

THE ROLE OF BIG DATA IN MARKETING 5.0 : A SYSTEMATIC LITERATURE REVIEW



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ABSTRACT

In the context of marketing, society 5.0 has major implications that fundamentally change how businesses operate and interact with consumers. In marketing 5.0, the use of big data is crucial; technological developments that influence consumer behavior and increasing market competition necessitate an analysis of consumer habits to facilitate marketers in advertising their products. This research employs the Systematic Literature Review (SLR) method using the Watase Uake application to search for articles published from 2021 to 2024. Previous research indicates that big data and related technologies significantly impact marketing and business strategies, enhancing sales prediction accuracy, boosting company profits, and generating innovative digital content.

Keywords: Bigdata; Digital Marketing; Systematic Literature Review

Received : 02-05-2024

Revised : 22-10-2025

Approved : 31-10-2025

Published : 01-11-2025



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INTRODUCTION

According to its definition, Marketing 5.0 is the integration of marketing and technology designed to simulate human thinking in creating, communicating, delivering, and enhancing value for all consumers (Kotler et al., 2022). Marketing Society 5.0 represents a transformative vision of society where digital technologies are integrated into every aspect of daily life to address social challenges and improve human well-being (Wakil et al., 2022). Society 5.0 seeks to utilise advanced technologies such as artificial intelligence, the Internet of Things (IoT), big data analytics, and robotics to create a more connected, intelligent, and sustainable society. In the context of marketing, Society 5.0 has fundamental implications for the transformation of business operations, the way of interacting with consumers, and the process of value creation (Judijanto et al., 2023). One of the characteristics of Marketing 5.0 is the use of data and analysis to gain insight into the behaviour and references of consumers or clients. With the use of technological assistance, it will be easier to determine market segmentation and design more effective marketing strategies (Batakor, 2024). The utilisation of digital technology involving augmented reality, chabots, and virtual assistants will create engaging experiences for the right target consumers (Garaus, 2025).

Marketing 5.0 is the latest evolution of marketing theory and practice, characterized by the integration of advanced technologies into marketing tactics such as artificial intelligence, the Internet of Things, and big data analytics (Wardani, 2025). Additionally, changes in consumer behavior characterize this new marketing era as consumers gain greater power from digital technologies and the extensive access to information about goods and services (Kotler et al., 2022). One of the most important advancements brought about by Marketing 5.0 is the increased use of modern technology integrated into marketing strategies (Bakator dkk, 2023). Artificial intelligence (AI) assists individuals in building a balanced environment where humans and machines work together to create revenue and sales in marketing effectively and efficiently (Garaus, 2025). AI can also monitor consumer sentiment based on input obtained from customers, whether through product reviews, social media, or other customer interactions (Fedorko et al., 2022).

The massive development of technology in society has given rise to a more complete collection of information. People will be more involved in the digital world and their activities will be more efficient (Muttuqin dkk, 2021). Information appears every day, including in the economic field. Technologies for processing and analysing data are important in this context. The term 'Big Data' represents a method of processing large amounts of information that makes it possible to analyse it in a distributed manner. Product placement on the internet is nowadays an inseparable part (Molina, 2024). This can change sites, social network pages, and profiles on Yndex.Market or Youtube channels. All these components are part of Digital Marketing. The challenges of the current economic conditions have prompted companies to review their advertising campaigns and ways of online promotion, taking into account digital marketing technologies (Nazarov, 2019). In marketing 5.0 the use of big data driven is important, technological developments that change consumer behaviour closer to technology and increasing market competition require an analysis of consumer habits to make it easier for marketers to advertise their products (Wang, 2024).

Several previous studies have shown that big data plays a significant role in supporting marketing strategies. Most studies focus on specific sectors that use technology as a primary sales tool. Examples include e-commerce (Zhou & Zhou, 2022), insurance (Wu & Liu, 2022), and digital content marketing (Nixon et al., 2024). However,

there is likely still a lack of comprehensive understanding of how big data contributes to the Marketing 5.0 concept, which integrates technology and humans simultaneously. Previous research also has not provided a comprehensive overview of big data analytics that support consumer interaction, decision-making, and marketing automation. This gap requires a systematic literature review to map current trends, methods, and research directions on the implementation of Big Data in Marketing 5.0.

