Chapter 5

Algorithmic Biases and Injustice: Ethical and Practical Dimensions of Artificial Intelligence in Digital Marketing 🔓

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Abstract

Digital marketing is undergoing a profound transformation with the rise of artificial intelligence (AI) algorithms. These technologies process large datasets to enable personalized campaigns and automation, while simultaneously introducing ethical and practical challenges. This article praises AI's potential in marketing while examining the adverse effects of algorithmic biases, such as discrimination, loss of consumer trust, and risks to corporate reputation. A literature-based analysis reveals that biases stem from distortions in training data, shortcomings in design choices, and socio-cultural contexts. This leads to the exclusion or mis-targeting of specific groups in segmentation and targeting processes, creating unfairness in marketing strategies and acting as a catalyst for deepening societal inequalities. The study proposes solutions, including technical approaches (e.g., fair data processing techniques), ethical frameworks (e.g., transparency and accountability), and regulatory measures (e.g., international standards), offering a holistic framework for the responsible use of AI.

Introduction

Marketing, which is essentially the art and science of understanding consumer demands and developing strategic responses to these demands, has been redefined in the modern era with the impact of digital transformation. The collection and analysis of online data streams have radically changed the discipline. At the same time, AI algorithms have taken the capacity to individualise and mechanise marketing practices to an extraordinary level by processing large data pools - such as demographics, social media trails and purchase histories (Gupta, 2024). However, this technological leap has been

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marred by algorithmic biases based on sensitive attributes such as ethnicity, gender and age, which threaten not only marketing effectiveness but also principles of social justice (Pappadà & Pauli, 2022). This chapter aims to deconstruct the dual nature of AI in digital marketing - its productive potential and ethical vulnerabilities.

In segmentation and targeting processes, AI-induced biases lead to the systematic exclusion or disproportionate targeting of specific social clusters, which fuels consumer discontent and erodes institutional legitimacy (Bigman et al., 2023). Racial biases documented in some social media platforms' ad-targeting algorithms have triggered legal sanctions and public outcry as a concrete manifestation of this problem (McIlwain, 2023). In this context, the study focuses on three main questions: (1) How do algorithmic biases affect the functioning of digital marketing strategies? (2) In what ways do these biases put consumer trust and corporate reputation at risk? (3) What conceptual and practical solutions can be put forward for AI's ethical and responsible implementation? Based on a systematic review of literature published between 2015 and 2024 in Web of Science and Scopus databases, this research rigorously investigates the origins, effects, and ways to mitigate biases.

The proliferation of AI in digital marketing has increased operational efficiency and made systemic flaws and societal consequences sharply visible. Biases in educational data, inadequacies in design decisions, and algorithms shaped by socio-cultural contexts risk perpetuating discriminatory practices; for example, personalised pricing models can reinforce inequalities by disadvantaging low-income consumers (Rathnow, Zeller, & Lederer, 2024). Such practices call into question basic marketing principles such as fair competition and consumer welfare; at the same time, they jeopardise the long-term sustainability of businesses by eroding consumer trust - the cornerstone of brand loyalty (Akter et al., 2022). By scrutinising the tension between the technical capabilities of AI and its ethical limits, this study aims to reveal how this technology operates as both a source of innovation and a tool of injustice.

1. Transformation of Digital Marketing with AI

In the early stages of marketing, mass communication tools such as print media, radio, and television aimed to appeal to large audiences with standardised messages. This was the inevitable result of an approach that ignored individual differences. However, the proliferation of the Internet in the 1990s heralded the birth of digital marketing; measurable and interactive

tools such as email campaigns and search engine optimisation (SEO/SEM) reshaped the basic paradigms of this discipline (Babadoğan, 2024). The rise of data analytics in the 2000s dramatically increased the capacity of businesses to monitor and interpret online consumer behaviour. With the explosion of social media and the growth of e-commerce, the volume of data has reached a threshold described as 'big data' (Pasupuleti, 2024). This transformation has transformed marketing from a pure communication activity into a data-driven strategic discipline.

Advanced technologies such as artificial intelligence (AI), machine learning, natural language processing and predictive analytics have redrawn the boundaries of digital marketing. Amazon's recommendation engines have significantly increased conversion rates by providing precise recommendations based on individual consumer preferences. At the same time, Netflix is a concrete example of this transformation by strengthening audience loyalty through dynamic content distribution (Barat & Gulati, 2024). Predictive analytics can predict market trends with an accuracy of 95% (Liu, 2024), taking the capacity of businesses to forecast demand and optimise resources to an extraordinary level (Wang, 2024). However, this technological leap has also brought ethical issues such as data privacy violations, algorithmic biases and lack of transparency in decision-making processes (Elkhatibi & Benabdelouhed, 2024). While extolling the transformative potential of AI, the literature emphasises the urgency of addressing these risks systematically (Dwivedi, 2024).

The integration of AI into digital marketing has not only increased operational efficiency but also radically changed the capacity to individualise consumer experiences. Machine learning algorithms have formed the basis of hyper-personalised strategies by analysing a broad and sophisticated spectrum ranging from social media interactions to previous purchase data (Elkhatibi & Benabdelouhed, 2024). For example, generative AI tools enable marketers to deepen their strategic focus by automating content creation, SEO optimisation, and social media management, making companies more agile and responsive to market demands (Hera, 2024; Mandić, Marković, & Mulović Trgovac, 2024). However, in this process, the phenomenon known as 'filter bubbles' - the exposure of consumers to a limited range of content or products - risks overshadowing the dynamic nature of marketing by suppressing originality and innovation (Babadoğan, 2024). This dilemma makes it clear that the strategic advantages of AI need to be balanced with ethical costs.

