Ethical Marketing AI? A Structured Literature Review of the Ethical Challenges Posed by Artificial Intelligence in the Domains of Marketing and Consumer Behavior

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Abstract

With the increasing use of AI in marketing, ethical repercussions are beginning to emerge. From privacy issues, through discrimination of marginalized groups, to emergent systemic social distortions, AI is changing the marketing ethical landscape. In this paper we conduct a structured literature review of the emerging ethical issues posed by AI in the domains of marketing and consumer behavior. We identify three clusters of ethical issues (algorithm, society and existential) and map these to the marketing domains of systems, brands, and consumers. We conclude that the field of ethical marketing AI is still very much in its infancy, but such is the rate of development ethical marketing AI is likely to become an important field for academics and practitioners alike.

Keywords: AI, Ethics, Marketing, Consumer Behavior

"A robot may not injure a human being or, through inaction, allow a human being to come to harm.

A robot must obey the orders given to it by human beings except where such orders would conflict with the First Law.

A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws."

Three Laws of Robotics by Isaac Asimov

1. Introduction

According to Nilsson (2009), artificial intelligence (AI) is that activity devoted to endowing machines intelligence that enables an entity to function appropriately and with foresight in its environment. Here, machine does not only mean stoid thing that is often typified by images of gears grinding and steam hissing, but also a functioning computer system containing both hardware and software. More importantly, nowadays, the distinction between hardware and software has become somewhat blurred because most modern computers have some of their programs built right into their hardware circuitry. Therefore, when we refer to "machines that learn" in the AI field, we might actually mean the programs that are doing things with intelligence.

When Isaac Asimov (1941) devised his Three Laws of Robotics several decades ago, he foresaw the potential dangers of autonomous AI agents. He envisioned robots as servants and the need for them to be programmed with rules to prevent them from harming people. Nowadays, AI and machine learning are increasingly used in the software companies and consumers use every day, whether it's being used in clinical medical practice, intelligent scheduling, automated trading, translating languages, automating invention, recognizing faces, or for searching the internet or selecting government services, etc. A poorly designed AI system built on faulty, inadequate or biased data can have unintended, potentially harmful consequences. Furthermore, with the rapid advancement in algorithmic systems, in some cases, it is not clear how an AI-derived its conclusions, so we have to rely on systems we don't understand to make decisions that could impact society.

Marketing increasingly relies on AI's algorithms, which mimic human cognitive functions and exhibit aspects of human intelligence (Huang & Rust, 2018; Rangaswamy et al., 2020; Sterne, 2017). The applications of AI in the marketing domain, despite the lack of a uniform definition of AI in marketing, involve technologies that allow them to learn, connect, and adapt to the marketing context (Huang & Rust, 2021). To develop insights, these tools typically utilize large volumes of data.

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Research in the application of AI in the marketing domain identifies ten salient aspects: (1) understanding consumer sentiments, (2) industrial opportunities of AI, (3) analyzing customer satisfaction, (4) electronic word-of-mouth–based insights, (5) improving market performance, (6) using AI for brand management, (7) measuring and enhancing customer loyalty and trust, (8) AI and novel services, (9) using AI to improve customer relationships, and (10) AI and strategic marketing (Mustak et al., 2021). Vlačić et al. (2021)'s study of selected articles by means of the Multiple Correspondence Analysis (MCA) procedure outlines several research avenues related to the adoption, use, and acceptance of AI technology in marketing, the role of data protection and ethics, the role of institutional support for marketing AI, as well as the revolution of the labor market and marketers' competencies. In addition, Mariani, Perez-Vega, and Wirtz (2021)'s literature review of AI in marketing, consumer behavior and psychology suggested that AI-related ethics is a critically important, but underexplored topic.

To fill in this gap, we conducted a literature review on the following eight topics identified by these researchers, such as (1) memory and computational logic, (2) decision making and cognitive processes, (3) neural networks, (4) machine learning and linguistic analysis, (5) social media and text mining, (6) social media content analytics, (7) technology acceptance and adoption, as well as (8) big data and robots. The purpose of this literature review is to unpack those ethical issues existing in data, algorithms and technology which determine AI, and understand how they could impact marketers' interaction with consumers, as well as consumers' well-being.

2. Theoretical background

2.1. AI Ethics and the moral significance of technology

According to Williams and Aitken (2011), ethical norms can be divided into two categories: those one should (or shouldn't) do because they will have desirable (or undesirable) effects, and those one should do because one has to do so. As AI may have varying degrees of learning ability, adaptively, and connectivity, the question becomes whether AI can learn and adapt to "what is socially desirable" and can handle moral dilemmas.

AI ethics are concerned about the impact of AI on human beings, institutions, and society as a whole (Siau & Wang, 2020). There is a growing awareness of the ethical issues posed by the design, development, deployment and use of AI systems not only in academic literature but also in mainstream media (Morley et al., 2020). Privacy, fairness, accountability, accessibility, environmental sustainability, and transparency are all issues largely being discussed at both the algorithmic and application level (Morley et al., 2021). As scholars analyze the way AI impacts individuals and organizations, they turn to theories regarding the adoption and use of technology. Du and Xie (2021) applied the moral mediation theory of technology (Verbeek, 2014, 2011) to study the ethical challenges and opportunities of AI in consumer markets. According to this theory, technologies in use establish relations between humans and their environments, and ethical decisions are often a result of human-technology collaboration (Du & Xie, 2021).