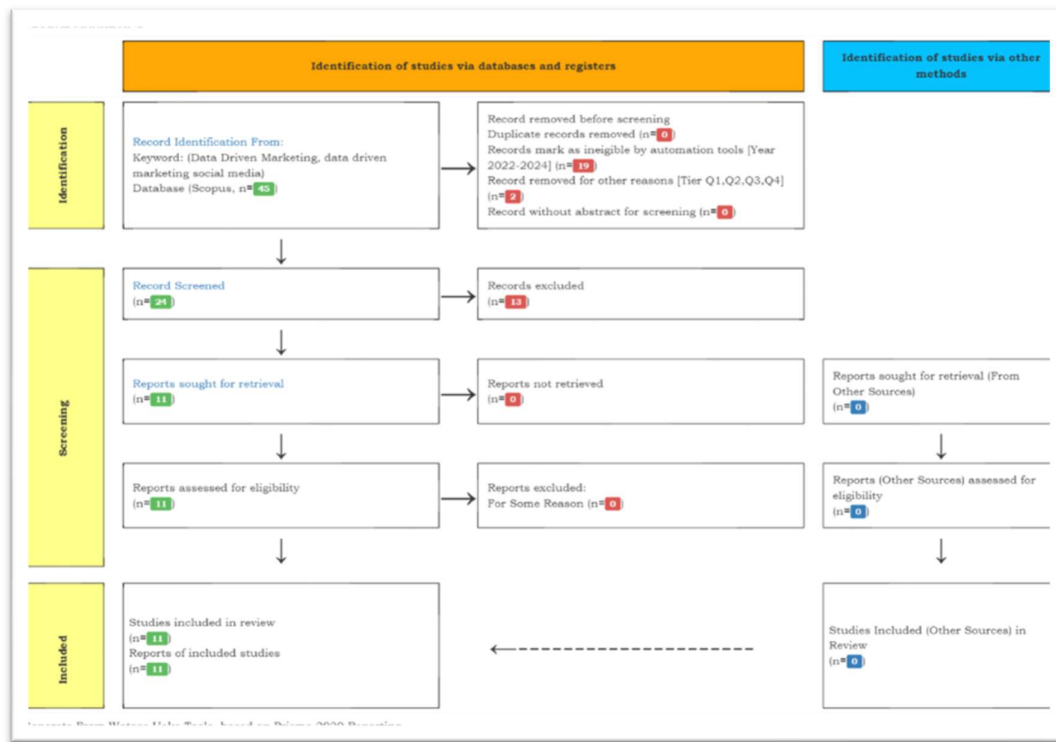
This study addresses these gaps with three questions: (1) How is big data used in different marketing sectors within Marketing 5.0? (2) How does big data affect marketing performance and consumer engagement? (3) What challenges and opportunities remain for using big data in Marketing 5.0?

This research aims to systematically review studies discussing the role of big data in Marketing 5.0. It focuses on how technology can improve marketing performance, consumer engagement, and digital innovation. The research also aims to identify trends, challenges, and research opportunities related to big data in future Marketing 5.0 strategies.

METHOD

This research uses the Systematic Literature Review (SLR) method. This method is used to collect secondary data collected from research results related to mathematical communication skills. SLR consists of three main stages, namely planning the review, conducting the review, and reporting the review (Kitchenham & Charters, 2007). In the review implementation stage, data is identified, extracted, analysed and synthesised. In the reporting stage, a report is written to disseminate the findings of the literature review (Xiao & Watson, 2019).

In this study, the application used for literature review of reference scientific articles is the Watase Uake site from Google Scholar database, with a search for articles published from 2021 to 2024. The search stage is to conduct an initial search with the keyword "Data Driven Marketing" then 45 articles appear, then at the screening stage 24 articles are obtained. Of the 24 articles, 11 articles were obtained that were in accordance with the theme of this research, while 13 journals did not match the theme of this research. Figure 1 shows the article screening process until 11 articles relevant to research on the role of big data in marketing 5.0 were found.