Moreover, the role of AI in marketing strategies is not limited to the individual consumer but affects a broader market ecosystem. Predictive analytics and dynamic pricing models have the potential to increase customer satisfaction while maximising ROI through real-time adjustments (Dwivedi, 2024). However, these practices may alienate consumers if personalised pricing is perceived as unfair (Rathnow et al., 2024); for example, algorithms that offer higher prices for low-income groups are controversial from an ethical and competitive perspective. The literature suggests that such practices may distort market competition and reduce the visibility of small-scale businesses, which calls into question the potential of AI to encourage monopolistic tendencies (Csurgai-Horváth, 2024). In this context, the transformative impact of AI in digital marketing is not only a technological issue but also a process of economic and social restructuring.

This technology's lack of ethical and regulatory framework overshadows the innovations that AI offers to digital marketing. Challenges such as data privacy, algorithmic bias, and transparency present the necessity to preserve consumer trust and maintain responsible marketing practices, necessitating businesses to commit more robustly to ethical practices (Tang, 2024). On the other hand, innovative technologies integrated with AI, such as hyper-personalisation, augmented reality (AR) and the Internet of Things (IoT), have the potential to shape the future of marketing (Pasupuleti, 2024).

2. Algorithmic Biases: Sources and Effects

While the AI transformation of digital marketing has brought unprecedented precision and scale to consumer-centric strategies, it has also introduced serious ethical and operational risks, such as algorithmic bias. Algorithmic bias occurs when AI models systematically produce erroneous outputs that favour or disadvantage certain groups, often due to the reflection of inequalities in data (e.g., biases related to race, gender, or socioeconomic status) in algorithms, subjective choices in design processes, or the embedded effects of social norms (Moussawi, Deng, and Joshi 2024; Bigman et al., 2023). In digital marketing, these biases shape processes ranging from targeted advertising to personalised content recommendations, increasing the risk of discrimination, undermining consumer trust, and jeopardising the long-term brand value of businesses (Chen, 2024). Therefore, understanding the origins and dynamics of algorithmic biases is not only a technical issue but also a strategic imperative at the intersection of marketing science and ethical responsibility.

The effects of algorithmic biases on digital marketing are felt across a broad spectrum, from individual consumer experiences to societal structures. When consumers perceive unfair or discriminatory outputs from biased algorithms (e.g., ad targeting that systematically excludes certain demographic groups), their trust in and willingness to engage with digital platforms may decrease, leading to erosion of brand loyalty and reputational damage to businesses (Chen, 2024; Shin, 2024). From a broader perspective, these biases can reproduce social inequalities, limiting access to services and information for marginalised communities, thus creating a cycle that deepens the digital divide. In economic terms, biased algorithms have the potential to affect market dynamics profoundly. Algorithmic bias can distort competition by favouring certain groups, lead to inefficient market outcomes and suppress innovation by providing unfair advantages, thus undermining overall market efficiency (Huang et al., 2024; Basshuysen, 2022). Armed with big data and artificial intelligence, companies can use these biases to their advantage to disadvantage competitors, which may increase market consolidation. At the same time, algorithms that exploit consumers' cognitive biases and information asymmetries may trigger suboptimal purchasing decisions, leading to unnecessary or overpriced products, eroding consumer welfare and deepening economic inequalities (Bar-Gill et al., 2023).

In this context, addressing algorithmic biases is a prerequisite for AI's ethical and practical use in digital marketing. The potential for efficiency and innovation offered by AI systems can only be realised through adherence to the principles of fairness, transparency and accountability at all stages, from these systems' design to implementation (Samala & Rawas, 2024). Otherwise, the risk of prejudices reinforcing existing social structures overshadows the promised benefits of technology.

2.1. Sources of Prejudice

Algorithmic biases in digital marketing have a sophisticated multi-layered web of origins that are not limited to the bias of data sets; they derive from the design paradigms of algorithms (Akter et al., 2022), the socio-cultural contexts in which they are implemented (Singh, 2023), and the strategic prioritisation or revenue-driven models of businesses (Csurgai-Horváth, 2024). For example, an algorithm designed to optimise cost-effectiveness may inadvertently produce discriminatory outputs by inadvertently targeting demographic groups that are less cost-effective to target; such systems may reinforce gender inequalities by systematically making women less visible, as Lambrecht and Tucker (2016) show in their gendered ad targeting in STEM fields. Similarly, social media platforms can marginalise minority

perspectives by highlighting content that aligns with dominant cultural norms, suggesting that algorithmic processes are technical and function as a mirror reflecting socio-economic power dynamics (Singh, 2023). Moreover, the business models of digital platforms to maximise user engagement or profit can lead to the stratification of biases by creating an unfair distribution across content types and demographics (Csurgai-Horváth, 2024).