In the marketing domain, brands, marketing agencies, frontline employees, and consumers collectively create unique contexts in which ethical issues arise and have different meanings for each entity. As AI develops into a more thoughtful and self-aware machine with humanness, AI ethics have a far-reaching impact on the moral dilemma of human existence (Boddington, 2017). An example would be when AI replaces humans to allocate market resources. This future outlook is also expected to impact marketing practices as marketing activities have become important channels through which AI exerts its impact on humans (Davenport., et al. 2020).

2.2. AI and Marketing

Ethical issues arise in a number of marketing areas. For example, AI-based technologies are poised to drastically change the way healthcare is delivered. AI is increasingly used in diagnostic assistance, as well as nursing and management assistance (Lee & Yoon, 2021). Despite its utility, AI application presents unique ethical challenges to the industry, in a range of areas including consumer privacy (Angst & Agarwal, 2009).

Another popular application domain of AI is the service industry. AI-delivered services are seen as more accurate, consistent, and predictable than human-based services (Chi et al., 2020; Gursoy et al., 2019). For example, in the hospitality industry AI is being used in smart devices, self-service technologies, chatbots, service robots, text conversion, language translators, and virtual assistants (Chi et al., 2020). Apart from the resistance from consumers who may prefer humans to machines (Zhu & Chang, 2020), and the consequential value destruction (Castillo et al., 2020), there are wider

ethical issues of consumer privacy and the potential for discrimination.

In addition, AI is widely used in consumer engagement and information dissemination. First, AI is used to listen to and understand public conversations, such as on social media, in order to assess consumer perceptions of new products, event experiences, and branding in general (Naraine & Wanless, 2020). Second, AI is used to automate the sales process, for example using chatbots and individualized services to increase sales performance. Third, AI is used in generating customer content: automating journalism, advertising, and promotions can allow personnel to focus on other revenue-generating tasks. Fourth, businesses have begun to implement using AI to develop "virtual" customer service resources to handle certain issues and get to the core of dissent or dissatisfaction. A fifth area, facial recognition, has been introduced in event management (Nugrah et al., 2021). With the implementation of RFID and blockchain in ticketing accounting information system design, AI is expected to facilitate a more efficient and accountable multi-entertainment event. Once again the ethics of using AI in each of these areas have yet to be fully explored.

3. Method and Data

The purpose of this literature review is to explicate the ethical issues emerging from the use of AI in marketing and consumer behavior. AI impacts both marketers' and consumers' behaviors which may result in the magnification of traditional marketing ethical issues and may also result in the emergence of new ethical challenges. It was revealed from our exploratory search that relevant work is widely dispersed among multiple publishers, conferences, and journals. As a result, we chose the Web of Science database, to ensure comprehensive coverage of the subject. We included works published up until June 10, 2022. We follow the literature review process outlined by Xiao and Watson (2019). First, we formulate the research questions: (1) What AI-related ethical issues have been discussed in the existing literature? (2) How do these issues relate to the marketing domain, including consumers, brands, and general marketing systems? Second, we identified a set of keywords related to AI ethics according to the recent structured literature review of AI conducted by Mariani et al. (2021). The keywords were: "AI," "machine learning," "automation," "robot," "neural networks," "digitalization," "algorithm," "big data," "social media," "natural language processing," "data mining," "text mining," "soft computing," "fuzzy

logic," "biometrics," "geotagging," "wearable*," "IoT," "Internet of Things," "chatbot," "smart technologies," "AI service robots," and "autonomous vehicles." Third, we created a code book as a review protocol. Fourth, we then started to search the literature and screen for inclusion. We ran a query using a combination of these keywords with key terms such as "ethics", "ethical", and "moral" in the fields related to "all fields." Then we narrowed down the sample by examining its intersection with the keywords "marketing," "service*," "consumer*", "brand*". Following that, we defined our inclusion criteria, i.e., articles that were in scope of this review. We included every article that (a) did focus on AI algorithm, design or application and (b) did discuss ethics issues or concerns. Using a keyword-based search, we identified 456 articles. After analyzing the abstracts of each article, we filtered them according to our inclusion criteria, resulting in 400 articles. All articles were then read in detail by two independent researchers, and the inclusion criteria were reapplied. This resulted in a total of 377 studies remaining. The data collection process was conducted by two independent researchers. Differences were discussed and corrected.

A qualitative synthesis was then used to analyze the papers. In keeping with Maclinnis' (2011) suggestion, we analyze the relationships between the key constructs (e.g., ethics, marketing domains, consumers) and then construct a "storyline" that integrates them. The conceptualization and concept classification of AI ethics in each discipline were derived from the existing literature. After that, the AI ethics issues that impact the marketing domain were summarized and categorized. Below is a table that summarizes the number of articles that we found on each topic.

