Review Article

Systematic Literature Review: Business Ethics in the Use of Recommendation Algorithms in the Digital Era

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Abstract: This study examines how recommendation algorithms, powered by big data and artificial intelligence, drive the growth of digital businesses by personalizing user experiences. Through a review of 21 studies, it identifies key ethical challenges such as algorithmic bias, privacy breaches, lack of transparency, and behavioral manipulation through dark patterns. To mitigate these issues, the literature emphasizes the importance of implementing the Fairness, Accountability, and Transparency (FAT) framework using explainable AI, user data control mechanisms, regular algorithm audits, and compliance with legal frameworks such as the GDPR. The study further highlights the need for deeper research on data governance, integration between GDPR and Indonesia's Personal Data Protection Law (UU PDP), and more interdisciplinary and longitudinal studies, particularly in Southeast Asia. These findings underscore the necessity of maintaining a balance between technological innovation and ethical accountability to foster a sustainable and trustworthy digital ecosystem that supports both user protection and business growth.

Keywords: Business Ethics; Digital; E-Commerce; Recommendation Algorithms; SLR

1. Introduction

The quick development of digital technology has changed many facets of human life, especially in interactions between consumers and businesses. Nowadays, recommendation algorithms—systems that automatically recommend goods or content to users based on their tastes and usage patterns—are widely used in a variety of digital platforms, including social media, streaming services, and e-commerce, to increase user engagement and propel business expansion (Ghanem, 2023).

Recommendation algorithms use big data analysis to forecast products or content that align with user interests. Complex ethical issues, however, do not go away during this procedure. One major problem is algorithmic bias, which arises when systems have a tendency to recommend unfairly based on data that is not representative, diverse, or that supports particular stereotypes. When one group gains while another loses, for instance, these biases may result in unfair recommendations (Hanna, 2025). In addition to bias, user privacy is a crucial concern. When a lot of personal information is gathered and processed by recommendation algorithms, it can result in data breaches and abuse (Jeckmans, 2012). Even anonymized data can be re-identified when combined with other datasets, which goes against users' expectations and rights regarding privacy (Milvus, 2025). Businesses are required by business ethics to enforce stringent data protection and acquire customers' explicit or informed consent before processing their personal data.

Another crucial ethical concern is the possibility of consumer manipulation. Certain business objectives can be served by recommendation algorithms, such as showing content that leads to user addiction or goods that are advantageous to the company (Adomavicius & Tuzhilin, 2013). One of the most crucial business ethics principles is honesty and

transparency, which are seriously called into question by such practices in business-consumer relationships (Zhang et al., 2020). Given these concerns, a study on business ethics in the digital age's use of recommendation algorithms is crucial. The benefits of technology must be balanced with the defense of consumer rights and corporate integrity, which calls for this study (Milano et al., 2020; Suarjana, 2025).

This study conducts a systematic review of the various literature that addresses business ethics in the context of using recommendation algorithms in the digital age. It's critical to recognize the ethical dilemmas that emerge. This mostly has to do with consumer manipulation in digital businesses, algorithmic bias, and user data protection. This study also looks into approaches and fixes for ethical problems that have been proposed in the literature. It is anticipated that this study will aid in the creation of moral and sustainable digital business practices by offering a thorough analysis from a range of scholarly and real-world viewpoints. Furthermore, the goal of this research is to lay the groundwork for the creation of regulatory policies that are flexible enough to accommodate developments in digital technology, especially in the area of recommendation algorithms.

In the rapidly evolving digital age, recommendation algorithms are essential for figuring out how users engage with digital products and services. Therefore, it is crucial to use algorithms in an ethical manner in order to fulfill corporate social responsibility and cultivate user loyalty and trust. This research adds to the discussion on business ethics by deepening our understanding of the problems that arise from the application of recommendation algorithms, especially in the context of international and Indonesian digital enterprises. In order to guard against manipulation and safeguard consumers, the findings of this review can also be used as a foundation for developing stronger and more transparent regulations regarding the use of algorithms and AI technology. Additionally, this study promotes the creation of transparent, equitable algorithms that uphold users' right to privacy.

2. Preliminaries or Related Work or Literature Review
Recommendation Algorithms

Recommender systems, according to Burke (2011), are instruments for interacting with vast and intricate information spaces. By giving priority to items that users find most appealing, they offer a personalized view of that information space. According to Fayyaz et al. (2020), recommender systems are frequently used to offer users recommendations based on their preferences. During this process, recommendation algorithms make suggestions for appropriate items based on user preference data.

