Journal Sensi

Print ISSN: 2461-1409
Online ISSN: 2655-5298

Research Article **Open Access (CC–BY-SA)**

Systematic Literature Review: The Role of Artificial Intelligence in Digital Marketing

Muhamad Yusup*[1], Sutarto Wijono[2], Danny Manongga[3], Irwan Sembiring[4], Sri Yulianto Joko Prasetyo[5], Theophilus Wellem[6]

[1]Universitas Raharja; Tangerang, Banten, (021) 5529592

[3,4,5,6] Universitas Kristen Satya Wacana, Salatiga, Jawa Tengah

e-mail: *[1]yusup@raharja.info, [2]sutarto.wijono@uksw.edu, [3]danny.manongga@uksw.edu, [4]irwan@uksw.edu, [5]sri.yulianto@uksw.edu, [6]theophilus.wellem@uksw.edu

Abstract

Artificial Intelligence has given a competitive advantage and can increment competition and benefit or Return on Venture in Computerized Showcasing. This article points to recognize diary sources related to the part of Fake Insights, explanatory strategies, applicabilities, and execution measurements on the part of AI in Computerized Promoting from 2015 to 2022. Based on the incorporation and prohibition criteria outlined, it was established that 8 things related to the article were distributed in 2015 and 2022. This article is organized utilizing the SLR strategy which is characterized as a preparation for recognizing, evaluating and evaluating the all accessible investigation to supply answers to four Research Questions. With Suggestions, and add up to of eleven investigation strategies, seventeen usage and nine execution measurements have been distinguished that can be utilized by analysts for future inquire about the part of Manufactured Insights in Computerized Promoting.

Keywords— *The Role of Artificial Intelligence, Artificial Intelligence, Data Science, Digital Marketing*

1. INTRODUCTION

Disturbance Advances such as Web of Things (IoT), Enormous Information Analytics (BDA) and Fake Insights (AI) have given appealing offerings and held a client base[1]. The rise of this innovation has given a competitive advantage [2] by encouraging item offerings and client benefit [3]. Different ways to win the competition to extend competition and increment benefit or Include (ROI) as stand for Return on Speculation in Advanced Promoting. A few studies have appeared that the best way utilized to extend the adequacy of advanced promoting procedures is to apply Counterfeit Insights to the industry nowadays [4][5]. More particularly, past research has been carried out and portrayed the part of Information Science within the Computerized Showcasing [6] and the Part of Machine Learning within the Advanced Showcasing [7].

Counterfeit Insights (AI) could be a broadly utilized innovation to assist organizations track real-time information to analyze and react rapidly to client needs. [8]. Scholastics and Practitioners believe that Manufactured Insights is our future, where its application isn't restricted as it were to computerized showcasing but other divisions such as pharmaceutical,

e-commerce trade, instruction, law, and fabricating. As organizations move forward toward Society 5.0, counterfeit insights and other rising advances advance in parallel. As of now, everybody can interact with different Artificial Intelligence applications to back day by day exercises. For example, by employing a smartphone to rummage around for substance with discourse acknowledgment, filling within the calendar with Siri, utilizing the programmed email sifting highlight, and so on. Businesses can robotize commerce forms by learning experiences from the past and producing shoppers and advertise bits of knowledge through program-based algorithms[9]. Manufactured Insights Advances such as Machine Learning (ML), Deep Learning, and Normal Dialect Handling (NLP) prepare machines to handle Enormous Information to create Advertise Insights [9]. For this reason, the part of Counterfeit Insights within the Advanced Promoting field should be considered encouraged.

2. RESEARCH METHODOLOGY

2.1 Review Method

The strategy utilized for the writing survey on The Part of Counterfeit Insights in Computerized Showcasing is to utilize a Orderly Writing Survey (Systematic Literature Review / SLR) [10]. SLR is right now an built up audit strategy, particularly within the field of Fake Insights, to distinguish, evaluate, and decipher all available investigate prove to supply particular investigate answers[11].