Table 1. Number of Search Results by Topic

Topics identified by (Mariani et al, 2021)	Number of search results
memory and computational logic	51
decision making and cognitive processes	47
neural networks	11
machine learning and linguistic analysis	78

social media and text mining	27
social media content analytics	4
technology acceptance and adoption	25
big data and robots	134

4. Findings

Stahl (2021) took an ecosystem perspective and examined AI ethical issues in three different sets: those issues arising from machine learning (narrow AI), general issues related to living in a digital world and metaphysical issues arising from converging socio-technical systems. The first set of issues consists of those that come from machine learning techniques that are based on AI. The key concerns in this aspect consist of informational privacy. Concerns about data privacy are rooted in need for access to large data sets for the purpose of training. For diagnostic healthcare applications, training data will likely consist of data collected from individual patients in the course of routine clinical care, such as lab test numbers, biopsy results, and diagnostic images, or individual members of health insurance plans, along with personal demographic information. A second source of the training data might be from non-clinical outlets, such as personal devices, social media, and financial or legal sources, which may contain potentially controversial data elements. Questions were raised such as who owns the data, how much the data is worth, how much is each individual's data contribution worth and the pricing of the app itself, etc. In fact, even if there is no access to personal data, AI's ability to detect patterns may pose privacy issues (Char et al., 2020).

Concerns about data protection lie in several aspects. First of all, AI has the potential to create new data protection risks which are not yet envisaged by legislation, creating new ethical concerns. Second, it is possible that AI uses or generates new types of personal data, such as emotional data, thus further aggravating the problem (Stahl, 2021). Last, AI systems are vulnerable to new types of attacks, such as model poisoning attacks, where hackers deliberately influence the training data to manipulate the results of a predictive model. (Jagielski et al., 2018). Ironically, these systems may be used for new types of vulnerability detection and exploitation (Kraffft et al., 2020).

Issues of informational privacy and means to protect data are linked with the reliability of AI systems, because the outputs of machine learning systems depend on the quality of training data, which is difficult to ascertain (Stahl, 2021). For example, Topol (2019) suggested that even with the great promise of AI in medicine, there are relatively few AI systems in clinical practice. When used under clinical conditions, AI systems, such as IBM's Watson have performed poorly, with recommendations that could endanger patients' lives (Ross & Swetlitz, 2018).

Lucivero and Hallowell (2021) drew upon their experiences of working on two scientific projects that are based at the University of Oxford's Big Data Institute and analyzed their epistemological and ethical implications. Both of the projects assume that digital/computational tools enable the study of phenotypic aspects of disease and will open new opportunities for healthcare and health research. Therefore, they can be used to justify an approach change from the 'omics' (genomics, proteomics, metabolomics etc.) paradigm to the phenotyping paradigm. Unlike the omics paradigm which promises to uncover the secrets of disease processes by focusing on molecular processes, the phenotyping paradigm focuses on observable traits such as facial features, social and cognitive behaviors or lifestyle habits as indicators to identify disease patterns and underlying biological mechanisms. However, bias derived from the use of unrepresentative training sets is commonly acknowledged as an issue in algorithmic decision-making, as is the fact that using digital devices for data collection may discriminate against those who have less digital awareness and thus, further reinforce sampling biases. In addition, although some phenotypic data are collected from patients, patients (and their subjectivities) are still very much involved in data collection activities through their laborious practices to facilitate data collection. This implies that algorithms are neither value-neutral nor free from human assumptions and judgments and the original expectation of providing more objective data collection needs to be approached with caution. An even worse scenario is that, as phenotyping algorithms are trained, the form and structure of those datasets will determine the nature of future medicine by defining disease, or what is deemed to be 'normal' or 'pathological', and this raises ethical issues such as accountability, transparency, and trustworthiness (Lucivero & Hallowell, 2021).

Against the backdrop in which Big data and analytics are being increasingly used by tourism and hospitality organizations (THOs) to provide insights and inform critical business decisions,Yallop et al.,

2021 proposed a framework that incorporates an ethical-based approach that transcends compliance with privacy and protection laws to include other critical facets such as privacy and ethics, a fair exchange of traveler data, and a THO's ability to build trusting relationships with stakeholders in order to demonstrate its social license to operate.

Another widely discussed ethical concern related to AI is bias, i.e., machine learning can reproduce already-existing biases, either intentionally or inadvertently (Stahl, 2021). In fact, algorithmic biases and the resulting discrimination raise concerns that people are disadvantaged for reasons they should not be, for example, by giving higher credit limits to men than to women or when gender issues in recruitment are replicated through the use of the machine (Condliffe, 2019). There have been discussions focusing on the potential of machine learning to infringe the right to equality and non-discrimination (Access Now Policy Team, 2018).

Moreover, machine learning applications that incorporate perpetuated biases may have a detrimental effect on clinical decisions and support self-fulfilling prophecies. For example, the current practice of de-escalating or withholding interventions in patients with specific severe injuries or progressive conditions may imply that machine learning systems are likely to categorize such situations as nearly always fatal, thereby reducing the possibility of improving outcomes for such conditions (Char et al., 2020). It seems like a paradox: In comparison to high-quality research-grade data, real-world data may simply reinforce sub-optimal clinical practices that are not aligned with the best scientific evidence. Yet, an algorithm that overly relies on research-grade data alone could overlook important clinically relevant knowledge, lowering the quality of care (Fenton et al., 2007).