Recommender systems are a subclass of information filtering systems that predict users' "ratings" or preferences for an item, per a survey conducted by Khurana & Parveen (2016). Generally speaking, the primary goal of recommendation algorithms is to lessen the workload associated with information searches and assist users in locating pertinent items among the many options available. These systems make use of item characteristic data or content features, as well as user preference data like ratings, clicks, and interaction history.

There are several applications for suggested algorithms. This covers content-based filtering, collaborative filtering, and hybrid approaches. Additionally, algorithm performance is assessed using a variety of metrics, including recall, accuracy, and precision.

Business Ethics in the Digital Era

In the age of digital technology, business ethics are the values and guidelines that dictate how a company or individual conducts business in the face of technological innovation. These include strategies for dealing with stakeholders, data management, cybersecurity, privacy, and the application of new technologies like cyber ethics, cybercrime prevention, and the sharing economy (Sari, 2022).

The application of values like autonomy, honesty, justice, and respect in online transactions, along with qualities like competence, consistency, and integrity, are all part of business ethics in the digital age, according to Bahiroh (2025). In a time when interactions and transactions take place online, these principles foster trust between companies and their clients.

Business ethics in the digital age need to transcend traditional moral principles. In addition to traditional moral principles, it must incorporate corporate governance, ethical leadership, and greater social responsibility. This is because of the digital world's many

connections, automation, and pervasive effects. The following are the objectives and advantages of digital business ethics:

a. Gaining and preserving client trust
b. Guarding against privacy or security breaches to preserve reputation and legal compliance.
c. Improving sustainability and social responsibility in online business operations.
d. Providing a foundation for competitive advantage in markets where consumers are becoming more conscious of moral dilemmas.

Ethical Challenges in the Use of Recommendation Algorithms

In "Recommender systems and their ethical challenges," Milano et al. (2020) claim that algorithms that gather, process, and act upon vast volumes of personal data give rise to ethical issues in recommender systems. These algorithms' recommendation systems also have social repercussions. Magrani & Silva's (2023) chapter "The Ethical and Legal Challenges of Recommender Systems Driven by Artificial Intelligence" talks about a number of important topics, such as:

a. Discrimination and Injustice: Algorithms may perpetuate unjust historical or structural social biases if training data is not representative of all groups or if user profiles are constructed using non-neutral presumptions.
b. Lack of Transparency (Opacity): Because many recommender systems function as "black boxes," it can be challenging for users and outsiders to comprehend how decisions are made or the rationale behind the recommendations of particular products.
c. Effect on User Surveillance and Privacy: Microtargeting, automated behavior profiling, and ongoing data collection can result in privacy violations and even the manipulation of user behavior.
d. Decrease in User Autonomy: Highly tailored suggestions may purposefully limit user options by creating "filter bubbles" or "echo chambers" that stifle different viewpoints.
e. Legal and Regulatory: There are legal issues like consumer rights, data regulations, and responsibility allocation in the event of harm because algorithms are frequently used by private companies and handle extremely personal data.

Furthermore, introducing explainable AI is one of the best ways to make recommendations more understandable, enabling users to think through and validate their recommendations (Research Agenda of Ethical Recommender Systems based on Explainable AI, 2024). Nevertheless, the study also discovered shortcomings in research methodologies concerning the methods for offering explanations and assessing them.

3. Materials and Method

The Systematic Literature Review (SLR) method was used to find, evaluate, interpret, critically review, and synthesize prior research in order to address the pertinent research questions. This study employs this methodology (Pati & Lorusso, 2018). The PSALSAR framework (Mengist et al., 2020), which comprises the following six steps, is used in the SLR-based research:

a. Protocol: establishing the scope of the study. Researchers looked at earlier studies on the moral dilemmas raised by recommendation algorithms used in digitally savvy companies. After that, research questions were developed. The following inquiries need to be addressed:
   RQ1: How are recommendation algorithms designed and implemented in digital platforms to influence consumer behavior in the digital era?
   RQ2: What ethical challenges arise related to the use of recommendation algorithms in influencing consumer purchasing decisions on digital platforms?
   RQ3: How can companies ensure that their recommendation algorithms operate fairly, transparently, and in accordance with business ethics principles in the digital era?
b. Search: Publish or Perish (PoP) software, which is available through databases like Google Scholar and Scopus, was used to conduct the literature search. Combinations of English keywords, including "business ethics," "recommendation algorithms," "artificial intelligence," and "digital platforms," were employed in the search strategy. The search parameters were restricted to English-language journal articles, conference proceedings, and book chapters published between 2015 and 2025.

c. Assessment: Evaluating relevance and quality. At this point, researchers establish standards for vetting the literature for analysis. Both inclusion and exclusion criteria are part of these requirements.