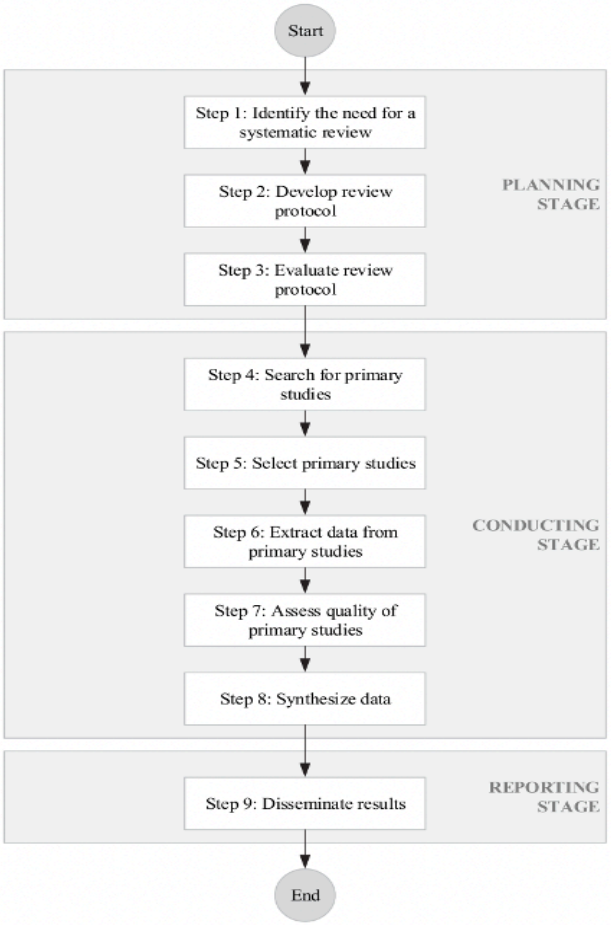

Figure 1 Systematic Literature Review Step

In Figure 1, SLR is carried out in three stages: counting the arranging arrange, conducting arrange, and detailing arrange. The Arranging arrangement incorporates Step 1: Distinguish the requirement for an orderly survey, at that point Step 2: Create an audit convention, and Step 3: Assess a audit convention. The Conducting Organize incorporates Step 4: rummage around for essential ponders, step 5: select essential considers, step 6: extricate information from essential considers, step 7: Evaluate the quality of essential thinks about, step 8: synthesize information, at that point Step 4 comprises of Step 9 dispersed comes about.

2. 2 Research Question

As appeared in Figure 1, SLR is carried out in three stages. At that point an Inquire about Address (RQ) is set to keep the survey centered. The RQ was planned with the Populace, Mediation, Comparison, Results, and Setting (PICOC) criteria of the investigate address

Table 1 Summary of PICOC

No	Summary of PICOC		
	Concept	***Definition***	***About***
1	Population	The inquire about work around the part of Counterfeit Insights in Computerized Showcasing	Fake Insights AND Advanced Showcasing
2	Intervention	Existing strategies utilized to address the issue recognized	The Part of IA, models, strategies, system, execution measurements
3	Comparison	Procedures differentiate the intercession utilize to degree the part of AI in Computerized Promoting	n/a
4	Outcomes	Degree to get to the information and crevices within the chosen distributions on the part of AI in Advanced Promoting	The Part of IA, models, strategies, system, execution measurements
5	Context	The specific settings of regions of the population	Ponders in the scholarly community and industry

The inspiration tended to investigate questions by this writing audit that appeared in Table 2.

Table 2. Research Question on Literature Review

ID	***Research Question***
RQ1	Which diary is the foremost critical of Manufactured Insights (AI) in advanced showcasing diary?
RQ2	What are the strategies for dissecting the part of Fake Insights (AI) in computerized showcasing?
RQ3	What are the applicabilities of the AI Part in Advanced Showcasing?

RQ4	What are the execution measurements for the part of AI in advanced promoting?

To reply the three questions over, SLR is carried out based on the distributions accessible in logical databases, to be specific Scopus and Semantic Researcher, at that point decide the look string concurring to the taking after steps: 1). Distinguishing proof of look terms from PICOC, particularly from Populace and Mediation, 2). Recognize the look term from the inquiry about address, 3). Distinguish look terms from the title, theoretical and suitable catchphrases. 4). Distinguish equivalent words, elective spellings, and antonyms of look terms. 5). The look string development employments look terms that are recognized as AND and OR Booleans. The taking after string is utilized for looking:

(demonstrate OR strategy OR system) AND (Counterfeit Insights OR Information Science OR Machine Learning) AND (Advanced Promoting)*

To look on Semantic Researcher utilize the look string without AND an OR Boolean but utilize the taking after watchwords:

model, method, framework, Artificial Intelligence, Data Science, Machine Learning, Digital Marketing

The look was restricted by the year of distribution, to be specific distributions from 2015 to 2022. Two sorts of distributions were utilized, specifically logical diary papers and conference procedures. Look is restricted to articles distributed in English as it were.

