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Artificial Intelligence and Consumer Behavior: A Bibliometric Review and Future Research Directions

Nida Aslam Khan[1]*, Asim Qazi[2], Ubedullah Khoso[1]

Abstract: *Artificial intelligence (AI) has altered business activities and their processes of evaluating consumer experiences and mapping their purchase journey. Myriad classes of big data have been employed along with diverse modes of investigation using machine learning. The research aims to review the studies on AI and consumer behavior (CB) identify the trends, patterns, and gaps in the research and present the future research agenda. By using a comprehensive dataset of 398 articles extracted from Scopus, we employ a hybrid review approach that includes statistical methods to analyze bibliographic data and a critical review of state-of-the-art literature on CB and AI. The results reveal four major literature streams: 1) AI and its role in consumer choices, 2) Emerging technology in AI and CB, 3) AI and consumer feedback, and lastly 4) AI and consumer service. Furthermore, the authors highlight future directions broadly focusing on the impact of external variables on consumer choices and integrating technologies to build strong company-consumer relationships. This is one of the first reviews that present the themes of artificial intelligence in CB according to their distinct levels of impact and propose directions for further research.*

Keywords: Artificial Intelligence, Consumer Behavior, Bibliometrics, Meta-literature review, Content Analysis.

Introduction

As a transformative general-purpose technology, AI has changed our world. AI evolves from interactions, unlike other technologies. AI is becoming more successful and widespread (McAfee & Brynjolfsson, 2017). AI can now construct self-learning, human-independent algorithms. AI is increasingly expanding beyond computation to different areas and devices (Makridakis, 2017; Zhang et al., 2021). Smartphones improve our daily life, but chatbots change customer service (Belanche et al., 2021; Lu et al., 2020; Wirtz, 2018). It challenges artistic preconceptions in journalism (Carlson, 2016), painting (Quackenbush, 2018), and music (Marshall, 2018). In marketing and other human-centric industries, AI algorithms are transforming consumer experiences (Sterne, 2017). The rapid spread of AI indicates its revolutionary potential.

AI and other disruptive technologies change customer behavior. AI in e-commerce has

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changed consumer behaviour (Khrais, 2020; Nichifor, Trifan, & Nechifor, 2021). Companies influence customer purchases and behaviour with AI (Hironde, 2023). Predictive AI can help organizations anticipate customer requirements and personalize products, increasing customer loyalty (Wirtz, et al., 2018). Cognitive neural networks are helping AI grasp customer personalities and behave instinctively and empathetically (Huang & Rust, 2018; Pakkala & Spohrer, 2019; Leone et al., 2021). Market automation uses AI like machine learning (Sheth, 2021; Toubes et al., 2021). This transformation impacts customer marketing and behavior (Kleber, 2018; Sterne, 2017).

AI research has expanded to include education, HRM, blockchain, smart healthcare, big data, and marketing (Bahroun et al., 2023; Kaushal et al., 2023; Kumar et al., 2022; Chen et al., 2023; Agustí & Orta-Pérez, 2023) and marketing. Mariani et al., (2022) depicted how AI technologies effect marketing, consumer research, and psychology customer behavior beyond our review. The writers studied broader research topics, while we studied customer behavior. Considering AI's importance and exceptional growth, much research has been conducted in various domains, resulting in more bibliometric and systematic reviews to summarise the body of knowledge and map the future research agenda, i.e., AI in educational settings (Bahroun et al., 2023), AI and HRM (Kaushal et al., 2023), AI and blockchain (Kumar et al., 2022), AI and smart healthcare (Chen et al., 2023), AI and big data(Agustí & Orta-Pérez, 2023) and AI in marketing, consumer research and psychology (Mariani et al., 2022). While reviewing, we found three relevant studies (Mariani et al., 2022; Rabby et al., 2021; Jain et al., 2023) on the subject at hand, however these studies did not address the specific research gap outlined above as they differ from our study in terms of their focus, scope, methodology, data collection, and contributions. Mariani et al., (2022) focuses on the intersection of AI with marketing, consumer research, and psychology, with a wider focus than our review, concentrating specifically on the relationship between AI technologies and CB. While Mariani et al., (2022) explored broader research themes, whereas the themes identified in our article are strictly integrated with CB constructs.

On the other hand, Rabby et al., (2021) has an even finer lens, mainly focusing on integrating AI and digital marketing and its influence on CB and it provides an integrative literature review, skipping specified studies more relevant to topic. While our review encompasses studies related to digital marketing and CB, by comprehensively analyzing the interplay of AI and CB. Both Mariani et al., (2022) and our study adhered to a systematic literature review (SLR) approach to cover all articles published in their respective areas. Yet, our focus is beyond conventional SLR, as we also integrate bibliometric methods to analyze and synthesize literature into core components.

Due to above mentioned variances in terms of focus, scope and methodology, the findings and contributions of this research are different from previous studies and contribute of body of knowledge through identification of research fronts and future research directions with a specific focus on AI and CB scholars. CB research stands at the forefront, poised to unravel and advance our understanding of the intricate relationship between AI and CB. Through a comprehensive literature analysis, we underscore the imperative for a cutting-edge overview that serves as the linchpin for the AI and CB research domain. The rationale behind this research is grounded in the escalating influence of AI on consumer CB, with far-reaching implications for individual consumers,

brands, and society at large. This review is important to know more about how AI shapes consumers' behavior. It also adds to theoretical development of the AI CB field via emerging trends, themes and future research directions to facilitate researcher to advance the knowledge of the interplay between AI and CB. This bibliometric review examines AI-CB literature to bridge this knowledge gap.

This bibliometric review addresses the following research question:

RQ1: What is the year-by-year publishing pattern for AI and CB research?
RQ2: Which authors, countries, journals, and universities/institutes excel in AI and CB research?
RQ3. What are the main AI and CB research themes?
RQ4. What are AI and CB research directions?