Source: Data Analyzed (2024)

Figure 1
PRISMA Reporting by Watase Uake

RESULTS AND DISCUSSION

Table 1 contains information on 11 articles by Watase Uake that are relevant to the theme of Data Driven Marketing.

Table 1
Literature Review

No.	Author	Title	Year	Citation	Publisher
1	Xiaofeng Zhou and Ying Zhou	Research on the Innovative Marketing Model of E-Commerce Platform Driven by Big Data in the Era of Network Economy	2022	0	Hindawi
2	Xian Wu and Huan Liu	Evaluation and Selection of Insurance Marketing Schemes Driven by Multi-source Big Data	2022	1	Hindawi
3	Lyndon Nixon, Konstantinos Apostolidis, Evlampios Apostolidis, Damianos Galanopoulos, Vasileios Mezaris, Basil Philipp, Rasa Bocyte4	AI and data-driven media analysis of TV content for optimised digital content marketing	2024	0	Springer

No.	Author	Title	Year	Citation	Publisher
4	Xiaoqing Lyu, Faxian Jia, Bingqian Zhao	Impact of big data and cloud-driven learning technologies in healthy and smart cities on marketing automation	2023	2	Springer
5	Stefan Sleep, Prachi Gala, and Dana E. Harrison	Removing silos to enable data-driven decisions: The importance of marketing and IT knowledge, cooperation, and information quality	2023	14	ScienceDirect
6	Jorge Xavier and Winnie Ng Picoto,	Regulation of data-driven marketing and management theory: bibliometric analysis, systematic literature review and research agenda	2023	0	Emerald Insight
7	Arun A. Elias	The 'dark side' of data-driven marketing: a system's thinking analysis	2022	8	Taylor and Francis
8	Jose Ramon Saura, Daniel Palacios-Marques & Domingo Ribeiro-Soriano	Digital marketing in SMEs via data-driven strategies: Reviewing the current state of research	2021	79	Taylor & Francis
9	Ahmed Timoumi, Manish Gangwar, Murali K. Mantrala	Cross-channel effects of omnichannel retail marketing strategies: A review of extant data-driven research	2022	86	ScienceDirect
10	Senyu Xu, Huajun Tang, Yuxin Huang	Decisions of pricing and delivery-lead-time in dual-channel supply chains with data-driven marketing using internal financing and contract coordination	2022	4	Emerald Insight
11	Belem Barbosa, Jose Ramon Saura, Senka Borovac Zekan, Domingo Ribeiro-Soriano	Defining content marketing and its influence on online user behaviour: a data-driven prescriptive analytics method	2023	37	Springer

Source: Data Analyzed from Google Scholar (2024)

In research by Zhou & Zhou (2022) which discusses marketing model innovation on e-commerce platforms using big data. The novelty of this research in the context of data-driven digital marketing lies in its ability to accurately forecast future sales with the aim of being able to analyse profits and the sustainability of the company from the profits earned, considering that the most important thing of business is the achievement of profits. This research employs cluster analysis using the K-Modes algorithm to analyze information from past datasets of small and medium-sized e-commerce businesses in order to generate accurate sales forecasts for the future. The data extraction process is conducted using the knowledge graph technique applied to sales data accumulated from historical to recent periods. Next, a divisional clustering algorithm known as the K-Modes algorithm is employed to address the problem of categorical attribute clustering. The data taken, namely, the number of orders, reviews, and product information from 3 August 2019 to 30 April 2020 and selected 1,703 e-commerce that has 7 types of products or more. From the data obtained, the main factors affecting sales are, the higher the market volume value, the higher the number of sales. The number of new reviews has a great impact on e-commerce, so it must prepare a reasonable marketing strategy to reduce bad reviews, because the first thing consumers search for when entering e-

commerce is the item review category. Marketing strategy innovation aimed at increasing positive comments serves as an added value for e-commerce businesses with a limited number of products.