2. 3 Study Selection

To choose the most think about, consideration, and avoidance criteria were chosen. These criteria appear in table 3.

Table 3 Inclusion and Exclusion Criteria

Inclusion Criteria	Thinks about industry and scholastic utilizing little and huge scale information sets.
	Thinks about examining and comparing demonstrate within the part of AI in Computerized Promoting
	For things that have a both the diary and conference form will be included.
Exclusion Criteria	Considers examining the part of AI in Computerized Showcasing, strategies, system, and execution measurements in a setting other than the part of AI in Advanced Promoting
	Thinks about not composed in English

After getting the metadata, the Mendeley computer program was utilized. Mendeley is utilized to store and handle look comes about for logical articles. The nitty gritty look handle and the number of considers recognized in each stage are appeared in Figure 2.

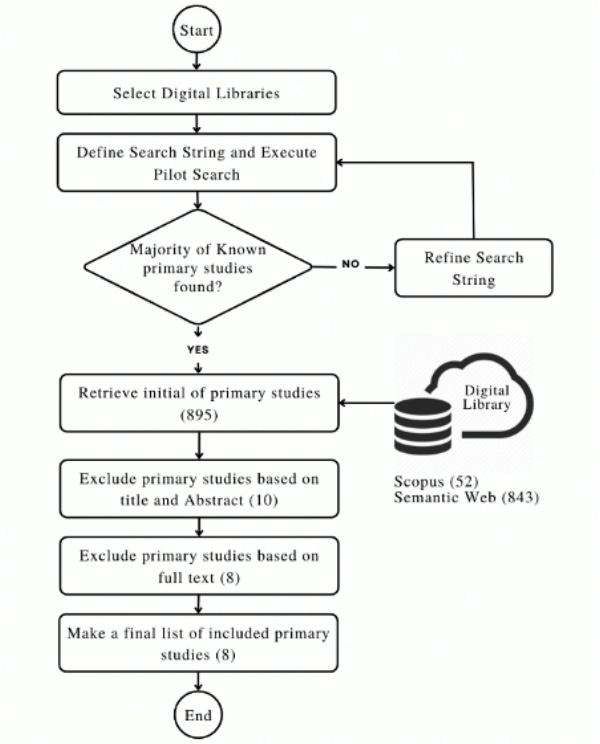

Figure 2 The Detailed Search Process

Based on the essential things about looks comes about getting eight essential considerations. Moreover, the complete content of the eight essential considerations will be analyzed to discover more around The Part of AI in Computerized Promoting. In expansion to the consideration and exclusion criteria, the quality of the most ponder, its pertinence to the inquire about explanation, and the likeness of the think about were considered, for example, Information Science and Machine Learning were included within the incorporation criteria. Ponders with comparative titles by the same creator in several diaries have been expelled from the list.

3. RESULTS AND DISCUSSION

3. 1 Significant Journal Publications

Within the writing survey, there are eight fundamental ponders that analyze The Part of Manufactured Insights in Computerized promoting. The look comes that numerous thoughts related to The Part of Manufactured Insights in Advanced showcasing will be conducted in 2021 and this shows that inquiry about within the field of The Part of Manufactured Insights is still pertinent and proceeds to develop nowadays.