To address these issues and present a forward-looking philosophical framework, the authors synthesize and map AI and CB literature. This research uses bibliometrics to ensure relevance, urgency, necessity, and importance for theory progress (Mukherjee et al., 2022). Scientific mapping and performance analysis anticipate future AI and CB research subjects in this hybrid study. Conclusions include theoretical contributions, managerial implications, and review limits. Finally, the survey identified intriguing research subjects and large literature shortages. The structure of our paper is as follows. Data selection is explained in Section 2. Our findings are in Section 3 and bibliographic coupling and content analysis of AI and CB literature are in Section 4. We recommend more research in Section 5.

Literature Review

Hybrid Review

Hybrid reviews evaluate authors, journals, and institutions in a subject topic using bibliometric and structured reviews (Hassan & Loebbecke, 2017; Lowry et al., 2013; Paul & Criado, 2020). This study examined AI in e-commerce research using Aria and Cuccurullo (2017)'s bibliometric methodology. The process includes data collection, processing, visualization, and reporting. Data collection involves database searches, selection, and export. Scopus core database searches for 1975–2020 articles provided this study's sample data. This database was chosen over Google Scholar and Web of Science because it has fewer duplicate records (Ferreira et al., 2014) and better high-impact journal coverage (Chadegani, et al., 2013). The qualitative cross-cutting meta-literature review uses content and quantitative bibliometric analysis. Business literature uses this strategy (Saeed, Hwang & Mun, 2003; Han & Stoel, 2017). Price (1965) studied academic networks using bibliometrics, while content analysis analyzes literature dynamics and trends using qualitative approaches (Martínez-López et al., 2018; Paul & Bhukya, 2021).

The methodological framework guided our analysis of four areas: Analysis of bibliographic citations and keywords/cartography 3) Bibliography; 4) Content. (Shaikh et al., 2023; Baker et al., 2021; Cruz-Cárdenas et al., 2021; Paul & Criado, 2020; Van Eck and Waltman, 2010) developed visualization networks with VOSviewer.

Database Identification

Scopus covers all major scientific, technological, health, social sciences, and arts and humanities fields with over 23,000 peer-reviewed journals, conference proceedings, and trade publications. This makes it valuable for various fields' bibliometric studies. Author affiliations, funding sources, references, abstracts, and keywords are listed for each publication. Well-structured and standardized metadata simplifies cross-disciplinary publication comparability.

Academics can evaluate citation patterns, identify notable papers and authors, and track publication effect using Scopus. Scholars and institutions' influence is measured by Scopus' h-index and CiteScore. Some research fields may benefit from Google Scholar or Web of Science. Scopus has related articles.

Data Selection

The sample selection process has three steps. Selecting a database for bibliometric study is the initial step. Scopus, a reliable database without biases against any publication, is used for this study's bibliometric analysis (Herrera-Franco et al., 2021; Lim et al., 2023).

A bibliometric study on AI and CB uses inclusion and exclusion criteria to select studies. These requirements ensure targeted, relevant, and high-quality research. Here are inclusion criteria:

- Research examining the relationship between AI and CB.
- Peer-reviewed studies
- English-language studies
- 1960-2024 studies
- Bibliometric analysis studies on AI and CB.

Using pertinent terms, we did a second-stage literature search. With relevant terms, we searched the literature again. Two keyword search criteria exist. First, we search for “artificial intelligence” and “consumer behavior” in the article title because this study aims to assess the impact of AI on customer behavior. This trial yielded 398 articles. VOSviewer keyword analysis extracts the most common AI and CB alternative keywords. Thus, we searched again using a more complete list of keywords: "artificial intelligence" OR "machine learning" AND (“consumer behavior" OR "consumer engagement" OR "purchase intention*" OR "perceived ease of use").

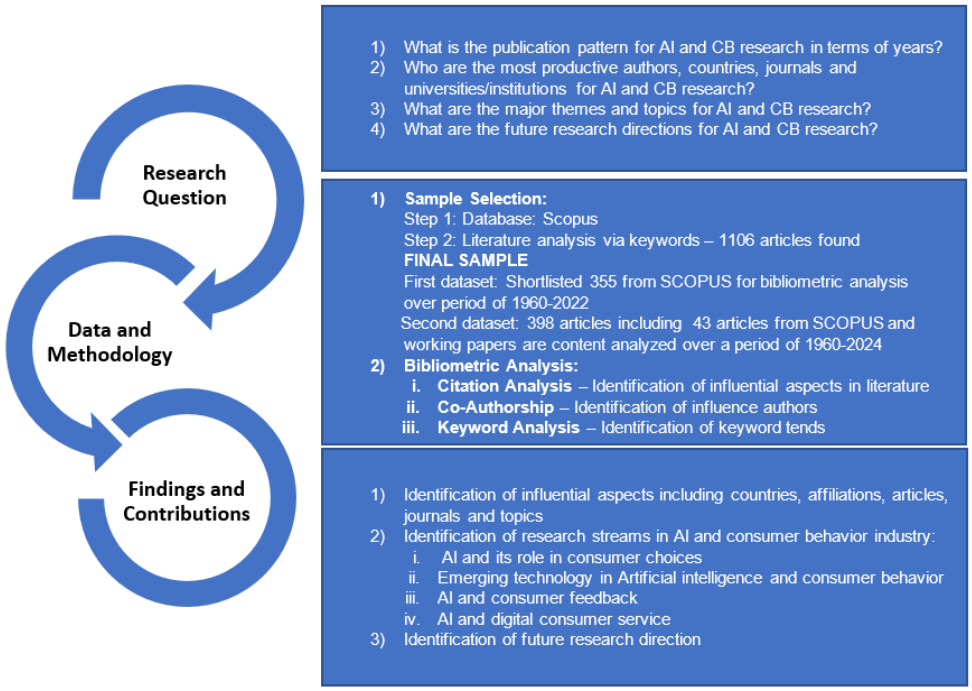
These keywords yielded 1102 entries from the database up to December 2022 (The authors have also included the articles of 2023-2024 in the final dataset. Please see Figure 1). We utilized these primary filters:

1. Publications must be in marketing, technology, consumer research, business, or management domains.
2. Selected studies that were easily accessible, published in English, and as articles.
3. To assure publishing quality, we sample papers from journals having an Academic Journal Guide ranking of 2 or higher (AJG).