According to the study by Wu & Liu (2022), the prediction error is approximately 2.38% and the linear correlation is greater than 0.96 when using data mining technology and neural network methods in insurance business marketing schemes. A big data-based approach combined with insurance promotion is carried out with the aim of developing new customers, increasing the motivation of existing customers to engage in more activities, and retaining existing customers to encourage customers to continue to carry out insurance plans. The data-driven method used in this study includes historical data on the amount of insurance, type of insurance, and insurance time on new customer data, potential customer data, and old customer insurance data as a multi-source data source. Then the data is classified using the clustering method according to the strength of the weak correlation. The classified data will be used to make predictions of insurance coverage trends. The data-driven approach in this study is capable of automatically identifying relationships (correlations) among data and generating predictions that align with the specific patterns or characteristics of insurance business data. In this way, the analysis process does not need to be conducted manually, thereby saving a significant amount of time and labor costs that are typically required for traditional analysis and calculations. Therefore, the integration of technology and marketing knowledge in this study demonstrates higher accuracy in attracting new customers and retaining existing ones in the insurance business.

In the study Nixon et al. (2024) stated that using AI and big data in the digital content marketing process produces new and innovative digital content that meets the needs of today's online media organisations, where content is transient following trends, malleable and changeable, and ubiquitous. The digital content marketing workflow starts from first, identifying trending topics using predictive analytics through the process of monitoring and analysing millions of data points, web pages, social media posts and blogs. Secondly, selecting videos for content creation that are relevant to the selected topics through online data. Third, summarising the videos to be published on social media through the AC-SUM-GAN model method. The new video summaries are used to create media assets from longer videos into short-form topic-focused summaries optimised for publication on social media. Overall the big data and AI-based media analytics capabilities developed by Retv can create a more efficient digital content creation workflow where the same content can be republished semi-automatically in different forms across different digital channels at optimal publication times for each channel.

Lyu et al.'s (2023) study stated that using big data and cloud-based learning technology increased customer retention by 23% over other algorithms such as decision tree, random forest, Bayesian learning and sales also increased higher than other algorithms in the retail industry for online sales. In order to optimize the delivery of advertising content in real-time and realize the right marketing process by integrating individuals across multiple potential platforms, big data is used in conjunction with BP neural network algorithm technology. This allows potential customers to be contacted again in an efficient manner, ultimately leading to increased purchasing power. In addition, the big data used in this study can explore and understand the needs of consumer needs and recommend consumer needs in a short time when consumers search for products online, so as to affect the speed of response and consumer satisfaction and create consumer interaction value. This shows that big data and cloud drives have an impact on automated marketing in the retail industry in the online sales process.

Sleep et al.'s (2023) research related to the importance of knowledge, cooperation and information quality in the fields of marketing and IT, this study discusses how marketing and IT business knowledge at the executive level affects decision making, how internal and external data can be combined and transformed to inform strategic decisions from a marketing and IT perspective and analyse the impact of information quality and cooperation on each function and company results. This study indicates that business knowledge has a direct influence, meaning that leaders with business knowledge in the field of information technology (IT) are more capable of making data-driven decisions. Conversely, business knowledge in the field of marketing does not show a direct influence on data-driven decision-making. This implies that leaders who understand marketing strategies but lack the ability to analyze and interpret consumer data cannot fully utilize the potential of data to make efficient decisions that support company operations. Leaders with expertise in integrating data and technology into business planning tend to have greater confidence, resulting in more effective decisions that enhance innovation and business profitability.

In the study of Xavier & Picoto (2023), they emphasize that the success of data-driven marketing depends on maintaining a balance between the utilization of technology and compliance with personal data protection regulations. The implementation of data-driven marketing requires substantial investment in human resources, technological infrastructure, information systems, and data analysis expertise. This necessitates that companies establish a strong foundation in technology and data management to ensure that technology-based marketing operates efficiently. In this study, marketers are confronted with technical, ethical, and political challenges in managing consumer data, including data security, consumer privacy, and adherence to prevailing regulations. The study also found that companies that successfully master data-driven marketing processes tend to achieve higher levels of customer engagement, as they are able to deliver more personalized and relevant experiences. However, regulatory changes—particularly the enforcement of the General Data Protection Regulation (GDPR) in 2018—have created new challenges for businesses. This regulation restricts the use of personal data for marketing purposes, requiring companies to adapt their strategies and technologies in order to remain legally compliant without compromising the effectiveness of their data-driven marketing efforts.