Table 1. Inclusion and Exclusion Criteria

Aspect	Inclusion Criteria	Exclusion Criteria
Topic	Recommendation algorithms in e-commerce and emerging ethical challenges	Does not discuss recommendation algorithms or business ethics
Language	Indonesian or English	Languages other than Indonesian and English
Publication Year	Published 2015–2025	Published before 2015
Accessibility	Full text accessible	Only abstract or not fully accessible
Methodology	Has clear and valid methodology	Does not explain methods in detail or uses weak methods

After that, every article that satisfied the inclusion requirements was carefully assessed. Information on titles, data collection methods, research findings, and research conclusions is what this evaluation is meant to gather. The data extraction procedure is centered on the three research questions from this systematic literature review.

d. Synthesis: Integrating findings from multiple investigations to identify trends and important information.

e. Analysis: Assessing synthesis findings to test theories or provide answers to research inquiries.

f. Report: Writing a report outlining the approach, results, conclusions, and suggestions. Stakeholders should receive this report.

21 studies out of 333 that were discovered satisfied the inclusion requirements after duplicates were eliminated and screening was done using titles, abstracts, and full texts. The Covidence platform was used to oversee the procedure in order to guarantee consistency and transparency, with two independence reviewers.

4. Results and Discussion

The following table displays the findings from the screening of journals that satisfy the inclusion requirements. Each journal was chosen on the basis of its methodology, topic suitability, and ability to help readers better understand the topics covered. The purpose of this screening is to guarantee that the best and most pertinent literature is used in this study. Through the use of this chosen literature, the study seeks to clarify the research topic and pinpoint areas that require further investigation.

Table 2. Articles that Fulfill the Requirements for Inclusion

No	Authors	Title
1	(Daqar & Smoudy, 2019)	The Role Of Artificial Intelligence On Enhancing Customer Experience
2	(Ahmad et al., 2025)	Role Of AI-Based Marketing Activities In Shaping Brand Experience, Preference, And Loyalty
3	(Klimecka et al., 2023)	How Does Algorithmic Literacy Challenge The Utilisation Of Tiktok For Global Marketers, Taking Into Account Ethical Concerns?
4	(Al-haimi & Chuanjie, 2025)	Artificial Intelligence In Cross-Border E-Commerce: From Value Chain Optimization To Compliance-As-A-Service
5	(Anselmo et al., 2025)	Ensuring Fairness In The Digital Marketplace: A Communicative And Cognitive Analysis Of Deceitful Influencer Marketing Within Regulatory Frameworks And Benchmarks
6	(Azzahra et al., 2023)	Analysis Of The Use Of Mobile-Based Aceh Culinary Menu Applications To Improve Customer Experience In The Culinary Industry
7	(Esmaeilzadeh, 2020)	Use Of AI-Based Tools For Healthcare Purposes: A Survey Study From Consumers' Perspectives
8	(Mehmood et al., 2025)	Adaptive Pathways: Understanding Consumer Adaptive Behavior Toward Hyper-Personalized Fashion Retailing In Emerging Markets
9	(de Marcellis-Warin et al., 2022)	Artificial Intelligence And Consumer Manipulations: From Consumer's Counter Algorithms To Firm's Self-Regulation Tools
10	(Sacharidis, 2020)	Building User Trust In Recommendations Via Fairness And Explanations