The third and final step involves two researchers independently, in-depth reviewing each article for applicability. All AI papers targeting teachers, schools, e-learning, and students were rejected. The final sample has 398 articles. Figure 1

illustrates our strategy.

Figure 1: Methodological Approach

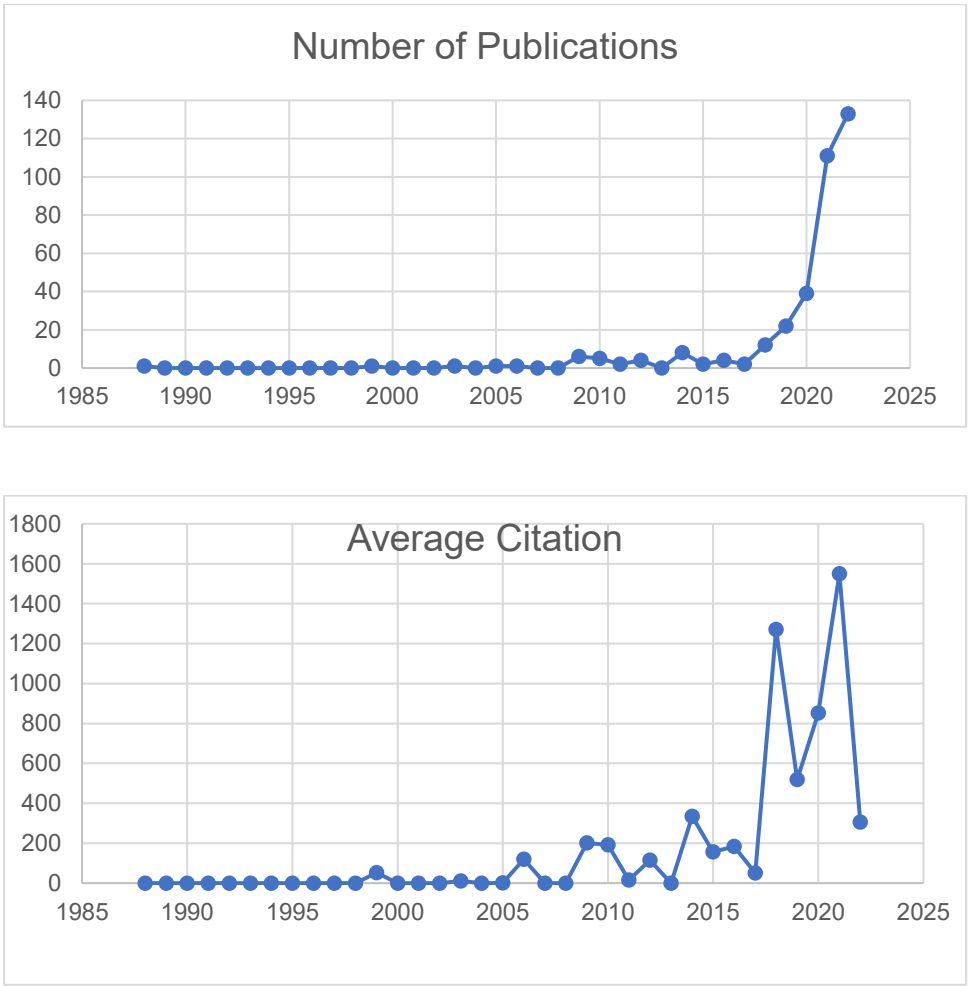


Findings

General Information

Figure 2 shows paper distribution and average citations throughout time. The impact of research (average citations) was almost ignored until 2015. There are two basic causes: (1) rapid technology breakthroughs after 2015 and (2) digitization-driven robots, sensors, and AI and Industry 4.0 innovations (Furman & Seamans, 2019). The global pandemic has necessitated e-commerce and omni channel technology upgrades (Tran, 2021). More study on Amazon Go, cashless food stores, virtual assistants like Alexa, Siri, and chatbots is predicted due to the pandemic (Hoang, Kousi & Martinez, 2022).

Figure 2: Evolution of number of articles published each year and number of citations by sampled papers



Influential Countries and Institutions

Table 1 shows top countries (Panel A) and institutions (Panel B) in AI and consumer literature. The US leads with 68 articles, followed by China, India, and the UK with 65, 48, and 43 articles. The literature is scattered in South Korea, Australia, and Europe. Swansea University produced the most AI and CB articles, followed by Griffith University, Bristol University, Massachusetts Institute of Technology, and Tsinghua University. It's noteworthy that while most articles are from the US, Swansea University has the most, likely because both countries have invested considerably in technology and work closely with industry.

Table 1: Most Influential Countries and Institutions.

Panel A Leading Countries

Rank	Country names	No. of articles	Share in sample
1	United States	68	19%
2	China	65	18%
3	India	48	14%
4	United Kingdom	43	12%
5	South Korea	24	6%
6	Spain	20	6%
7	Australia	18	5%
8	Taiwan	17	5%
9	Germany	13	4%
10	Canada	13	4%

Panel B Leading institutions

Rank	Institution names	No. of articles	Share in sample
1	Swansea University, United Kingdom	7	2%
2	Griffith University, Australia	7	2%
3	University of Bristol, United Kingdom	6	2%
4	Massachusetts Institute of Technology, United States	5	2%
5	Tsinghua University, China	4	1%
6	Carnegie Mellon University, United States	4	1%
7	Beijing Normal University, China	3	1%
8	University of British Columbia, Canada	3	1%
9	University of Amsterdam, Netherlands	3	1%
10	Nanyang Technological University, Singapore	3	1%

Top Journals on AI and CB

Table 2 shows trending journals for AI and CB research. All top journals have ABCD impact factors of A* or A, except Telematics and Informatics, which is C. Information Systems Research and Management Science have 4* AJG rankings. Their fields are business and services. Exceptions include Computers in Human Behavior, Technological Forecasting, Social Change, and Decision Support Systems in Operations Research and Management Sciences Services.