The fragmentation of the results of this study identified 3 main clusters and 11 management theories that formulated 18 questions for future research.

- Cluster 1 - The balance between well-being and privacy.
This cluster highlights that the use of personal data provides significant benefits for companies. Utilizing customers' personal information enables businesses to customize products and services according to individual preferences and to implement differentiated pricing based on customer profiles or purchasing behavior. However, behind these advantages lie issues of privacy and ethics. The use of personal data may violate privacy if conducted without consent or transparency, while price discrimination can be perceived as unfair when customers pay different prices for the same product. However, the studies in this cluster were not selected for discussion as no management theory could be identified in these studies.
- Cluster 2 - The importance of DDM for top management or The use of personal data and consumer interests.
This cluster explains that the implementation of Data-Driven Marketing (DDM) in marketing strategies based on measurable and objective analysis plays an

important role in decision-making by top management. The application of DDM must also be accompanied by ethical principles, respect for individual rights, environmental sustainability, and social well-being. Furthermore, this cluster highlights that DDM can transform the role of marketing — it is no longer viewed merely as an expense, but as a source of profit and innovation. Companies that are slow to adopt DDM will face competitive disadvantages

- Cluster 3 - Business models and the value of personal data.

This cluster indicates that personal data holds significant economic value and serves as a key element in developing new business models in the digital era. Users gain access to free services, while their personal data is collected by companies and utilized to generate profit

In research by Elias (2022) data-driven marketing has become a prominent strategic marketing approach, but is prone to complex challenges. Using the case of a university in New Zealand that uses data-driven marketing for its international marketing efforts in India, a system model was developed and intervention strategies were formulated to holistically address data-driven marketing challenges. Some of the challenges found were classified into three, namely ethical challenges, organisational challenges and technical challenges. Examples of ethical challenges could stem from reselling data, non-disclosure of values and goals and individual privacy. Organisational challenges include top management support, company decisions and data analysis capabilities. Meanwhile, technical challenges can include challenges from data collection, data analysis and data proliferation.

According to research by Saura et al. (2023), on data-driven strategies for digital marketing in SMEs, in order to optimize and assess the effectiveness of business models, SMEs need to apply data science techniques in a systematic and uniform way in order to minimize costs and maximize returns. In this research, there are seven ways data science techniques can be used to improve the digital marketing strategy of SMEs, namely: Identification of sales and purchase related factors, Product-klein interaction/knowledge/(re)search, Marketing potential and social media engagement/performance levels, Enterprise social networks, Improving knowledge-oriented social network related performance, Impact on performance outcomes, Network centrality analysis.

In the study by Timoumi et al. (2022) which discusses the cross-channel impact within retailers of omnichannel retail marketing strategies on (a) consumers' responses to their purchase journey, i.e. online and/or offline search, purchase intention, frequency, quantity, returns, loyalty, and (b) retailers' aggregate outcomes (e.g. sales, costs, profits, product returns) by channel and overall. Specifically, this study focuses on five strategies, namely: (1) the addition of online channels by offline retailers; (2) the addition or reduction of offline by online retailers; (3) the addition of mobile shopping channels (websites and/or apps) by offline and/or online retailers; (4) cross-channel integration strategies; and (5) retail marketing mix strategies.

The results of this study are that adding offline channels by online retailers will increase online channel sales as well as overall retailer sales, so if adding online channels usually increases the frequency and number of customer purchases as well as overall retailer sales in the long run. strategies for greater cross-channel integration generally have a positive impact on overall retailer performance, then online advertising has a positive impact on offline channel consideration and sales as well as overall sales of multichannel retailers.