Design Bias: Design bias emerges as a structural flaw arising from the construction processes of algorithms and can systematically favour specific results over others through the basic assumptions of the model, data selection and method preferences (Akter et al., 2022). Such biases are embedded in the technical architecture of algorithms and often derive from the conscious or unconscious decisions of the developers. For example, an algorithm prioritising cost-effectiveness may favour demographic characteristics requiring fewer resources to target. This bias is not only limited to individual outputs; it can also shape the long-term orientation of marketing strategies, systematically restricting the visibility and reach of certain groups. Design bias is thus a crossroads that illustrates the tension between the technical optimisation goals of algorithmic systems and ethical implications.

Contextual Bias: Contextual bias emerges as a reflection of the socio-cultural environment in which algorithms are implemented and is shaped by the infiltration of cultural norms, social dynamics and historical biases into algorithmic decision-making processes (Akter et al., 2022). Such biases show that rather than being neutral tools, algorithms have a symbiotic relationship with the social structures in which they operate. For example, social media platforms may favour content that aligns with dominant cultural tendencies, overshadowing minority voices or alternative perspectives. Singh's (2023) analysis strikingly illustrates how these dynamics accelerate the marginalisation of minority communities in the digital space. This suggests that algorithms internalise the data and the context in which the data is collected and interpreted, proving that bias is not just a technical problem but an extension of social power relations. Thus, Contextual bias necessitates reassessing marketing strategies regarding cultural sensitivity and inclusiveness.

Implementation Bias: Implementation bias is shaped by strategic preferences arising from the way algorithms are used in practice and the business models of digital platforms; these biases are often driven by commercial goals such as profit maximisation or user engagement (Csurgai-Horváth, 2024). In this process, the prioritisation mechanisms of algorithms may favour users with specific demographics or behavioural

patterns, creating an unfair distribution of content access and visibility. This type of bias illustrates the conflict between the economic logic of digital marketing and its ethical responsibilities, as profit-driven optimisation can often have consequences that ignore social diversity and equality (Csurgai-Horváth, 2024). Implementation bias, therefore, raises questions about how algorithmic systems are designed, how they are deployed, and what purposes they serve.

2.2. Effects on Marketing Strategies

Algorithmic bias is emerging as a factor that profoundly affects key marketing strategies, transforming how businesses interact with consumers while potentially opening the door to unfair or discriminatory practices. These biases arise from distortions in data sets, structural flaws in the design of algorithmic models and the way they are applied in different contexts, with serious consequences for customer equity and marketing effectiveness.

Firstly, customer segmentation is one of the areas where the most apparent effects of algorithmic bias are observed. Biased data or models can lead to the overrepresentation of certain demographic groups or the systematic omission of others.

Secondly, personalisation and targeting processes can be significantly distorted by the influence of biased algorithms. Chen (2024) shows that bias disrupts personalisation efforts by producing recommendations that do not align with customer preferences or needs. For example, a machine learning model prioritising certain features over others may inadvertently exclude some customer segments or serve irrelevant content.

Third, pricing and promotion strategies are the areas where algorithmic bias's ethical and practical implications are most strikingly evident. Biased algorithms can lead to discriminatory pricing practices towards specific customer segments; for example, biased datasets may offer some groups unfair pricing advantages while disadvantaging others. Similarly, biases in the distribution of promotions can undermine overall marketing effectiveness by preventing promotional efforts from reaching the entire customer base equally. This not only undermines consumer confidence but can also expose businesses to legal and ethical scrutiny.

2.3. Segmentation and Prejudices

In marketing segmentation, algorithms have emerged as indispensable tools that provide businesses with targeted strategies, personalised experiences and optimised resource allocation by segmenting customer bases

based on shared characteristics, preferences and behaviours. However, in this process, algorithmic biases emerge as an important factor that threatens segmentation models' accuracy, effectiveness and fairness. They are fed by multiple sources ranging from data collection methods, consumer behaviour assumptions and the algorithmic design.

Algorithms play a fundamental role in marketing segmentation; methods such as K-means, DBSCAN and agglomerative hierarchical clustering provide valuable outputs to businesses by revealing hidden patterns in large datasets. K-means stands out for its simplicity and efficiency; for example, when integrated with RFM analysis, it has been shown to segment consumers based on behavioural patterns with 95% accuracy (Sarkar et al., 2024). DBSCAN performs better in irregular data distributions and noisy environments (Boyko & Protsik, 2024), while agglomerative hierarchical clustering offers global and local perspectives on complex data types (Panda et al., 2024). These algorithms increase customer satisfaction by enabling personalised marketing strategies (Potluri et al., 2024), maximise return on investment by optimising resource allocation (Reddy et al., 2024), and strengthen strategic decision-making processes by revealing hidden trends (Potluri et al., 2024). However, these benefits are overshadowed by the bias-prone nature of the algorithms.

Biases in segmentation processes originate from multiple sources and call into question the reliability of the models. Inaccuracies in self-reported data, such as reporting inconsistencies in postcode-based geodemographic segmentation, can be influenced by demographic factors and produce skewed results (Gladden et al., 2015). Behavioural biases can bias segmentation models by deriving from irrational consumer preferences and decision-making processes (Guhl et al., 2020). Methodological and theoretical shortcomings exacerbate biases due to segmentation frameworks failing to address consumer behaviour holistically (Ji, 2003). Furthermore, choosing loss functions - for example, Cross Entropy or Dice losses - can lead to biased segmentation outputs (B. Liu et al., 2024). Social influence and position biases complicate segmentation, especially in freemium markets, by basing consumer preferences on social dynamics rather than product attributes (Berbeglia, Berbeglia, & Hentenryck, 2021), while economic factors shape segmentation strategies through conditions such as demand and supply elasticity (Martin & Zwart, 1987).