Leading marketing publications covering AI and CB include from business, computer science, human-computer interface, and cyberpsychology. Business Research published the most (11 papers), followed by Computers in Human Behavior (10), Journal of Retailing and Consumer Services (8), Technological Forecasting and Social Change (8), and Service Management (3).

Table 2: Top Journals in AI and Consumer Behavior Literature

Sources	Articles	% of Total Sample	Publisher	IF	ABDC Ranking	AJG Ranking
Journal of Business Research	11	3	Elsevier	10.969	A	3
Computers in Human Behavior	10	2.8	Elsevier	8.957	A	2
Journal of Retailing and Consumer Services	8	2	Elsevier	10.972	A	2
Technological Forecasting and Social Change	8	2	Elsevier	10.884	A	3
Journal of Service Management	3	1	Emerald Group Publishing	11.768	A	2
Decision Support Systems	3	1	Elsevier	6.96	A*	3
Information Systems Research	3	1	The Institute for Operations Research and the Management Sciences (INFORMS)	5.490	A*	4*
Telematics and Informatics	3	1	Elsevier	9.14	C	N/A
Management Science	2	0.6	INFORMS	6.172	A*	4*
International Journal of Information Management	2	0.6	Elsevier	18.958	A*	2

Influential Authors

Table 3 lists the most cited authors by published publications (Panel A) and total citations. These panels have two basic functions: 1) to recognize market discipline AI and CB authors and 2) to appreciate their contributions to the literature. In CB literature, Eleonora Pantano from Bristol University led, followed by Yogesh N. Dwivedi from Swansea University and Jungkeun Kim from Auckland University of Technology. The authors provide the top citation-counting writers (Table 3 Panel B). One Journal of Service Management work co-authored by 7 scholars has been mentioned 586 times since 2018. The authors and their universities are: Thorsten Gruber, Loughborough University; Werner H. Kunz, University of Massachusetts Vinh Nhat Lu of Australian National University, Antje Martins of University of Queensland, Stefanie Paluch of Rheinisch-Westfälische Technische Hochschule Aachen University, Paul G. Patterson of University of New South Wales, and Jochen Wirtz of National University of Singapore. A majority of the highly cited authors are affiliated with institutions in the United Kingdom and the United States.

Table 3: Most Influential Authors in AI and Consumer Behavior Literature

Panel A: Leading Authors by publications				
Rank	**Authors**	**Institute**	**Country**	**No. of Articles**
1	Eleonora Pantano	University of Bristol	UK	6
2	Yogesh K. Dwivedi	Swansea University	UK	5
3	Jungkeun Kim	Auckland University of Technology	New Zealand	5
4	Youran Zhang	Wenzhou-Kean University	China	5
5	Catherine Prentice	University of Southern Queensland	Australia	4
6	Jorge Casillas	University of Granada	Spain	3
7	Ying Chen	Griffith University	Australia	3
8	Charles Dennis	Middlesex University	London	3
9	Phil Klaus	International University of Monaco	Monaco	3
10	Ziyang Li	Tsinghua University	China	3
Panel B: Leading Authors by total citations				
Rank	**Authors**	**Institute**	**Country**	**Total Citations**
1	Thorsten Gruber	Loughborough University	UK	586
2	Werner H. Kunz	University of Massachusetts	USA	586
3	Vinh Nhat Lu	Australian National University	Australia	586
4	Antje Martins	The University of Queensland	Australia	586
5	Stefanie Paluch	Rheinisch-Westfälische Technische Hochschule Aachen University	Germany	586
6	Paul G. Patterson	University of New South Wales	Australia	586
7	Jochen Wirtz	National University of Singapore	Singapore	586
8	Yogesh K. Dwivedi	Swansea University Bay Campus	UK	512
9	Yichuan Wang	University of Sheffield	UK	365
10	Vikram Kumar	Symbiosis Institute of Business Management	India	357

Top Schools/Departments on AI and CB Literature

The University of Bristol's Department of Management has the most published articles (Table 4 Panel A), followed by Princess Nourah Bint Abdulrehman University's Department of Business Administration and Brunel University's Department of Electronic and Computer Engineering. In any discipline, highly cited and trending pieces shape literature and future study. Table 4 (Panel B) shows that citation analysis required 8 citations for an item to be included in the subsequent analysis.

Table 4: Top Schools/Departments on AI and consumer behavior

Panel A: Top Schools/Departments by Publications				
Rank	**Schools/ Departments**	**Universities**	**Country**	**Articles**
1	Department of Management	University of Bristol	UK	3
2	Department of Business Administration	Princess Nourah Bint Abdulrahman University	Saudi Arabia	2
3	Department of Electronic And Computer Engineering	Brunel University	United Kingdom	2
4	Department of Information Systems	Zayed University	UAE	2
5	Department of Marketing, Branding & Tourism	Middlesex University Business School	UK	2
6	Doctoral School of Economic And Regional Sciences	Hungarian University of Agriculture and Life Sciences	Hungary	2
7	Information Systems Department	Najran University	Saudi Arabia	2
8	Institute of Agricultural and Food Economics	Hungarian University of Agriculture and Life Sciences	Hungary	2
9	Stern School of Business	New York University	USA	2
10	Tepper School of Business	Carnegie Mellon University	USA	2
Panel B: Top Schools/Departments by Number of Citations				
Rank	**Schools/ Departments**	**Universities**	**Country**	**No. of Citations**
1	Institute of Agricultural and Food Economics	Hungarian University of Agriculture And Life Sciences	Hungary	116
2	Department of Management	University Of Bristol	UK	82
3	Doctoral School of Economic And Regional Sciences	Hungarian University of Agriculture and Life Sciences	Hungary	27
4	Department of Business Administration	Princess Nourah Bint Abdulrahman University	Saudi Arabia	19
5	Department of Marketing, Branding & Tourism	Middlesex University Business School	UK	19

