ELECTRONIC COMMERCE	2	2	143	2	2001
INTERNATIONAL JOURNAL OF MARKERESEARCH	2	2	62	2	2018

This table was created with a Scopus and Web of Science dataset via Excel. The above table lists the ten most productive journals. The journals not in the marketing field were excluded from the analysis results. At the top, Applied marketing analytics has the most publications on artificial intelligence and digital advertisement.

Authors Production Over the time

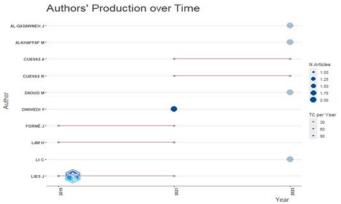


Figure 5: Authors' Production Over time

The above graph revealed that the author produces artificial intelligence in digital advertisements. Dwivedi Y is the most productive author, with 464 and 116 citations per year in 2021. The second most productive author is LAM H., who has 40 publications in the year 2021 and 6.66 citations in the field of artificial intelligence.

Country Scientific Production

Country Scientific Production

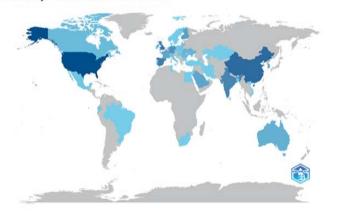


Figure 6: Geographical location of contributing countries.

The above figure shows that dark blue reflects the maximum production number from that specific country and visa-a-versa. This figure was created with a dataset from Scopus and WOS via R Studio. The U.S.A. is most significant in several publications on artificial intelligence in digital advertisement. The U.S.A. published 28 articles, the highest among all the countries. The second most considerable country is China, with 21 publications, and 3rd position is the U.K., with 19 publications on artificial intelligence in digital advertisement.

Country production Over the Time

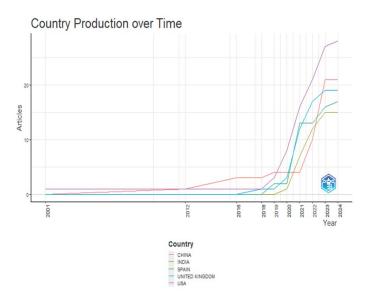


Figure 7: Country Production Over Tine

The above figure reveals the country's production from 2000-2023. China is the most productive country, which has published 71 publications during the period, and in the year 2023, it published 19 articles related to AI and digital advertisement. The 2nd position takes INDIA, which has published 50 articles and 15 articles in 2023. SPAIN country published 46 articles, and 16 were published in 2023.

Country Collaboration ma

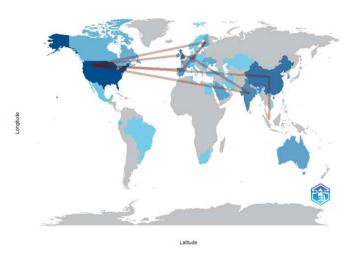


Figure 8: Country Collaboration map.

The above figure shows the country collaboration map. U.S.A. authors have 2 joint publications with other countries, including China, Finland, France, India, and the United Kingdom.

Most Citied Document

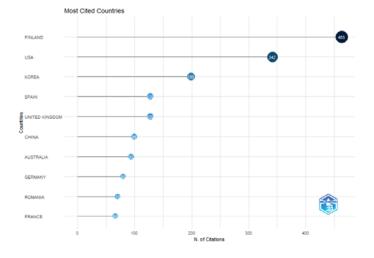


Figure 9: Most citied Document

The above figure revealed that most cited countries have published articles related to AI and digital advertisement. According to the information available, Finland was the most awarded country, with 483 citations and 1st rank among the top 10 countries. Further, the USA is 2nd cited country in AI and digital advertisement, with 342 citations. Most authors give contributions in this field. KOREA was getting 3rd position with 199 citations, and GEORGIA had the least number of citations in this field, which was 2.

Word cloud



Figure 10: Most Frequent Word

The magnitude of several topics and fields covered by digital advertisement and artificial intelligence. The above figure, formed using World Cloud from R software, Shows that the word that is more significant in size is the most frequent, i.e., artificial intelligence. The above figure also shows that other words, such as social media, big data, advertising, and online advertising, are the most frequently used words with maximum authors.



Conclusion

The field of advertising has undergone remarkable changes over the past few decades, and the integration of AI is set to facilitate even more transformative developments. This

article explores the research on AI in advertising through bibliometric analysis and a framework-based literature review. This study's time frame was 2000-2023, and data were collected from this year. Literature in the R studio was used to analyze the articles. Descriptive data analysis showed that the research in this area can be traced back to the last few decades. In this paper, the researcher performs bibliometric analysis and answers the six research questions, i.e., annual production, most productive journal, most relevant authors, author's production, country scientific production, and most cited document. The first publication on AI in a digital advertisement was in 2016, and the maximum number of publications was 40 in the year 2023. The average citation per document was 19.64. The Applied Marketing Analytics journal contributed the highest number of articles. Dwivedi Y is the most productive author and has 464 citations. Further, the U.S.A. is most significant in a number of publications on artificial intelligence in digital advertisement. The U.S.A. published 28 articles, which is the highest among all the countries. China is the most productive country, which has published 71 publications during the time period, and in the year 2023, it published 19 articles related to AI and digital advertisement. Finland was the most cited country, having 483 citations with 1st rank among the top 10 countries.

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