The impact of biases on segmentation is a technical issue and an ethical responsibility. Algorithms can perpetuate discrimination by inheriting social biases found in educational data; for example, AI-driven targeting

can reinforce biases associated with protected characteristics such as race or socioeconomic status, and this has been demonstrated by fairness measures such as Disparate Impact (DI) (Soni, 2024). In fields such as healthcare, biased data can lead to inaccurate predictions (Goankar, Cook, & Macyszyn, 2020), while personalised ads can violate ethical standards by providing discriminatory recommendations to low-income groups (Parasrampuria & Williams, 2023). This brings with it the risk that segmentation models may produce misleading and unfair results, jeopardising customer equity and brand reputation.

3. Effects on Consumer Trust and Corporate Reputation

The widespread use of algorithms in marketing strategies has profound and multifaceted impacts on consumer trust and corporate reputation. These effects are mainly due to algorithms' biased outputs, lack of transparency and potential to lead to unethical practices. Academic literature reveals that algorithmic decision-making processes directly shape consumers' perceptions of brands and that these perceptions play a decisive role in the construction or destruction of trust (Susarla, Purnell, & Scott, 2024). In particular, cases where biased algorithms create perceptions of unfairness erode consumer trust in businesses while simultaneously exposing corporate reputation to long-term risks. This dynamic affects not only individual consumer-brand relationships but also the broader structure of market competition and the social fabric.

The impact of algorithms on consumer trust is not only a technical issue but is also noteworthy for its social and psychological dimensions. Non-transparent algorithmic processes reinforce consumers' sense of loss of control over these systems and accelerate the erosion of trust (Dezao, 2024).

In terms of corporate reputation, the effects of algorithms should be examined across a spectrum that encompasses both short-term operational outcomes and long-term strategic positioning. Scandals caused by biased or manipulative algorithms can lead to reputational damage by identifying brands with unethical practices. Moreover, the potential for algorithms to reinforce systemic inequalities exposes businesses to individual consumer backlash and societal criticism (Koene, 2017). In this context, the impact of algorithms on consumer trust and corporate reputation emerges as an area that tests not only the technological competencies of businesses but also their ethical stance and social responsibilities, which necessitates algorithmic governance to become a strategic priority.

3.1. Loss of Trust

The destructive impact of algorithmic biases on consumer trust is a powerful dynamic resulting from perceived unfairness and lack of transparency. The inaccurate price predictions of Zillow's iBuying algorithm, for example, not only led to financial losses but also raised serious doubts about the reliability of artificial intelligence, clearly demonstrating the fragility of algorithms and their psychological impact on consumers (Susarla, Purnell, & Scott, 2024). Similarly, the systematic exclusion of communities of colour by race-based ad targeting has caused an intense consumer backlash against brands and shaken the foundation of trust (McIlwain, 2023). Lack of transparency further complicates this process; consumers feel manipulated or neglected when they do not understand decision-making processes (Dezao, 2024). Such incidents show that businesses need to design algorithmic systems in a way that is not only compatible with technical accuracy but also with consumer perceptions and ethical norms; otherwise, loss of trust can lead to irreversible erosion of customer loyalty and market share.

3.2. Reputation Risks

The impact of algorithms on corporate reputation is dramatically manifested by the blows to brand perception caused by unethical practices and manipulative campaigns. While such incidents lead to sales losses in the short term, they trigger reputational erosion in the long term, permanently weakening the perception of the credibility of brands (Akter et al., 2022). Moreover, the distortions created by algorithms in market competition create an environment where large players gain unethical advantages, especially by disadvantaging small businesses (Csurgai-Horváth, 2024). This dynamic exposes businesses to individual consumer backlash and an industry-wide wave of ethical questioning, suggesting that algorithmic strategies should be evaluated not only from a profitability perspective but also from a reputational capital perspective. Reputational risks are thus becoming a central element in the strategic planning of businesses.

3.3. Social Impacts

The societal impacts of algorithms encompass a domain where bias and personalised content transcend individual consumer experiences to become a force shaping the social fabric. The disinformation amplification of biased algorithms exacerbates social polarisation by creating echo chambers that reinforce users' existing beliefs; this systematically undermines the capacity for dialogue and compromise (Shin, 2024). More importantly, the potential for algorithms to reinforce systemic inequalities leads to the reproduction

of historical injustices in the digital age, suggesting that the societal consequences of AI are not merely a side effect but a fundamental design issue (Koene, 2017). These impacts shift the responsibility of businesses from being limited to the consumer to a broader social context; algorithms are thus positioned as both a technological tool and a social actor. When businesses ignore these impacts, they risk their reputation and social legitimacy, a caveat that necessitates an ethical and inclusive framing of algorithmic design.