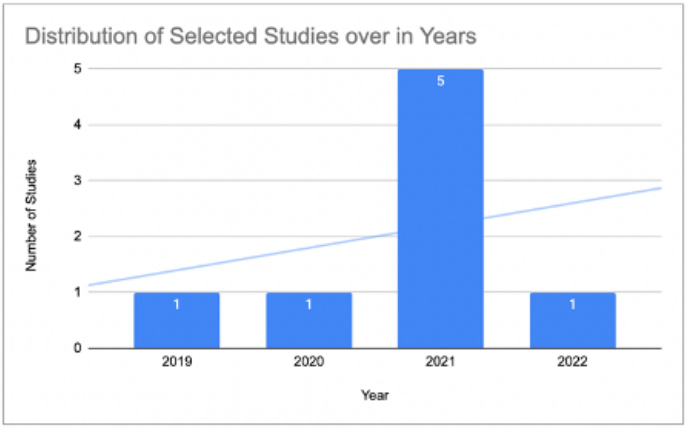

Figure 3 Distribution of Selected Studies Over in Years

Table 4 Author Journal Publications

Author	***Journal Publications***
A. Mikolasik [12]	IEEE Access
D.L. Olstand[13]	Current Developments in Nutrition
M.S. Ullal [7]	Sage Open
J. R. Saura [6]	Journal of Innovation and Knowledge
E. Mogaji [14], P. Van Esch [15]	Australasian Marketing Journal
Z. Lai [16]	Journal of Physics: Conference Series
T. Avudaiappan[17]	International Journal of Advanced Science and Technology

Based on Figure 3, the essential thing about look comes about displayed in table 4 found eight significant articles within the precise Writing Audit.

Table 5 appears the Scimago Diary Rank (SJR) and Category Q (Q1-Q4) values from the foremost critical diary The Part of Manufactured Insights in Computerized promoting. Diary distributions are sorted concurring to their SJR esteem.

Table 5 Scimago Journal Rank (SJR) of Selected Journals

No	***Journal Publications***	***SJR***	***Q Category***
1	IEEE Access	0.92	Q1
2	Current Developments in Nutrition	0.77	Q2
3	Sage Open	0.40	Q2
4	Journal of Innovation and Knowledge	0.91	Q2
5	Australasian Marketing Journal	1.06	Q2
6	Journal of Physics: Conference Series	0.21	Q4
7	International Journal of Advanced Science and Technology	0.10	Q4

3. 2 Methods used for analyzing the role of Artificial Intelligence in Digital Marketing

As appeared within the table underneath, there are eleven strategies utilized to analyze the part of Fake Insights in Advanced Showcasing, counting:

Table 6 Type of Analysis

No	***Type of Analysis***
1	Descriptive Statistics
2	Bayes Rule
3	Method of Least Square
4	Linear Regression
5	Logistic Regression
6	Artificial Neural Network
7	Multivariate Analysis
8	Maximum Likelihood Estimate
9	Discriminatory Analysis
10	Information Theory
11	Artificial Intelligence

The Eleven strategies [6] utilized to analyze the part of Counterfeit Insights in Computerized Promoting are depicted as takes after:

Insights in Computerized Showcasing are depicted as taken after: These Expressive Measurements are utilized to summarize quantitatively the highlights of a data set or information set. Clear measurements incorporate measures of central propensity, number juggling cruelly, or measures such as fluctuation or extent. The Bayes Run the show is drawn to portray the likelihood of an occasion. It is based on information of the conditions that may lead to that occasion. The strategy of slightest squares makes it conceivable to discover the most excellent hypothetical show consisting of factors or developments that fit the information set and permits quantitative approval. Straight Relapse was utilized to demonstrate the relationship between scale and investigation factors. In expansion, it is called different straight relapse when there's more than one investigation variable in direct relapse. Calculated Relapse could be a relapse investigation utilized to anticipate categorical factors. This categorical variable can be advanced separated into more categories. It is utilized as a general rule for modeling the likelihood of an occasion and its constituent variables. Counterfeit Neural Organize may be a self-learning framework comprising interconnected hub neurons that have input and yield. Multivariate investigation is an explanatory show that centers on different examinations of data collected from more than one subordinate variable. The multivariate examination includes the investigation of factors and the relationships between them. Most extreme Probability Gauge may be a strategy for assessing factual parameters in a perception. The most elevated likelihood for the evaluated parameter being analyzed. The biased examination is known as classification or design acknowledgment (closest neighbor demonstrates). It naturally recognizes designs or regularities in information sets and is broadly utilized in ponders centering on DM or KDD. Data hypothesis is utilized to analyze and think about the evaluation and communication of data

to discover the limits of communication handling. And Counterfeit Insights is centered on mimicking human insights by machines. In this regard, Fake Insights alludes to the utilization of machines that naturally center on machine learning and problem-solving.