Tian et al. (2021) tested a typical deep convolutional neural network (DCNN), VGG-Face, which was trained with a face dataset rich in white faces compared to black and Asian faces. In the transfer learning result, white faces performed significantly better than any other race, similar to a well-known social bias in humans, the other-race effect (ORE). Further, when the dataset contained a larger number of white faces, the representations of those faces were more distinct, as indicated by a smaller in-group similarity and a larger representational Euclidean distance. As a result, white faces were less commonly seen in the VGG-Face's representational face space than other faces. A positive correlation was found between the distinctiveness of faces and identification accuracy, explaining the ORE observed in VGG-Face.

The second set of ethical issues is related to what Stahl (2021) called AI as converging socio-technical systems, i.e., systems which tend to involve numerous technologies, and the societal impact they cause. For instance, AI robots are now moving out of warehouses and manufacturing machinery into the marketplace and interacting with consumers on a daily basis (Mariani et al., 2021). Interactions between humans and AI, and humans and robots, are projected to be a common part of our day-to-day lives (Elliott, 2019).

Within this cluster, researchers are concerned about how consumers perceive AI applications in terms of potential ethical ramifications. It is particularly important in service industries since consumers' interactions with the service provider are vital to their experience and the bottom line of the service company. According to a study by Park et al., (2021), consumers demonstrate privacy concerns and trust toward AI technology in either a service setting with a credential attribute (e.g., a hospital) or an experience attribute (e.g., a café). Some studies have explored how consumers might feel uncomfortable interacting with a robot concierge due to its human-like qualities (e.g., Shin & Jeong, 2020; Hwang et al., 2021). There was less consumer tolerance for anthropomorphic robot concierges than caricatures, suggesting that the human likeness of a non-human feature might create discomfort (Hwang et al., 2021). With the impact of Covid19 and the social distancing protocol, consumers respond differently to the application of AI depending on both their demographics (Kim et al., 2021a) and perceived health risks (Kim et al., 2021b).

Some researchers (e.g., see Wiesea & Fristonb, 2021) were greatly concerned about the potentially transformative effects, i.e., persistent changes that significantly impact human well-being related to at least some aspects of life and society. The changes do not have to be extreme or radical (as in transformative AI), nor do they have to fundamentally alter personal preferences (in the context of transformative experience). Yet, the effect of these changes can still be far-reaching and substantial; for example, using AI to transform our way of living through applications that permeate everyday life, could affect how we perceive autonomy and privacy. Since our social reality is technically mediated and this mediation has consequences, AI can make a human's options appear or disappear without that human being aware of it, even without any conscious desire to mislead or deceive. Taking search engines, which rely heavily on AI, as an example, they could structure users' perception of reality and thus their scope of action,

even without any conscious attempts to direct users' attention.

A further key concern is the concentration of economic power (Stahl, 2021). Current AI systems rely on large computing resources and massive amounts of data. Only organizations which own or have access to such resources are well placed to benefit from AI. These large companies can then make even more profits than they did prior to the use of AI. These developments raise questions of fairness when large companies exploit user data that has been expropriated from individuals without compensation (Zuboff, 2019). When these companies use AI and big data to predict consumers' behavior and make profits from surveillance, they also utilize their insights to structure the space of action of individuals and reduce the average citizen's ability to make autonomous choices. The Netflix film "The Social Dilemma" focuses on how big social media companies manipulate users by using algorithms that encourage addiction to their platforms. It also shows how platforms collect personal data to target users with ads.

A well-established ethical concern focuses on the digital divide (McSorley, 2003). This concerns the divides between countries, genders, and ages, between rural and urban. AI can exacerbate each of these divides. Those who cannot access the underlying technology will miss the benefits. In terms of societal impact, there are concerns that digital technologies function in ways that perpetuate racial and colonial structures. In this area, several ethical concerns are outlined related to the racialization of self-aware machine intelligence (AI) (Cave & Dihal, 2020), and the colonial features in algorithmic decision-making (Mohamed et al., 2020).The third set of ethical issues associated with AI revolves around the nature of reality, the nature of being, and our ability to make sense of it (the big existential human questions). Researchers envision an establishment of super intelligence (Bostrom, 2016) when AI will outperform humans at most or all cognitive tasks, as well as develop consciousness and self-awareness (Torrance, 2012). Superhuman AI may be friendly to humans, or see us as competitors and destroy us? Speculations along this line led to questions such as whether we can hold current AIs responsible and whether there is such a thing as artificial morality (Wallach & Allen, 2008). This is a practical question because AIs can create morally relevant consequences (see, e.g., discussions over autonomous vehicle ethical decision-making in Evans et al., 2020). Bancroft (2013) pointed out that advances in computational neuroscience are producing unique, interesting, and important ethical questions. If a sufficiently detailed computational simulation of the brain is potentially operationally equivalent to an organic brain, it follows that we must consider extending protections against suffering to simulations.