4. Solution Suggestions

The biases of algorithms in marketing strategies and their adverse effects on consumer trust and corporate reputation require businesses and academics to develop comprehensive and multidimensional solutions. These solutions range from technical innovations to ethical principles and regulatory frameworks, as the risks of algorithmic systems are not limited to data processing or model design but extend to broader areas such as social dynamics and organisational legitimacy. The literature suggests that such approaches can go beyond reducing bias and increase algorithms' transparency, improve consumer perceptions and strengthen brand credibility in the long run (Chen, 2024; Rebitschek, 2024). The proposed solutions offer a strategic framework combining operational efficiency and ethical responsibility in this context.

The resolution of algorithmic biases is a technical issue and an endeavour for businesses to rebuild trust in their relationship with consumers and maintain their social acceptability. While technical solutions aim to reduce bias through, for example, fair data processing methods, ethical frameworks enshrine fairness and privacy as fundamental principles in the design of algorithms (Soni, 2024). However, the success of these efforts depends on being supported by international regulatory standards that go beyond the capacity of individual businesses, with examples such as the GDPR and the EU Artificial Intelligence Act proving to deliver tangible advances in data privacy and transparency (Al-Haj Eid et al., 2024; Hulicki, 2023). This tripartite structure - technical, ethical and regulatory - has the potential to systematically minimise the risks of algorithms while preserving their potential advantages.

From a broader perspective, the proposed solutions developed for algorithms have the power to shape the future role of AI beyond addressing current problems. By implementing these solutions, businesses can reverse the loss of trust and reputational erosion caused by biased systems; in the

process, they can seize the opportunity to establish a more transparent and fair relationship with consumers (Bar-Gill, Sunstein, & Talgam-Cohen, 2023).

4.1. Technical Solutions

Addressing algorithmic bias at a technical level requires innovative strategies ranging from data handling processes to model design; this is a key element in improving the fairness and effectiveness of marketing practices. Fair data processing methods, such as resampling and using metrics such as Differential Impact (DI), can prevent discrimination by correcting imbalanced data sets; these techniques produce more inclusive results by intervening in the source of bias (Soni, 2024). In addition, explainable AI (XAI) presents algorithmic processes transparently to consumers through tools such as decision trees; this not only strengthens trust but also increases the accountability of businesses (Chen, 2024). These technical solutions emphasise that algorithms should be developed not only with a focus on accuracy and efficiency but also with an ethical and consumer-oriented approach so businesses can maximise their technological advantages while minimising the risks of bias.

4.2. Ethical Frameworks

Ethical frameworks aim to reverse the adverse effects of bias on consumer trust by establishing fairness, privacy and transparency as fundamental principles in the design and implementation of algorithms. Transparency restores trust by clearly explaining the workings of algorithms to consumers, which is especially critical in situations where perceptions of privacy violations are widespread (Rebitschek, 2024). On the other hand, ethical design prioritises privacy and fairness principles from the outset of the development process, ensuring that algorithms function in line with technical performance and societal values (Sharma & Sharma, 2023). These frameworks require businesses to meet legal requirements, consumer expectations, and ethical standards so that algorithms can move from being a risk factor to an indicator of corporate responsibility.

4.3. Regulatory Approaches

Regulatory approaches aim to ensure consumer protection and organisational accountability by providing international standards and cooperation mechanisms to address the systemic effects of algorithmic biases. Regulations such as the GDPR put data privacy in a strong framework (Al-Haj Eid et al., 2024), while the EU Artificial Intelligence Act reduces

the societal risks of algorithmic systems by mandating transparency and ethical practices (Hulicki, 2023). However, the success of these regulations relies on collaboration between AI developers, ethicists, and regulators; this multidisciplinary approach generates holistic solutions by considering not only the technical but also the societal dimensions of biases (Bar-Gill, Sunstein, & Talgam-Cohen, 2023). This regulatory vision allows businesses to move towards fairer and more transparent algorithmic practices while maintaining a competitive advantage in global markets, thus balancing algorithms as both a source of innovation and an area of social responsibility.

Conclusion

The rise of artificial intelligence (AI) algorithms in digital marketing has opened up a unique competitive space for businesses by enhancing individualised campaigns and data-driven decision-making capabilities (Gupta, 2024). However, this study reveals that algorithmic biases create ethical and practical cracks in marketing strategies. Through a systematic literature review, it has been confirmed that AI systems have the potential to discriminate based on sensitive factors such as race, gender, and socioeconomic status; these biases have been observed to either exclude or falsely target specific social clusters in segmentation processes (Pappadà & Pauli, 2023; Bigman et al., 2023; Soni, 2024). This undermines the effectiveness of marketing campaigns, erodes consumer trust, and can jeopardise organisational legitimacy. This chapter argues that the transformative power of AI can only be fully realised when it is free from these shadows.

The origins of algorithmic biases are characterised by systematic distortions in educational data, deficiencies in design decisions and dynamics shaped by socio-cultural contexts (Singh, 2023). Findings reveal that these biases are not mere technical failures; on the contrary, they function as a powerful catalyst that deepens social inequalities (McIlwain, 2023). For example, discriminatory practices of personalised advertising algorithms towards low-income communities create long-term threats to brand loyalty while fuelling consumer dissatisfaction; this undermines the principle of equal access, the fundamental promise of marketing (Parasrampuria & Williams, 2023). Moreover, the lack of transparency in algorithmic decision-making paralyses accountability mechanisms and calls into question the ethical obligations of businesses (Nazeer, 2024). This clearly shows that AI is a tool and a reflection of societal values.