3. 3 Applicabilities of The AI Role in Digital Marketing

Based on the look from different past considerations, there are Seventeen applicabilities [6] of the AI Part in Advanced Showcasing counting Analyzing Client Create Substance (UGC) Optimize Clients Inclinations is an examination of substance broadly distributed by clients on social media and advanced stages. Cases are tweets, surveys, comments, offers, metadata, likes, and so on. Online Client Behavior Following is utilized for optimizing client inclinations in items and administrations that can be customized based on huge information examination that contains data about client inclinations. Following Social Media is utilized to track and foresee customer behavior on advanced channels. By knowing this, companies can expect promoting and promoting activities and superior get it clients wants. Commentary/Interaction is utilized to track client reactions and intelligence within the advanced biological system. Based on the results, marketers can send more significant messages. Optimize Stock levels in e-commerce Websites, is an optimization of stock on e-commerce websites to oversee data and items and administrations to expect deals and item requests from providers in development. Examination of online deals information is an examination to discover designs that clarify patterns, current request, and client intrigued in certain items. Presenting modern items. With this showcase investigation, one can discover designs that make no sense to unused items being offered to a segment that's as of now soaked with supply. Analyzing item proposals and audits, and analyzing patterns on social media to dodge a company's notoriety, emergency or social developments that require the company's consideration. Personalizing a customer's online encounter is an investigation of buyer reviews and suggestions to discover and recognize the most designs and characteristics of items, administrations, or client benefits. Building Recommender frameworks are utilized to improve customers' shopping involvement to offer personalized encounters based on data from past clients who have gone by the site. Degree and anticipate clicks online (social and paid advertisements) is the expectation of client clicks on web pages and social systems. Based on this data, companies can increment the productivity of their advertisements and increment the perceivability of impressions and clicks, moreover known as Click-Through Rate (CTR) Degree and Anticipate Client Behavior to anticipate how clients will carry on to offer or maintain a strategic distance from a issue some time recently buying, for illustration sending emails in an mail showcasing campaign to offer extra items and subsequently increment benefit. Make strides Client Involvement (UX) to move forward client involvement in terms of the realistic and visual plan of web pages, versatile applications, and others that center on âuser-friendlinessâ. Analyze real-time information Recognize online communities The objective is to distinguish online communities and powerful individuals and their pioneers. Analyze users' thought and dependability to supposition pioneers and their messages. Recognizing fake News is to recognize fake substance about the company or shared promoting messages; elective terms are "fake news' ' or "profound fakes".*3. 4 Performance Metrics for The Role of AI in Digital Marketing*

Execution measurements field [18] to Degree The Victory of Part AI in Advanced Promoting incorporate:Table 7 Performance Metrics Field:

Table 7 Performance Metrics Field

No	*Indicator*	*Descriptions*
1	Reliability	Could be a metric of the exactness and completeness of preparing a information set related with its utilize
2	Accuracy	Moreover called accuracy, indicates the quality and exactness of the hit demonstrate or strategy
3	Precision	Accuracy, too known as Positive Prescient Esteem (PPV), may be a metric that measures the significance and victory of a method's approach in a database
4	Validity	A degree that shows whether the information bolster the comes about and conclusions gotten in a genuine and exact way.
5	Consistency	Assesses whether the values spoken to in information from one information set are steady with values spoken to in information from another information set at the same point in time
6	Recall	Moreover called affectability, for the most part alludes to the number of adjust comes about separated by the number of disposed of values
7	Sensitivity	In some cases alluded to as the likelihood of location or inspiration rate, it measures the extent of positive values or focuses recognized in a information set
8	Specificity	A metric that assesses the genuine negative prescient characteristics of a variable in a category in a information set
9	Prevalence	Alludes to the extent of a populace with certain common characteristics over a certain period of time

4. CONCLUSION

The conclusion ought to clearly demonstrate the benefits, preferences and drawbacks, as well as the plausibility of assisting advancement.

The conclusion may be in passages, but ideally within the shape of focus by utilizing numbering or bullet.

This writing audit points to distinguish sources of diaries related to the part of Counterfeit Insights, expository strategies, applicabilities, and execution measurements on the Part of AI in Advanced showcasing from 2015 to 2022. Based on the consideration and avoidance criteria planned, it was found that eight things related to articles distributed in 2015

and 2022. This article was arranged utilizing the SLR strategy which is characterized as a preparation for distinguishing, surveying, and deciphering all available inquiries about prove to supply answers to four Inquire about Questions. The suggestions of this have been recognized in an add up of eleven explanatory strategies, seventeen applicabilities, and nine execution measurements that can be utilized by analysts to encourage inquire about on The Part of Fake Insights in Advanced Promoting. The confinement of this study is the constrained number of databases utilized to gather articles.