While the design of AI robots is still lagging, discussing the accountability of AI robots has widely emerged in the literature. Toth et al. (2022) pointed out AI robots' decision-making mechanisms and AI robots' near-humanness. The former concerns how researchers can consider AI robots' decision-making mechanisms from an extended ethical implications perspective. Also, we need to be concerned about a question like how AI robots' different levels of decision-making capabilities affect the locus of ethical responsibility pertaining to critical incidents (e.g., in the case of autonomous vehicles). And the letter concerns about. AI robots should be designed, treated, and eventually, the ultimate question about will AI replace human beings as it evolves. In essence, this set of ethical issues concerns the relationship between AI and human beings in the future.

5. Mapping AI Ethics Issues to the Marketing Domain

Figure 1 synthesizes the ethics issues drawn from the literature review and further positions marketing as a discipline in the more relevant cluster. As discussed in the above-mentioned sections, cluster 1 reflected the ethics issues embedded within both data and algorithms. Often, the data used to train AI systems contains errors and biases, leading to unfair results. Despite the fact that machine learning algorithms can be applied across domains, they suffer from a long-standing problem of being opaque when it comes to interpreting the results. As algorithms become more prevalent, they influence a wide range of social processes, business transactions, governmental decisions, and how we make sense of ourselves and our society. This leads to the second cluster -the societal impact of AI. AI can exacerbate social inequality; for instance, low-income countries and minorities are more likely to be vulnerable to negative social impacts of AI and less likely to benefit from positive outcomes (Hagerty & Rubinov, 2019). Government and corporations are the AI adaptors, meditating the impact of AI algorithms on society through various AI-applications. The third cluster reflects ethical dilemmas regarding AI and the future of humanity. Despite the prediction that networked artificial intelligence will boost human productivity, research in this area concerns AI poses a threat to human autonomy, agency, and capabilities. There are mainly questions relating to the future

when the "singularity" (AI exceeding human capabilities) arrives. What will happen to robots when they become self-aware? Will they be entitled to rights? Could they become the ones in charge?

and need. However, this is against the cultural shifts in gender and growing recognition in many places of the multiplicity of gender (Shroeder, 2021).

At the brand level, firms use AI to interact with
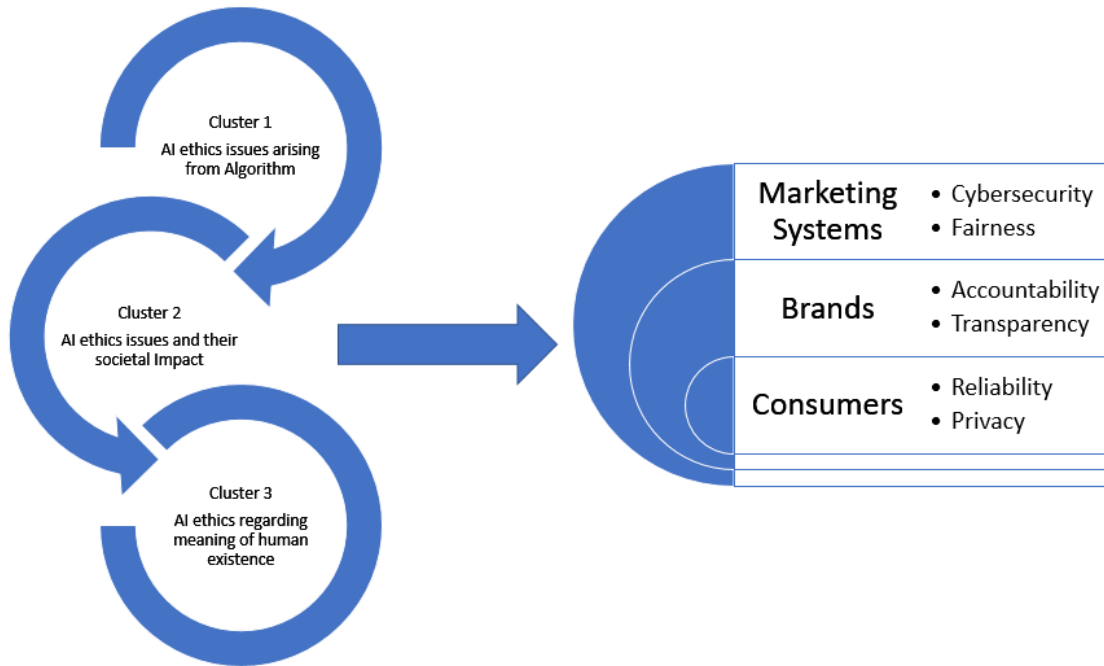
Figure 1. Conceptual Mapping