In this context, placing AI in digital marketing on an ethical footing requires an urgent and multi-layered intervention. While technical strategies to eliminate biases - such as justice-oriented data processing techniques and explainable AI models - form the cornerstones of the solution (Soni, 2024; Chen, 2024), international standards and regulatory frameworks support these efforts with an institutional discipline (Hulicki, 2023). While regulations such as GDPR provide a solid foundation for data privacy protection, the need for more inclusive guidelines based on algorithmic fairness and transparency is evident (Sharma & Sharma, 2023; Adams-Prassl et al., 2024). Businesses should prioritise strategic investments in ethical AI practices to restore consumer trust and maintain competitive advantage (Yadav, 2024). This is not only an operational imperative but also a moral imperative for marketing to evolve into a future aligned with social responsibility.

In conclusion, algorithmic biases present both a threat and an opportunity as a dilemma shaping the future of digital marketing. This study argues that in order to harness the transformative potential of AI fully, it is essential that ethical and technical dimensions are addressed together; this requires a delicate balance between innovation and fairness. Future research should strengthen this balance by examining the practical applications of bias reduction techniques and their long-term effects on consumer perception (Vasileva, 2020). Thus, marketing strategies can become a field that appeals to all segments by harmonising technological progress with social welfare.

It should not be forgotten that digital marketing is not only a commercial discipline but also a mirror of social structures. If not framed ethically, the advantages of personalisation and automation offered by AI risk institutionalising discrimination and undermining trust. For example, the systematic exclusion of minority groups in audience identification processes not only narrows the consumer base but also jeopardises the long-term reputation of companies (Bigman et al., 2023).

References

Akter, Shahriar, Yogesh K. Dwivedi, Shahriar Sajib, Kumar Biswas, Ruwan J. Bandara, ve Katina Michael. 2022. "Algorithmic Bias in Machine Learning-Based Marketing Models". Journal of Business Research 144: 201-16. doi:10.1016/j.jbusres.2022.01.083.

Al Haj Eid, Mohammad, Mohammad Abu Hashesh, Abdel-Aziz Ahmad Sharabati, Ahmad Khraiwish, Shafig Al-Haddad, ve Hesham Abusaimeh. 2024. "Conceptualizing Ethical AI-Enabled Marketing: Current State and Agenda for Future Research". doi:10.20944/preprints202404.0786.v1.

Babadoğan, Borga. 2024. "Unveiling the Power of AI-Driven Personalization: Transforming Consumer Behavior in the Age of Digital Marketing". Next Frontier For Life Sciences and AI 8(1): 61. doi:10.62802/fj43xy18.

Bar-Gill, Oren, Cass R. Sunstein, ve Inbal Talgam-Cohen. 2023. "Algorithmic Harm in Consumer Markets". SSRN Electronic Journal. doi:10.2139/ssrn.4321763.

Barat, Ayan, ve Krity Gulati. 2024. "Emergence of AI in Marketing and its Implications". Lloyd Business Review: 1-24. doi:10.56595/lbr.v3i1.22.

Berbeglia, Franco, Gerardo Berbeglia, ve Pascal Van Hentenryck. 2021. "Market Segmentation in Online Platforms". doi:10.48550/arXiv.1511.00750.

Bigman, Yochanan E., Desman Wilson, Mads N. Arnestad, Adam Waytz, ve Kurt Gray. 2023. "Algorithmic Discrimination Causes Less Moral Outrage than Human Discrimination." Journal of Experimental Psychology: General 152(1): 4-27. doi:10.1037/xge0001250.

Boyko, Bogdan, ve Irina Protsik. 2024. "USE OF CLUSTERING ALGORITHMS TO SEGMENT THE COMPANY'S PERSONNEL". Herald of Khmelnytskyi National University. Technical sciences 333(2): 92-98. doi:10.31891/2307-5732-2024-333-2-14.

Chen, Changdong. 2024. "How Consumers Respond to Service Failures Caused by Algorithmic Mistakes: The Role of Algorithmic Interpretability". Journal of Business Research 176: 114610. doi:10.1016/j.jbusres.2024.114610.

Csurgai-Horváth, Gergely. 2024. "Regulating Algorithmic Bias as a Key Element of Digital Market Regulation". World Competition 47(Issue 2): 193-212. doi:10.54648/WOCO2024015.

Dezao, Tara. 2024. "Enhancing Transparency in AI-Powered Customer Engagement". Journal of AI, Robotics & Workplace Automation 3(2): 134. doi:10.69554/PPJE1646.

Dwivedi, Y. 2024. "AI Virtual Assistants in Human Services: Empowering Customers and Caseworkers". International Jurnal Of Scientific Re-

search in Engineering and Management 08(11): 1-7. doi:10.55041/IJSREM37870

Elkhatibi, Yassine, ve Redouane Benabdelouhed. 2024. "Digital Revolution: How AI is Transforming Content Marketing". International Journal of Advanced Multidisciplinary Research and Studies 4(5): 775-77. doi:10.62225/2583049X.2024.4.5.3324.

Gladden, James M., George R. Milne, ve Mark A. McDonald. 2015. "Biases in Self-Reports of Zip Codes and Zip +4 in(Pappadà ve Pauli 2022) Geodemographic Segmentation". İçinde Proceedings of the 1997 World Marketing Congress, Developments in Marketing Science: Proceedings of the Academy of Marketing Science, ed. Samsinar Md Sidin ve Ajay K. Manrai. Cham: Springer International Publishing, 85-94. doi:10.1007/978-3-319-17320-7_23.