REFERENCES

[1] M. Anshari, M. N. Almunawar, S. A. Lim, and A. Al-Mudimigh, "Customer relationship management and big data enabled: Personalization & customization of services," *Appl. Comput. Informatics*, vol. 15, no. 2, pp. 94–101, 2019.

[2] T. C. Stratopoulos and V. X. Wang, "Estimating the duration of competitive advantage from emerging technology adoption," *Int. J. Account. Inf. Syst.*, vol. 47, p. 100577, 2022.

[3] F. Hu, H. Li, Y. Liu, and T. Teichert, "Optimizing service offerings using asymmetric impact-sentiment-performance analysis," *Int. J. Hosp. Manag.*, vol. 89, p. 102557, 2020.

[4] D. Dumitriu and M. A.-M. Popescu, "Artificial Intelligence Solutions for Digital Marketing," *Procedia Manuf.*, vol. 46, pp. 630–636, 2020.

[5] R. Sarath Kumar Boddu, A. A. Santoki, S. Khurana, P. Vitthal Koli, R. Rai, and A. Agrawal, "An analysis to understand the role of machine learning, robotics and artificial intelligence in digital marketing," *Mater. Today Proc.*, vol. 56, pp. 2288–2292, 2022.

[6] J. R. Saura, "Using data sciences in digital marketing: Framework, methods, and performance metrics," *J. Innov. Knowl.*, vol. 6, no. 2, pp. 92–102, 2021.

[7] M. S. Ullal, I. T. Hawaldar, R. Soni, and M. Nadeem, "The Role of Machine Learning in Digital Marketing," *SAGE Open*, vol. 11, no. 4, 2021.

[8] N. Wirth, "Hello marketing, what can artificial intelligence help you with?," *Int. J. Mark. Res.*, vol. 60, no. 5, pp. 435–438, 2018.

[9] T. Davenport, A. Guha, D. Grewal, and T. Bressgott, "How artificial intelligence will change the future of marketing," *J. Acad. Mark. Sci.*, vol. 48, no. 1, pp. 24–42, 2020.

[10] R. S. Wahono, "A Systematic Literature Review of Software Defect Prediction: Research Trends, Datasets, Methods and Frameworks," *J. Softw. Eng.*, vol. 1, no. 1, pp. 1–16, 2015.

[11] M. M. Mariani, I. Machado, V. Magrelli, and Y. K. Dwivedi, "Artificial intelligence in innovation research: A systematic review, conceptual framework, and future research directions," *Technovation*, no. August, p. 102623, 2022.

[12] A. Miklosik, M. Kuchta, N. Evans, and S. Zak, "Towards the Adoption of Machine Learning-Based Analytical Tools in Digital Marketing," *IEEE Access*, vol. 7, pp. 85705–85718, 2019.

[13] D. L. Olstad *et al.*, "Development of an Artificial Intelligence System to Monitor Digital Marketing of Unhealthy Food to Children: Research Protocol," *Curr. Dev. Nutr.*, vol. 6, no. Supplement_1, p. 1151, 2022.

[14] E. Mogaji, T. Soetan, and T. Kieu, "The Implications of Artificial Intelligence on the Digital Marketing of Financial Services to Vulnerable Customers," *Australas. Mark. J.*, vol. 29, May 2020.

[15] P. van Esch and J. Stewart Black, "Artificial Intelligence (AI): Revolutionizing Digital Marketing," *Australas. Mark. J.*, vol. 29, no. 3, pp. 199–203, Aug. 2021.

[16] Z. Lai and L. Yu, "Research on Digital Marketing Communication Talent Cultivation in the Era of Artificial Intelligence," *J. Phys. Conf. Ser.*, vol. 1757, no. 1, p. 12040, 2021.

[17] T. Avudaiappan, K. Abirami, M. Dharani Lakshmi, and R. B. Karunyaa, "Analysis of digital marketing dataset using machine learning algorithm," *Int. J. Adv. Sci. Technol.*, vol. 29, no. 7 Special Issue, pp. 1375–1386, 2020.

[18] J. R. Saura, "Using Data Sciences in Digital Marketing: Framework, methods, and performance metrics," *J. Innov. Knowl.*, vol. 6, no. 2, pp. 92–102, Apr. 2021.