Through the review of AI ethics, we argue that AI ethics are reflected in the marketing domain at different levels. The first level refers to the market system. A marketing system is defined as a network of individuals, groups, and/or entities, embedded in a social matrix, collectively creating economic value with and for customers by offering a diverse array of goods, services, experiences, and ideas in response to or anticipating customer demand (Layton 2011). At this macro level, research has shown that the application of AI has positive economic effects in terms of productivity and international trade (e.g., Brynjolfsson et al., 2019). We are experiencing increasing automation in industries that affect us all, such as governance, energy grids, food distribution, supply chains, healthcare, fuel, and global banking. Therefore, it has become essential to make AI systems safe and fair. However, concerns around AI's influence on marketing system fairness or reliability include that AI technologies that underlie daily experience seem to be working to solidify the distinctions between males and females, and promote a dualistic realm through algorithms that depend on entrenched notions of what men and women want

trading partners in the supply chain as well as to engage consumers and predict their needs and want. For instance, the use of AI in digital marketing has become a crucial part of many companies daily operations, such as predicting what their customers may be interested in buying. Through natural language processing, the company can automatically generate product descriptions for its website based on consumers' preferences. As a result, the accountability of the AI system is directly connected to business performance in volatile consumer markets. Yet, algorithm errors in marketing harm consumers and/or violate consumers' expectations of the brand values, leading to brand harm crises and researchers' concern about brand accountability in algorithmic marketing. For example, the Google auto-complete algorithm makes incorrect defamatory associations about groups of people (Badger, 2019). When searching for certain ethnic names on Google, people get results including advertisements for bail bonds or criminal record checking (Srinivasand & Sarial-Abi, 2021). Similarly, When users noticed that the Apple Credit Card offered lower lines of credit to women than men of equal or even lower financial standing, the credit card's reputation suffered (Vigdor, 2019).

Transparency of AI, on the other hand, gives brands an idea of whether the models have been thoroughly tested and make sense and how they can understand why certain decisions have been made. This aspect has been a challenge since technical complexities perpetuate Black Box AI. Nevertheless, a transparent and customer-centric data policy that encourages customers to share information may turn these regulations from a threat into a chance, improving the trust in AI (Wang et al., 2020).

Finally, at the consumers' level, algorithmic bias can be caused by technical or computational issues, faulty algorithmic deployment or processing, or the misinterpretation of the algorithm's output, leading to unreliable product performance (Danks & London, 2017). For example, input data collected exclusively from middle-aged male casino consumers may be biased, leading to biased outputs that are implicitly biased against female consumers. Additionally, the algorithm itself may be biased, for example, if it contains a statistically biased estimator. An example would be the early stages of Google's search engine or Pandora's music recommendation system. Searching for "CEO" images on Google results in images of men, and Pandora suggests music from male musicians. In a service context, the system may likely consider a male Airbnb owner more reliable than a female owner. Hence the property will be viewed as safer. The biases reflected collectively in the data generation process reflect both structural and systemic issues as well as socio-technical issues (Suresh & Guttag, 2019). Consumer privacy is another important core area of AI ethics. Concern must be raised about potential violations of personal data and the need to protect it (Baruh & Popescu, 2017). From geolocation to health monitoring through wearable devices, online search services can help service providers to collect numerous data. Possible for the consumer to voluntarily provide their personal information in exchange for providing a convenient solution to their need, which complicates the issue. The second area of concern is the possibility that the interconnection of different data sets from the government and industry could lead to increased surveillance (Harding, 2018). As an example, facial recognition has gained popularity as a paperless ticketing solution for many mega-events. The identifier collected by facial recognition can, however, also be used for surveillance purposes. Most major cities are striving to build "smart cities" in this day and age. A sporting event is a good opportunity to gather consumer facial data and track their travel patterns.

6. Implication and Conclusion

The present study attempts to: (1) investigate the ethical issues that have been presented in (2) identify the potential impact of these ethical issues in the marketing domain as well as the role of marketing in bridging the AI technique and society. To this end, we reviewed articles in the field of computer science, as well as marketing that discuss the related topic. The research gap existing in the field of marketing at this stage is proposed on the basis of comparing the research results of the two fields. The findings of the structure review show that ethical issues identified in the AI technique have not yet been fully translated into the marketing domain, with AI application in marketing still in the infancy stage. The challenge for academics and marketers is how to develop clear programs that embrace the practical significance and societal impact of AI while mitigating the risks caused by ethical dilemmas.

Using cross-domain knowledge projections, this research discusses in depth the points marketers should pay attention to as AI is integrated into marketing. Research in academia lags, however, often behind technological advancements and marketing innovations in practice. This review enriches the discussion of ethics and technology in marketing with a focus on AI. It also provides enlightening perspectives and guidance for marketing researchers who need knowledge and relevant operational experience of machine learning algorithms.

In addition to legal and compliance matters, the proposed conceptual model highlights ethical factors that should be considered when building trust-based relationships with customers and stakeholders. Marketing and policymakers also need to cultivate a forward-looking mindset and see how ethical concerns embedded in technological innovation will translate into the practical domain. In this way, marketers will not miss the opportunity to take action proactively to address ethical issues. Considering the historical impact of marketing on societies, as well as its ubiquity and influence in today's fragile world, marketers can foster inclusive and fair ethics practices in order to embrace AI technology that can contribute to a better society.