Research conducted by Xu et al. (2023) discusses the role of Data Driven Marketing (DDM), the proportion of customer channel preferences, the CCR rate, the financing interest rate and the sensitivity of online lead times to pricing decisions and delivery lead times. it aims to maximise member profits and the supply chain as a whole. besides that it also discusses the coordination of producer profit-sharing contracts.

The finding in the study is that high quality Data Driven Marketing will reduce delivery lead times and will increase selling prices, meaning that high DDM quality can increase greater benefits with the availability of more accurate marketing so that producers or retailers can increase selling prices, this is in line with research (Cohen, 2018). In addition, good DDM quality can attract more customers with reduced delivery lead times because it is effective for increasing competitiveness through online channels. Qualified and optimised DDM can ensure the supply chain to get high profits in the centralised system. With the growth of big data analysis, there will be many commercial opportunities for supply chain members. Therefore, not only should they join the alliance, but also should choose the quality level of DDM so that both members can get higher profits through well-designed contracts.

Research conducted by Barbosa et al. (2023) aims to develop a relevant theoretical framework related to content marketing and identify the techniques of the main uses associated with its development. The very rapid development of social networks in the last decade has caused traditional marketing to adapt its main characteristics to the digital ecosystem, which is increasingly important for companies (Sánchez et al., 2022). The ease of access to the internet and social networks has made user habits manifest as a lifestyle for various generations, such as the digital natives and millennials. (Helal et al., 2018). Depending on the industry and company goals, it makes sense for companies to concentrate on developing a content marketing strategy that communicates corporate values and identity without performing commercial actions or direct sales, even though content marketing strategy has been used extensively over the past decades as a traditional marketing strategy where the generated content represents the brand in the new digital ecosystem. Furthermore, the research establishes a connection between the outcomes and the utilization of novel artificial intelligence methods to customize content according to user preferences and analyze user behavior.

The study's findings demonstrate that businesses should properly implement content personalization, particularly when utilizing AI-based methods to forecast user behavior. It must be made sure that these methods don't compromise user privacy or result in unpleasant experiences. Although content marketing techniques are an essential component of digital marketing strategies, when combined with big data or artificial intelligence algorithms, they have the potential to alter users' online behavior. This raises questions about how marketing strategies should be developed ethically in the digital age and about the necessity of developing marketing strategies for reasons other than profit and economics.

CONCLUSION AND SUGGESTION

From various previous research results, big data and this technology show a significant impact on marketing and business strategies. examples of these significant impacts can be seen from various perspectives, namely big data can improve the accuracy of sales predictions and increase company profits (Zhou & Zhou, 2022). In the marketing scheme for technology insurance businesses that use data mining and neural network methods, this is capable of providing accuracy and feasibility in predicting business insurance (Wu & Liu, 2022).

The use of big data can also be applied in various MSMEs. The use of big data in digital content-based marketing processes can produce new and innovative digital content in line with current online media needs (Nixon et al., 2024). The content created can be updated in real time and targeted at potential consumers, so that the use of big data encourages increased purchasing power (Lyu et al., 2023).

However, in order for big data to provide great benefits, it is important to apply data science techniques in a consistent and structured manner, because big data itself is also prone to various complex challenges such as ethical, organisational and technical challenges.

Based on the identified research gaps, objectives, and findings, future studies are encouraged to explore empirical validation of Big Data implementation in Marketing 5.0 through case studies or quantitative analyses, since most existing studies remain conceptual or descriptive. Further research may also examine the mediating and moderating roles of factors such as artificial intelligence capability, data governance, and consumer trust in strengthening the relationship between Big Data and marketing performance. In addition, considering the growing ethical and legal concerns surrounding the use of personal data, future studies should investigate regulatory and privacy aspects of data-driven marketing across different cultural or regional contexts. Researchers are also recommended to develop integrated frameworks that combine human-centric values with data-driven automation to reflect the essence of Marketing 5.0 as "technology for humanity."

Finally, it is suggested that future research expand the application of Big Data beyond commercial sectors such as education, public services, and creative industries to provide a broader understanding of how Big Data can enhance innovation and value creation in diverse fields.

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