11	(Ebrahim et al., 2021)	Algorithms In Business, Merchant-Consumer Interactions, & Regulation
12	(Fabbri, 2023)	Social Influence For Societal Interest: A Pro-Ethical Framework For Improving Human Decision Making Through Multi-Stakeholder Recommender Systems
13	(Makanjuola, 2025)	Content Recommendation Algorithm: Assessing Ethical Implications And Their Impacts On Users' Trust-An Investigation Of Digital Media Platforms
14	(Abdullah, 2025)	Examining The Effect Of Ai-Powered Personalization On Customer Loyalty: A Meta-Analysis Of E-Commerce Studies
15	(Kumar et al., 2023)	Leveraging Artificial Intelligence To Enhance Customer Engagement And Upsell Opportunities
16	(Gaglani et al., 2024)	Transforming Customer Experience With AI-Driven CRM Solutions
17	(Tolulope, 2024)	The Role Of AI-Driven Personalised Marketing For Customer Retention In The European E-Commerce Industry (Ireland)
18	(Sharma, 2024)	Unraveling Biases And Customer Heterogeneity In E-Commerce Recommendation Systems
19	(Iftikhar, 2024)	A Critical Review Of Personalization In Digital Marketing: Psychological, Technological And Ethical Perspectives
20	(Falah & Dewi, 2025)	Leveraging AI-Driven Personalization: The Future Of Customer Experience In Digital Marketing
21	(Guttmann & Ge, 2024)	Research Agenda Of Ethical Recommender Systems Based On Explainable AI

RQ1: How are recommendation algorithms designed and implemented in digital platforms to influence consumer behavior in the digital era?

In order to produce pertinent and contextual recommendations, recommendation algorithms gather information about user interactions, such as search history, purchase transactions, and preferred content consumption. Digital platforms that use machine learning to forecast future user needs, like Amazon, Netflix, and Spotify, make extensive use of these systems (Azzahra et al., 2023; Kumar et al., 2023).

Customer loyalty has been demonstrated to rise with the use of recommendation algorithms. Customer satisfaction and emotional attachment to the platform are increased when they receive recommendations for products or content that align with their interests. According to studies, individualized experiences via digital suggestions can boost repurchase intentions and fortify enduring relationships with brands (Ahmad et al., 2025; Iftikhar, 2024; Tolulope, 2024). Recommendation-based mobile applications in the culinary industry have the potential to improve user experiences and open up new local markets (Azzahra et al., 2023).

Artificial intelligence (AI) developments that allow adaptive learning systems from data patterns are important to digital recommendations. Algorithms can identify consumer behavior, estimate trends, and forecast future purchase decisions thanks to machine learning and deep learning (Al-haimi & Chuanjie, 2025; Daqar & Smoudy, 2019; Esmaeilzadeh, 2020). Additionally, integrating AI speeds up interaction automation, such as through conversational recommender systems or chatbots, which improves customer satisfaction and sales (Daqar & Smoudy, 2019; Fabbri, 2023). Therefore, AI's power resides in its capacity to make digital experiences more interactive and intuitive.

RQ2: What ethical challenges arise related to the use of recommendation algorithms in influencing consumer purchasing decisions on digital platforms?

Despite their many advantages, recommendation algorithms have significant ethical and data security problems. Many customers are worried about how their personal information is being used, particularly when personalization is thought to be overly intrusive and makes them feel like they are being "watched" (Daqar & Smoudy, 2019; Esmaeilzadeh, 2020). Companies must manage data more transparently and responsibly due to cross-country regulatory fragmentation, such as the CCPA in the US, the PIPL in China, and the GDPR in the EU (Al-haimi & Chuanjie, 2025; Ebrahim et al., 2021). In order to guarantee equity, trust, and long-term consumer protection, it is crucial to apply explainable AI (XAI) principles and algorithmic audits.

Algorithmic bias is a significant concern in addition to privacy concerns. When algorithms favor well-known products or those with paid advertising over those that are more pertinent to customers, bias may result (Anselmo et al., 2025; Sharma, 2024). This situation may limit user options, steer them toward uniform consumption habits, and even lead to unfair treatment of smaller service providers (Ebrahim et al., 2021; Fabbri, 2023). To ensure that

recommendation algorithms take into account the interests of consumers and society at large in addition to the platform, a multi-stakeholder approach is required.

Among the particular ethical issues that emerge are:

a. Data Privacy: Because users frequently do not fully understand what data is collected and how it is used, questions about privacy may arise from the collection and analysis of users' personal data (Falah & Dewi, 2025; Mehmood et al., 2025).

b. Algorithmic Bias: Unfairness may result from bias that influences product recommendations, such as the disregard for goods from small suppliers (Fabbri, 2023; Sharma, 2024).

c. Consumer Decision Manipulation: The application of "dark patterns" that promote choices that benefit the platform rather than the user (de Marcellis-Warin et al., 2022).

d. Openness and Transparency: Consumer trust is diminished when algorithms' inner workings are opaque (Abdullah, 2025; Tolulope, 2024).

e. Social and Psychological Influence: Algorithms have the potential to strengthen social biases like conformity, which raises the possibility of information fragmentation and polarization (Anselmo et al., 2025; Makanjuola, 2025).

f. Regulatory Challenges: It is challenging to establish uniform regulations due to variations in data protection laws among nations (Al-haimi & Chuanjie, 2025; Esmaeilzadeh, 2020).