6	Tepper School of Business	Carnegie Mellon University	USA	19
7	Department of Electronic and Computer Engineering	Brunel University London	United Kingdom	8
8	Department of Information Systems	Zayed University	UAE	8
9	Information Systems Department	Najran University	Saudi Arabia	8
10	Stern School of Business	New York University	USA	6

Network Visualization of Literature

Keyword/Cartographic and Trend Analysis

This portion uses cartographic, keyword, and trend studies to describe the rise and progress of AI and CB literature. (Van Eck and Waltman, 2010; Khan et al., 2021). The keyword analysis has three-occurrence minimum inclusion criteria for each keyword (Khan, et al., 2020). Total link strength of 4960 produces 108 keywords. Due to low keyword frequency outside 2018-2021, trend analysis is confined to this area. Figures 3 and 4 show results.

In Figure 3, "artificial intelligence", "machine learning" and "consumer behavior" are the most common keywords. Figure 4 shows that the early literature (2018–2019) emphasizes behavioral research and data mining, then e-commerce and machine learning, and finally sentiment analysis, deep learning, and consumer engagement to predict consumer responses.

Figure 4 shows that "artificial intelligence" (134), "consumer behavior" (122), "machine learning" (111), and "sales" (60) were the most prevalent words. This analysis supports our study keywords.

Trend analysis is limited to 2018–2021 due to rare terms outside this time range. Trend analysis reveals that early AI research focused on goals (Huang et al., 2021). impacts on CB (Thiebaut, 2019).

Figure 3: Visualization of network connections between keywords present in sampled papers

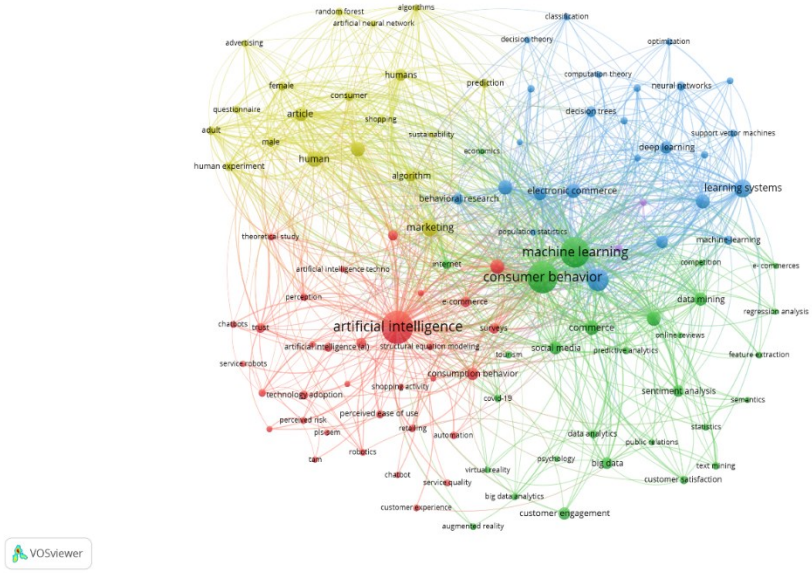
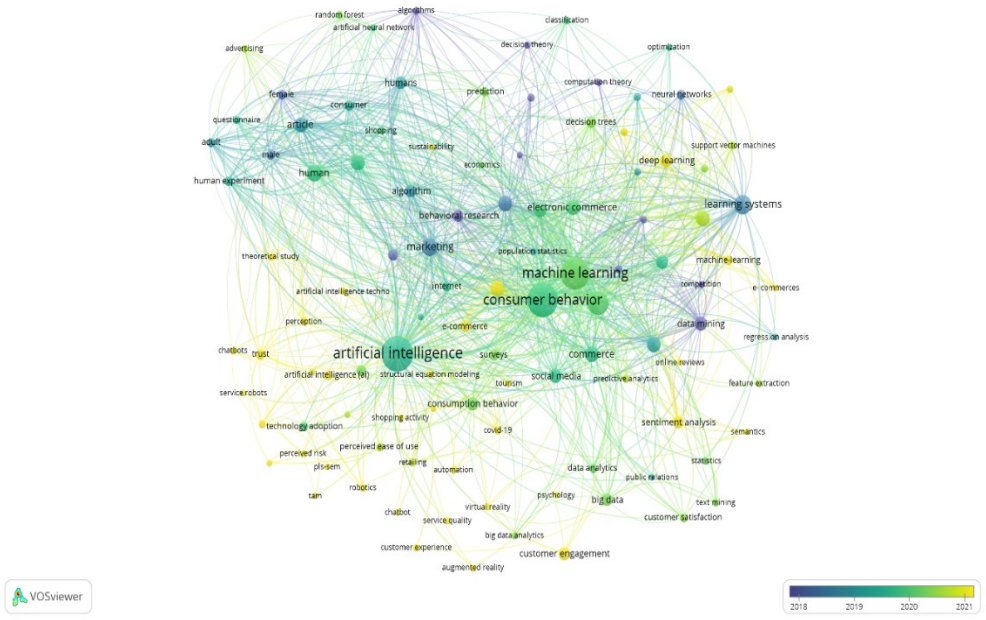