Goankar, Bilwaj, Kirstin Cook, ve Luke Macyszyn. 2020. "Ethical Issues Arising Due to Bias in Training A.I. Algorithms in Healthcare and Data Sharing as a Potential Solution". AI Ethics Journal 1(2). doi:10.47289/AIEJ20200916.

Guhl, Daniel, Katharina Dowling, Daniel Klapper, Martin Spann, Lucas Stich, ve Narine Yegoryan. 2020. "Behavioral Biases in Marketing". Journal of the Academy of Marketing Science 48(3): 449-77. doi:10.1007/s11747-019-00699-x.

Gupta, Dr. Ruchi. 2024. "The impact of Artificial intelligence on Marketing Strategies: A Comprehensive Analysis". International Journal for Research in Applied Science and Engineering Technology 12(11): 270-71. doi:10.22214/ijraset.2024.65002.

Hera, Octavian Dumitru. 2024. "Exploring Marketing Transformation in the Age of Artifical Intelligence". Journal of Financial Studies 9(Special): 96-108. doi:10.55654/JFS.2024.9.SP.07.

Huang, Yijun, Qiteng Chen, Lie Luo, ve Zhongyan Lin. 2024. "Algorithmic Discrimination and Market Competition: Exploring the Ethical and Legal Issues of Algorithm Management by Internet Companies". Philosophy and Social Science 1(5): 22-27. doi:10.62381/P243504.

Hulicki, Maciej. 2023. "The principles of algorithmic justice in the digital market". İçinde Research Handbook on Digital Trade, ed. David Collins ve Michael Geist. Edward Elgar Publishing, 345-68. doi:10.4337/9781800884953.00032.

Ji, Luo. 2003. "Market Segmentation Research: Critical Review and Perspectives". Journal of Shandong University.

Koene, Ansgar. 2017. "Algorithmic Bias: Addressing Growing Concerns [Leading Edge]". IEEE Technology and Society Magazine 36(2): 31-32. doi:10.1109/MTS.2017.2697080.

Lambrecht, Anja, ve Catherine E. Tucker. 2016. "Algorithmic Bias? An Empirical Study into Apparent Gender-Based Discrimination in the Display of STEM Career Ads". SSRN Electronic Journal. doi:10.2139/ssrn.2852260.

Liu, Bingyuan, Jose Dolz, Adrian Galdran, Riadh Kobbi, ve Ismail Ben Ayed. 2024. "Do We Really Need Dice? The Hidden Region-Size Biases of Segmentation Losses". Medical Image Analysis 91: 103015. doi:10.1016/j.media.2023.103015.

Liu, Jinwen. 2024. "Marketing Strategy Matching Algorithm Under Artificial Intelligence". İçinde 2024 Third International Conference on Distributed Computing and Electrical Circuits and Electronics (ICDCECE), Ballari, India: IEEE, 1-5. doi:10.1109/ICDCECE60827.2024.10548817.

Mandić, Antonija, Biljana Marković, ve Ana Mulović Trgovac. 2024. "Tools of Artificial Intelligence Technology as a Framework for Transformation Digital Marketing Communication". Tehnički glasnik 18(4): 660-65. doi:10.31803/tg-20240708161118.

Martin, S.K., ve A.C. Zwart. 1987. "MARKETING AGENCIES AND THE ECONOMICS OF MARKET SEGMENTATION*". Australian Journal of Agricultural Economics 31(3): 242-55. doi:10.1111/j.1467-8489.1987.tb00467.x.

McIlwain, Charlton D. 2023. "Algorithmic Discrimination: A Framework and Approach to Auditing & Measuring the Impact of Race-Targeted Digital Advertising". SSRN Electronic Journal. doi:10.2139/ssrn.4646843.

Moussawi, Sara, Xuefei (Nancy) Deng, ve K. D. Joshi. 2024. "AI and Discrimination: Sources of Algorithmic Biases". ACM SIGMIS Database: the DATABASE for Advances in Information Systems 55(4): 6-11. doi:10.1145/3701613.3701615.

Oleg Ye., Backsanskiy. 2025. "Balancing Ethics and Innovation in Artificial Intelligence". Society: philosophy, history, culture (1): 23-33. doi:10.24158/fik.2025.1.2.

Panda, Amiya Ranjan, Priyanka Rout, ve Aman Gautam. 2024. "Optimizing Marketing Strategy by Performing Customer Segmentation". İçinde 2024 International Conference on Advances in Computing Research on Science Engineering and Technology (ACROSET), Indore, India: IEEE, 1-6. doi:10.1109/ACROSET62108.2024.10743643.

Pappadà, Roberta, ve Francesco Pauli. 2022. "Discrimination in machine learning algorithms". doi:10.48550/ARXIV.2207.00108.

Parasrampuria, Anirudh, ve Katherine Williams. 2023. "Ethical Considerations and Societal Impact of Personalized Advertising Algorithms". Journal of Student Research 12(4). doi:10.47611/jsrhs.v12i4.5910.

Pasupuleti, M.K. 2024. "Transforming Digital Marketing with AI: Strategies for Personalized Content and Ethical Advertising". İçinde AI in Digital Marketing: Personalizing Content and Advertising Strategies, National Education Services, 1-18. doi:10.62311/nesx/66296.