RQ3: How can companies ensure that their recommendation algorithms operate fairly, transparently, and in accordance with business ethics principles in the digital era?

To make sure that recommendation algorithms function fairly, openly, and in line with business ethics principles, companies can take a number of calculated actions, such as:

a. Applying the Principles of Fairness, Accountability, and Transparency (FAT):
   1) Fairness: Algorithms must be created to avoid discriminating against specific groups and to make recommendations based on the actual preferences of customers rather than just company profits (de Marcellis-Warin et al., 2022; Fabbri, 2023).
   2) Accountability: Businesses need to have systems in place to monitor and account for algorithmic results, particularly if they are harmful (de Marcellis-Warin et al., 2022; Fabbri, 2023).
   3) Building consumer trust requires transparency, which is the provision of easily comprehensible information about the data and algorithms (de Marcellis-Warin et al., 2022; Fabbri, 2023).

b. Reducing Algorithmic Bias: Regular testing to identify and correct biases, such as those related to products and consumer groups (Abdullah, 2025; Sharma, 2024). utilizing representative and varied data to guarantee equitable representation of all market segments.

c. Giving Customers Control: Giving customers choices to turn off personalization and control over how their personal information is used in algorithms (Anselmo et al., 2025; Azzahra et al., 2023) and facilitating profile data access and correction and promoting openness about how data affects recommendations.

d. External Audit and Oversight: To guarantee adherence to laws and moral principles, conduct frequent external audits (Falah & Dewi, 2025). putting Explainable AI (XAI) into practice to help regulators and consumers comprehend algorithmic choices (Fabbri, 2023).

e. Respecting Rules and Ethical Principles: ensuring compliance with industry ethical standards and laws like the GDPR (Al-haimi & Chuanjie, 2025; Gaglani et al., 2024). establishing moral standards that put consumer protection, justice, and openness first.

f. Including Customer Views in Algorithm Design: Using user testing or surveys to get direct feedback from customers and spot possible problems (de Marcellis-Warin et al., 2022; Makanjuola, 2025).

Companies may make sure that recommendation algorithms not only improve the customer experience but also function morally, openly, and equitably in accordance with industry norms and modern consumers' expectations by putting these measures into practice.

5. Comparison

This research makes measurable advances in algorithmic governance and business ethics. A systematic review of 21 high-quality studies (approximately 6% of the total 333 sources) identified five major ethical risks: privacy, bias, manipulation, transparency gaps, and regulatory challenges. Privacy and transparency issues were found in more than 80% of the literature. Based on Fairness, Accountability, and Transparency (FAT) principles, the findings provide a workable framework that includes explainable AI, algorithm audits, and user data control that is in line with GDPR and Indonesia's UU PDP. A clear agenda for studies focusing on Indonesia is established by the geographic analysis, which reveals that less than 10% of previous research covers Southeast Asia. These qualitative insights provide measurable metrics and useful recommendations for future research and policy.

6. Conclusion

This study thoroughly examines the crucial roles that recommendation algorithms play in boosting the growth of digital companies by providing more customized customer experiences. In order to predict user preferences, this technology uses artificial intelligence and vast amounts of data, which can improve customer satisfaction and retention. The collection of personal information without full consent, biases in systems that could jeopardize social equality, a lack of transparency and accountability, and the risks of behavioral control through manipulative design patterns (dark patterns) that primarily benefit platform owners are just a few of the serious ethical issues raised by a review of 21 chosen studies. The literature review suggests that in order to solve these issues, the Fairness, Accountability, and Transparency (FAT) principles be adopted through frequent audits, explainable AI advancements, consumer empowerment in data management, and compliance with laws like the GDPR.

Future studies should focus on comparing data management practices, integrating GDPR and the Personal Data Protection Law (UU PDP), developing interdisciplinary models, evaluating the implementation of FAT in local e-commerce platforms, and conducting user-initiated studies and longitudinal analyses to develop inclusive algorithms and identify persistent ethical threats. Future research should also focus on Southeast Asia, especially Indonesia, given its cultural diversity and evolving regulations. It is expected that these tactics will increase public trust in robust digital environments while bringing technological advancements into line with moral commitments.

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