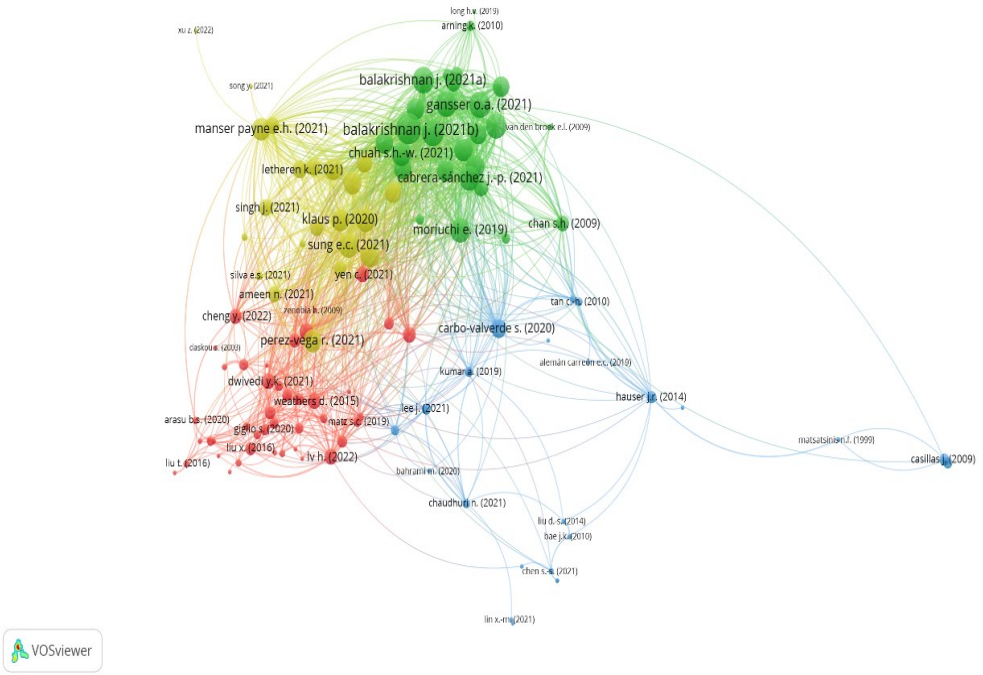
Figure 4: Trend-analysis. This chart shows keyword relationships, their evolution, and their relative weight (bubble size) in sampled publications



Bibliographic coupling and content analysis

Bibliographical coupling aims to show study field literature dimensions and streams. Figure 5 shows our bibliographical coupling study, which uses colors to distinguish AI and CB literature streams.

Figure 5: Network visualization of research streams.



For bibliometric coupling, Van and Waltman (2019) suggest analyzing distinct documents, journals, or authors. Jia et al., (2018) found four streams in 398 papers with at least 8 citations. AI and consumer choices (Red, 44 publications); Emerging technology in AI and CB (Green, 28 posts); AI and customer feedback (Blue, 23 articles); and AI and digital consumer service (Yellow, 22 articles). We critically examined all stream articles and presented the state-of-the-art information separately in the following paragraphs.

AI and its Role in Consumer Choices

This stream focuses on AI functions and their effects on eWOM, social media marketing, and purchase intention. Word-of-mouth spreads consumer opinions. Online product reviews and eWOM can impact their preferences (Rong et al., 2012). Businesses can struggle to sort online reviews to determine customer demands. Brand managers—including his social media marketing team—must counsel consumers when browsing (Qazi et al., 2014).

Communication quality affects consumer-brand connections (Cheng & Jiang, 2021). Lee et al., (2018) found that brand personality content like emotions and humour boosts social media marketing content engagement. Clicks, shares, and message

comments measured consumer engagement. Perceived utility value stimulates customer purchase intention, while hedonic value predicts it better (Yin & Qiu, 2021). In 1974, Mehrabian and Russell created the Stimulate-Organism-Response (SOR) model to study users' AI technology experiences.

Ahmad et al., (2020) found that trailer reviews predict movie ticket sales by predicting buy intention. Business marketing decision support systems can include weather data to anticipate customer buy intention and variety-seeking (Tian et al., 2018). Pantano and Dennis (2019) studied department store exteriors and tourism. Use of machine learning. We assessed firm profitability using visual analysis instead of surveys or interviews to estimate purchasing intention. Pantano et al., (2018) analyzed UK fast fashion customers' tweeted interactions, postings, ratings, items, and services using machine learning. The study found that consumers' positive and negative emotions boost marketing intelligence and decision-making. Consumer-brand relationships with quick fashion brands can improve with positive tweets. The incapacity of AI to make social assessments may help clients who feel humiliated, bashful, or guilty. Further research is needed to determine AI's consumer benefits. Mariani et al., (2022)

Lv et al., (2022) bibliometrically analyzed 270 hospitality and tourism periodicals from 2007 to 2020. Tourism Management published most, followed by International Journal of Hospitality Management and International Journal of Contemporary Hospitality Management. Research on AI and big data in hospitality and tourism is expanding. For sustainable tourism and hospitality, authorities, especially the government, must comprehend and use big data and AI.

Emerging Technology in AI and CB

This stream discusses AI and technology acceptance (Gao & Huang, 2019; Chatterjee et al., 2020; Pillai & Sivathanu, 2020; Gansser & Reich, 2021; Habib & Hamadneh, 2021; Seo & Lee, 2021; Uzir, 2021), AI and theory of planned behavior, and digital assistants.

Chatterjee et al., (2020) evaluated privacy and security issues utilizing 324 Indian industry answers to determine how perceived ease of use influences stakeholders' perceptions about AI-integrated CRM. Due to technology and customer adoption, market actors behave differently (Abrardi, Cambini, & Rondi, 2022). The largest AI ethical, justice, and privacy issues are likely overlooked. AI's extraordinary power (Bornet et al., 2021) creates ethical difficulties (Belk, 2021; Breidbach & Maglio, 2020), such as discriminating against consumers by leveraging client data in automated decision-making systems. AI may lead to issues like autonomy, dignity, social isolation, and dehumanization (Belk, 2021; Čaić et al., 2018).