7. Reference

Access Now Policy Team (2018) The Toronto declaration: protecting the right to equality and non-discrimination in machine learning systems. Access Now, Toronto. https://www.accessnow.org/cms/assets/uploads/2018/08/The-Toronto-Declaration_ENG_08-2018.pdf. Accessed June 10, 2022

Angst, C. M., & Agarwal, R. (2009). Adoption of electronic health records in the presence of privacy concerns: The elaboration likelihood model and individual persuasion. MIS Quarterly, 339-370

Badger, E. (2019, August 20). Who's to blame when algorithms discriminate? The New York Times. Retrieved September 11, 2022, from https://www.nytimes.com/2019/08/20/upshot/housing-discrimination-algorithms-hud.html

Bancroft, T. D. (2013). Ethical Aspects of Computational Neuroscience. *Neuroethics, 6*(2), 415-418.

Boddington, P. (2017). Towards a code of ethics for artificial *intelligence* (pp. 27-37). Cham: Springer.

Bostrom N (2016) *Superintelligence: paths, dangers, strategies*, Reprint edn. Oxford University Press, Oxford and New York

Brynjolfsson, E., Hui, X., & Liu, M. (2019). Does machine translation affect international trade? Evidence from a large digital platform. *Management Science*, *65*(12), 5449-5460.

Castillo, D., Canhoto, A. I., & Said, E. (2021). The dark side of AI-powered service interactions: Exploring the process of co-destruction from the customer perspective. *The Service Industries Journal*, *41*(13-14), 900-925.

Cave, S., & Dihal, K. (2020). The whiteness of AI. *Philosophy & Technology*, *33*(4), 685-703.

Char, D. S., Abràmoff, M. D., & Feudtner, C. (2020). Identifying ethical considerations for machine learning healthcare applications. *The American Journal of Bioethics, 20*(11), 7-17.

Condliffe, J. (2019). The week in tech: algorithmic bias is bad. Uncovering it is good. *The New York Times. Retrieved from https://www.nytimes.com/2019/11/15/technology/algorithmic-ai-bias.html* . Accessed June 10 2022

Danks, D., & LondoDanks, D., & London, A. J. (2017, August). Algorithmic Bias in Autonomous Systems. In IJCAI (Vol. 17, pp. 4691-4697).

Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science*, *48*(1), 24-42.

Du, S., & Xie, C. (2021). Paradoxes of artificial intelligence in consumer markets: Ethical challenges and opportunities. *Journal of Business Research*, *129*, 961-974.

Elliott, A. (2019). The culture of AI: Everyday life and the digital revolution. Routledge:London, UK,

Evans, K., de Moura, N., Chauvier, S., Chatila, R., & Dogan, E. (2020). Ethical decision making in autonomous vehicles: The AV ethics project. *Science and Engineering Ethics, 26*(6), 3285-3312.

Hagerty, A., & Rubinov, I. (2019). Global AI ethics: a review of the social impacts and ethical implications of artificial intelligence. arXiv preprint arXiv:1907.07892.

Huang, M. H., & Rust, R. T. (2018). Artificial intelligence in service. Journal of Service Research, 21(2), 155-172.

Huang, M. H., & Rust, R. T. (2021). Engaged to a robot? The role of AI in service. *Journal of Service Research*, *24*(1), 30-41.

Jagielski M, Oprea A, Biggio B et al. (2018) Manipulating machine learning: poisoning attacks and countermeasures for regression learning. In: 2018 IEEE symposium on security and privacy(SP), San Francisco. https://doi.org/10.1109/SP.2018.00057

Kim, J. J., Kim, I., & Hwang, J. (2021). A change of perceived innovativeness for contactless food delivery services using drones after the outbreak of COVID-19. *International Journal of Hospitality Management*, *93*, 102758.

Kim, S. S., Kim, J., Badu-Baiden, F., Giroux, M., & Choi, Y. (2021). Preference for robot service or human service in hotels? Impacts of the COVID-19 pandemic. *International Journal of Hospitality Management*, *93*, 102795.

Krafft T, Hauer M, Fetic L et al (2020) From principles to practice: an interdisciplinary framework to operationalize AI ethics. VDE and Bertelsmann Stiftung. https://www.ai-ethics-impact.org/resource/blob/1961130/c6db9894ee73aefa489d6249f5ee2b9f/aieig%e2%80%94report%e2%80%94download-hb-data.pdf . Accessed June 10 2022

Lucivero, F., & Hallowell, N. (2021). Digital/computational phenotyping: What are the differences in the science and the ethics?. *Big Data & Society, 8*(2), 20539517211062885.

Mariani, M. M., Perez-Vega, R., & Wirtz, J. (2022). AI in marketing, consumer research and psychology: A systematic literature review and research agenda. *Psychology & Marketing*, *39*(4), 755-776.

Mohamed, S., Png, M. T., & Isaac, W. (2020). Decolonial AI: Decolonial theory as sociotechnical foresight in artificial intelligence. *Philosophy & Technology*, 33(4), 659-684.

Mustak, M., Salminen, J., Plé, L., & Wirtz, J. (2021). Artificial intelligence in marketing: Topic modeling, scientometric analysis, and research agenda. *Journal of Business Research*, 124, 389-404.

Nilsson, N. J. (2009). The quest for artificial intelligence. Cambridge University Press.

Tian, J., Xie, H., Hu, S., & Liu, J. (2021). Multidimensional face representation in a deep convolutional neural network reveals the mechanism underlying AI racism. *Frontiers in Computational Neuroscience, 15*, 620281.