Potluri, Chandra Srinivas, G. Srinivasa Rao, L.V.R Manoj Kumar, Kedir Geletu Allo, Yaregal Awoke, ve Abdilkerim Asrar Seman. 2024. "Machine Learning-Based Customer Segmentation and Personalised Marketing in Financial Services". İçinde 2024 International Conference on Communication, Computer Sciences and Engineering (IC3SE), Gautam Buddha Nagar, India: IEEE, 1570-74. doi:10.1109/IC3SE62002.2024.10593143.

Rathnow, Peter, Benjamin Zeller, ve Matthias Lederer. 2024. "From Code to Coin: Unravelling the Practical Business Impact of Algorithmic Pricing". Journal of AI, Robotics & Workplace Automation 3(3): 234. doi:10.69554/YMZP4012.

Rebitschek, Felix G. 2024. "Boosting Consumers: Algorithm-Supported Decision-Making under Uncertainty to (Learn to) Navigate Algorithm-Based Decision Environments". Içinde Knowledge and Digital Technology, Knowledge and Space, ed. Johannes Glückler ve Robert Panitz. Cham: Springer Nature Switzerland, 63-77. doi:10.1007/978-3-031-39101-9_4.

Reddy, Biyyapu Sri Vardhan, C. A. Rishikeshan, VishnuVardhan Dagumati, Ashwani Prasad, ve Bhavya Singh. 2024. "Customer Segmentation Analysis Using Clustering Algorithms". Içinde Intelligent Systems, Lecture Notes in Networks and Systems, ed. Siba K. Udgata, Srinivas Sethi, ve Xiao-Zhi Gao. Singapore: Springer Nature Singapore, 353-68. doi:10.1007/978-981-99-3932-9_31.

Samala, Agariadne Dwinggo, ve Soha Rawas. 2025. "Bias in artificial intelligence: smart solutions for detection, mitigation, and ethical strategies in real-world applications". IAES International Journal of Artificial Intelligence (IJ-AI) 14(1): 32. doi:10.11591/ijai.v14.i1.pp32-43.

Sarkar, Malay, Aisharyja Roy Puja, ve Faiaz Rahat Chowdhury. 2024. "Optimizing Marketing Strategies with RFM Method and K-Means Clustering-Based AI Customer Segmentation Analysis". Journal of Business and Management Studies 6(2): 54-60. doi:10.32996/jbms.2024.6.2.5.

Sharma, Animesh Kumar, ve Rahul Sharma. "Considerations in Artificial Intelligence-Based Marketing: An Ethical Perspective". Applied Marketing Analytics: The Peer-Reviewed Journal 9, sy 2 (01 Ekim 2023): 162. https://doi.org/10.69554/RAPQ3226.

Shin, Donghee. 2024. "Misinformation and Algorithmic Bias". Içinde Artificial Misinformation, Cham: Springer Nature Switzerland, 15-47. doi:10.1007/978-3-031-52569-8_2.

Singh, Daman Preet. 2023. "Algorithmic Bias of Social Media". The Motley Undergraduate Journal 1(2). doi:10.55016/ojs/muj.v1i2.77457.

Soni, Vishvesh. 2024. "Bias Detection and Mitigation in AI-Driven Target Marketing: Exploring Fairness in Automated Consumer Profiling". International Journal of Innovative Science and Research Technology (IJISRT): 2574-84. doi:10.38124/ijisrt/IJISRT24MAY2203.

Susarla, Padma, Dexter Purnell, ve Ken Scott. 2024. "Zillow's Artificial Intelligence Failure and Its Impact on Perceived Trust in Information Systems". Journal of Information Technology Teaching Cases: 20438869241279865. doi:10.1177/20438869241279865.

Susarla, Padma, Dexter Purnell, ve Ken Scott. 2024. "Zillow's Artificial Intelligence Failure and Its Impact on Perceived Trust in Information Systems". Journal of Information Technology Teaching Cases: 20438869241279865. doi:10.1177/20438869241279865.

Tang, Zicheng. 2024. "The Role of AI and ML in Transforming Marketing Strategies: Insights from Recent Studies". Advances in Economics, Management and Political Sciences 108(1): 132-39. doi:10.54254/2754-1169/108/20242009.

Van Basshuysen, Philippe. 2023. "Markets, Market Algorithms, and Algorithmic Bias". Journal of Economic Methodology 30(4): 310-21. doi:10.1080/1350178X.2022.2100919.

Vasileva, Mariya I. 2020. "The Dark Side of Machine Learning Algorithms: How and Why They Can Leverage Bias, and What Can Be Done to Pursue Algorithmic Fairness". İçinde Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining, Virtual Event CA USA: ACM, 3586-87. doi:10.1145/3394486.3411068.

Wang, Weihan. 2024b. "Artificial Intelligence in Strategic Business Decisions: Enhancing Market Competitiveness". Advances in Economics, Management and Political Sciences 117(1): 87-93. doi:10.54254/2754-1169/117/20241987.

Yadav, Suraj Jaywant. 2024. "AI Bias and Fairness: Ethical Considerations in Service Marketing Strategies". IGI Global, 49-64. doi:10.4018/979-8-3693-7122-0.ch003.