In 2020, Pillai and Sivathanu evaluated hospitality consumers' AI-powered chatbot usage and behavioral intention. Technological fear did not predict, but ease of use, anthropomorphism, intellect, and trust did. The study improves robot-human TAM. Tourism and hospitality adoption of AI and robotics (AIR) depends on personal, service, technical, performance, social, cultural, and infrastructure factors (Goel et al., 2022). It also emphasized psychological, social, financial, technological, and functional challenges consumers face when incorporating robots and AI into hospitality and tourism. Chatterjee et al., (2021) found that AI-CRM system maintenance requires skilled and tech-savvy people. The variables determining the association between AI goods and behavioral intention in health, mobility, and household segments were examined using SEM by Gansser & Reich (2021) with 21841 respondents. This study contributed

personal innovativeness, safety security, sustainability, convenience, comfort, and sustainability to UTAUT2.

Using customers' smart service belief characteristics and experience with AI-powered smart TV (AI TV), Gao & Huang (2019) examined technology acceptability and found that perceived two-way communication, co-creation, and customisation drive the extended technology adoption paradigm. Companies must blend perceived risk, trust, and enjoyment with the original robot service restaurant technology acceptance model to compete. (Seo & Lee, 2021).

Mobile recommendation agents (MRAs)' perceived usefulness affects retailer preferences, product purchases, and usage intentions, according to Kowatsch & Maass (2010). The study encouraged store managers to provide free WLAN for electronic product information and RFID, barcode, and QR code items. Chen (2014) used Universal Technology Acceptance and Use to test RFID. The results reveal that social influence and simplicity most influence RFID usage and purchase intention.

Chattaraman et al., (2019) studied social, functional, and behavioral intent in online purchase tasks and found that a digital assistant's conversational style and internet expertise considerably affected results. This study evaluated older consumers since they had more e-tail shopping within-group variance than younger cohorts. Hasan et al., (2021) observed that Siri adoption is low compared to billions of consumers. They found that perceived risk hurt AI-based gadget brand loyalty whereas innovation, interactivity, and customer trust helped. Innovative consumers liked Siri's originality.

AI and Consumer Feedback

This stream covers machine learning techniques, CB, and choice prediction (Kanavos et al., 2018; Carbo-Valverde et al., 2020; Chaudhuri et al., 2021; Lee et al., 2021; Siva & Prabha, 2021; Tan, Teo, & Benbasat, 2010; Hauser, 2014; Liu et al., 2018; Carreón et al., 2019; Kumar et al., 2019).

For modeling marketing problems using consumer reaction, Cui et al., (2006) advocated the Bayesian network. Combining customer transaction parameters, longevity, recency, frequency, and monetary value predicted purchases. Martínez-López & Casillas (2009) created a multi-objective fuzzy rule development technique that incorporates data collecting, mining, and knowledge analysis. They agreed that speedy decision-making demands accurate technical skills, thus consumer decision-making patterns must be studied. Company performance depends on consumer data management. To reduce unnecessary variables, Siva & Prabha (2021) suggest combining Bagging Homogenous Feature Selection (BHFS) with Ensemble data perturbation methods instead of Naïve Bayes alone.

Hauser (2014) examined the new theory and consumers' responses using unstructured elicitation, machine learning, greedoid techniques, Bayesian inference, and measurement formats to find and reproduce “what-if” instances in several heuristics. Heuristics selection rules help shoppers choose products from their consideration set, according to the study. Liu et al., (2018) found that long short-term memory (LSTM) improves consumer decision prediction and outperformed linear regression in a simulation. Tan et al., (2010) supported resource-matching theory. Taghikhah et al., (2021) explored how numerous factors affect unplanned, impulsive, and planned consumer purchases among 1003 Australians and discovered that affective and normative cues may drive impulsive buying, which may contradict consumer views.

AI and Digital Consumer Service

Digital customer service, chatbots, mixed reality, and consumer engagement are covered in this stream (Silva & Bonetti, 2021; Singh et al., 2021; Sung et al., 2022; Payne et al., 2021; Letheren et al., 2021). Humanized-AI Social Interactivity Framework explains domestic service robots through social interactions and humanness. Consumers are human and have mild robot social connection, data shows. Crolic et al., (2022) found that chatbot anthromorphism negatively affected next purchase intention, firm rating, and satisfaction when furious consumers utilized international telecommunication companies' services in four studies. The study recommends carefully designing chatbots and considering user state while managing complaints. The emotional inadequacy of AI may encourage consumers to act unethically. Humanlike anthropomorphism reduces immorality (Kim et al., 2022). Marketing, consumer engagement, service, personalization and purchasing, social interaction and communication, cost-effectiveness, and CB insights enhance with ChatGPT (Paul et al., 2023). AI-inserted mixed reality has transformed retail and customer behavior by increasing voice detection via machine learning for MR immersion and spatial immersion, this increases customer participation (Sung et al., 2022).

Future Research Directions

Bibliometric and content analysis help us identify literature gaps and identify future research issues to explore AI's impact on CB. A summary is presented in Table 5.

Table 5: Future Research Agenda

Streams	Research Questions	Source
AI and its role in consumer choices	How to create automatic literature categorization software?	Lv, Shi, & Gursoy, (2021)
	How do we merge knowledge-guided data-driven machine learning methods?	Zhuang et al., (2017)
	Analyze what conceptual paradigms in different consumer cultures?	Cheng & Jiang (2021)
	How to compare contextual effects on consumer relationships?	
Emerging technology in AI and consumer behavior	How to study psychological and behavioral constructs in interactive user interfaces?	Gao & Huang (2019)
	How to classify similar services in purchase situations, such personalized grocery suggestions or dynamic	

	product bundle pricing?	Kowatsch & Maass (2010)
	How can integrating technologies to localize voice assistants (VA) create a strong company-consumer relationship?	Moriuchi (2019)
AI and consumer feedback	Integrating domain knowledge with supervised learning—when and how?	Cui, Wong, & Lui (2006)
	How can survey data be combined with real market transactions for realistic results?	Taghikhah et al., (2021)
	How can supervised learning quantify how packaging, origin, and other external characteristics affect consumer choices?	Kumar et al., (2019)
AI and digital consumer service	Which chatbot is best for each consumer encounter?	Crolic et al., (2022)
	How technology and non-technological variables affect digital natives' views of Baby Boomers and Gen Z?	Manser Payne, Peltier, & Barger (2018)