Topol EJ (2019) High-performance medicine: the convergence of human and artificial intelligence. *Nat Med* 25:44–56. https://doi.org/10.1038/s41591-018-0300-7

Torrance, S. (2012). Super-intelligence and (super-) consciousness. *International Journal of Machine Consciousness, 4*(02), 483-501.

Tóth, Z., Caruana, R., Gruber, T., & Loebbecke, C. (2022). The Dawn of the AI Robots: Towards a New Framework of AI Robot Accountability. *Journal of Business Ethics*, 1-22.

MacInnis, D. J. (2011). A framework for conceptual contributions in marketing. *Journal of Marketing*, *75*(4), 136-154.

McSorley, K. (2003). The secular salvation story of the digital divide. *Ethics and Information Technology, 5*(2), 75-87.https://doi.org/10.1023/A:1024946302065

Morley, J., Floridi, L., Kinsey, L., & Elhalal, A. (2020). From what to how: an initial review of publicly available AI ethics tools, methods and research to translate principles into practices. *Science and Engineering Ethics*, *26*(4), 2141-2168.

Morley, J., Elhalal, A., Garcia, F., Kinsey, L., Mökander, J., & Floridi, L. (2021). Ethics as a service: a pragmatic operationalisation of AI ethics. *Minds and Machines*, *31*(2), 239-256.

Ross, C. & Swetlitz, I. IBM's Watson supercomputer recommended 'unsafe and incorrect' cancer treatments, internal documents show. In Stat News https://www.statnews.com/2018/07/25/ibm-watson-recommended-unsafe-incorrect-treatments/ (2018).

Park, S. S., Tung, C. D., & Lee, H. (2021). The adoption of AI service robots: A comparison between credence and experience service settings. *Psychology & Marketing*, *38*(4), 691-703.

Rangaswamy, A., Moch, N., Felten, C., Van Bruggen, G., Wieringa, J. E., & Wirtz, J. (2020). The role of marketing in digital business platforms. *Journal of Interactive Marketing*, 51, 72-90.

Stahl, B. C. (2021). *Artificial intelligence for a better future: an ecosystem perspective on the ethics of AI and emerging digital technologies*. Springer Nature.

Siau, K., & Wang, W. (2020). Artificial intelligence (AI) ethics: ethics of AI and ethical AI. *Journal of Database Management (JDM)*, *31*(2), 74-87.

Schroeder, J. E. (2021). Reinscribing gender: social media, algorithms, bias. *Journal of Marketing Management*, *37*(3-4), 376-378.

Srinivasan, R., & Sarial-Abi, G. (2021). When algorithms fail: Consumers' responses to brand harm crises caused by algorithm errors. *Journal of Marketing*, *85*(5), 74-91.

Sterne, J. (2017). Artificial intelligence for marketing: practical applications. John Wiley & Sons: Hoboken, NJ.

Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and research*, *39*(1), 93-112.

Vlačić, B., Corbo, L., e Silva, S. C., & Dabić, M. (2021). The evolving role of artificial intelligence in marketing: A review and research agenda. *Journal of Business Research*, 128, 187-203.

Verbeek, P. P. (2014). Some misunderstandings about the moral significance of technology. In *The moral status of technical Artefacts* (pp. 75-88). Springer, Dordrecht.

Verbeek, P. P. (2011). *Moralizing technology: Understanding and designing the morality of things*. University of Chicago press.

Wallach W, Allen C (2008) *Moral machines: teaching robots right from wrong*. Oxford University Press, New York

Wang, Y., Xiong, M., & Olya, H. (2020, January). Toward an understanding of responsible artificial intelligence practices. In *Proceedings of the 53rd hawaii international conference on system sciences* (pp.

4962-4971). Hawaii International Conference on System Sciences (HICSS).

Wiese, W., & Friston, K. J. (2022). AI ethics in computational psychiatry: From the neuroscience of consciousness to the ethics of consciousness. Behavioural Brain Research, 420, 113704. https://doi.org/10.1016/j.bbr.2021.113704

Williams, J., & Aitken, R. (2011). The service-dominant logic of marketing and marketing ethics. *Journal of Business Ethics*, *102*(3), 439-454.

Zuboff, S. (2019). *The age of surveillance capitalism: The fight for a human future at the new frontier of power: Barack Obama's books of 2019*. Profile books.

Zhu, D. H., & Chang, Y. P. (2020). Robot with humanoid hands cooks food better? Effect of robotic chef anthropomorphism on food quality prediction. *International Journal of Contemporary Hospitality Management, 32(3), 1367-1383.*

Vigdor, N. (2019, November 10). Apple card investigated after gender discrimination complaints. The New York Times. Retrieved September 11, 2022, from https://www.nytimes.com/2019/11/10/business/Apple-credit-card-investigation.html

Yallop, A.C., Gică, O.A., Moisescu, O.I., Coroș, M.M., Séraphin, H., 2021. The digital traveller: implications for data ethics and data governance in tourism and hospitality. *Journal of Consumer Marketing* ahead-of-print. https ://doi.org/10.1108/JCM-12-2020-4278