AI and its Role in Consumer Choices

Expanding large data types, improving analysis, and focusing on customer touch points are still needed. Big data and AI research predicted sales funnel consumer decision, but they could perform better. Chatbot or online review data was employed in big data consumption research. Merging large data from multiple sources can improve accuracy, impartiality, and trustworthiness (Pan & Yang, 2017). Future research should combine vast data from multiple sources for more accurate results. Big data from secondary sources and qualitative and quantitative data from surveys, in-depth interviews, focus groups, trials, and other sources may improve conclusions (Lv, Shi, & Gursoy, 2021).

Emerging technology in AI and CB

A new AI system called Decision Support System (DSS) analyzes consumer computation decisions. Future studies can examine how task qualities including relevance, complexity, opportunity cost, difficulty, and novelty affect DSS use (Chan, 2009). Pillai and Sivathanu (2020) lament tourism managers' lack of chatbot adoption and the relevance of simple chatbots in trip planning and administration. Future research can reveal chatbot usage and service provider issues. Future researchers could

study how AI VAs effect brand engagements across categories longitudinally (McLean et al., 2021).

AI and Consumer Feedback

Management responses to user-generated reviews have been studied inconclusively. Hotel ratings rise when management responds, say Proserpio and Zervas (2017). Wang and Chaudhry (2018) observed inconsistent outcomes depending on whether the answer was given after a favorable or negative assessment, while Chevalier et al., (2018) reported higher negative evaluations after management answers.

More research is needed to understand how events and platforms affect managerial reactions. Rising scholarship analyzes the impact of customer Q&As, where the network or provider directly answers consumer inquiries. For products that naturally raise fit concerns, answering questions enhances future ratings (Lee, Chakraborty, & Banerjee, 2022). Current research examines consumer characteristics and internet shopping mall qualities as determinants influencing consumer repurchase intention, however future research may explore e-service provider internet presence and site design attributes (Sharma & Kumar, 2019).

AI and Digital Consumer Service

Selecting and studying the best chatbot for any interaction based on its qualities and environment is important for future research (Crolic et al., 2022). Baby boomers, Generation X a ang Generation Alpha should be studied to determine how technology affects them. New mobile banking online consumer service comparisons with AI capabilities might also help. This concerns because chatbots use AI, and future AI mobile banking apps will allow more human-AI interaction (Payne et al., 2018).

AI, Culture and Neuroscience Tools

According to Hofstede (1980), culture is the collective programming of the human mind that shapes CB (Khoso et al., 2023; Özsomer et al., 2023; Walsh et al., 2014 Cultural differences effect AI's consumer impact. By juxtaposing Western and Eastern civilizations, Hofstede (2001) and Triandis (1989) contrast individualism and collectivism. Western civilizations value individualism, while Eastern societies value community. The Uncertainty Avoidance Index (UAI) varies by country, according to Hofstede (1980). Consumers may trust developing technology less to make decisions if UAI is high. Further AI and CB research should address cross-cultural differences to assess effectiveness.

Social impact also affects customer behavior (Burnkrant & Cousineau, 1975). Melnyk et al., (2022) argue that social norms affect customer behavior, although their optimal circumstances are unclear. Artificial intelligence and consumer behavior research have only explored social interaction with AI. No study has explored how norms, AI, and CB intersect; scholars should investigate this area.

Consumer decision-making brain activity may be studied using fMRI and machine learning techniques. Along with fMRI, EEG and AI can track brainwaves to uncover subconscious consumer decision-making effects. Researchers can forecast customer decisions using environmental signals using these three technologies and AI. Researchers can study VR/AR users' trust, attitudes, and behavior after AI-based personalization.

Managerial Implications

AI's effects on customer behavior can inform management, including its potential benefits. By investigating how AI affects CB, managers may better grasp the benefits of AI-powered products and apps like personalized recommendations, chatbots, and predictive analytics. Managers may better choose AI tools and apply them to improve customer experience with this knowledge. They can better engage and retain customers by learning how they use AI-powered products (Cheng & Jiang, 2021). Understanding how AI affects customer behavior can improve experiences. Faster, more efficient service and support can improve the customer experience with AI. Managers can increase customer satisfaction by knowing how consumers view AI-powered products and services. Managers may improve their AI plans to improve customer experience, loyalty, and corporate success by studying how AI affects CB (Hlee et al., 2023). Managers may better implement AI-powered products and applications into their marketing and sales strategy by knowing AI's pros and cons.

Conclusions

The bibliometric and content aspects were examined from 1960 until December 2022 (final dataset included articles till 2024) SCOPUS's limit allowing us to describe the future study opportunities.

The findings showed that the literature focuses on service, consumer choices, chatbots, business, market research, information systems and computer engineering. Four streams emerged: (1) AI and consumer choices; (2) Emerging technologies in AI and CB; (3) AI and customer feedback; and (4) AI and digital consumer service. Finally, we identify literature gaps and propose research areas and issues.

This study has several major limitations. Although comprehensive, our Scopus collection is not complete. Even though we included top-tier marketing journals, we did not include all global journals or conference proceedings from the American Marketing Association (AMA), Academy of Marketing Science (AMS), or European Marketing Academy Conference (EMAC). Our overall citations include these, but not as potentially significant papers. We included self-citations in our analysis. Even if this is typical, future research may find a way to operate and eliminate self-citations to better assess an article's significance. Despite its neutrality, bibliometric citation meta-analysis is subjective because we chose the search keywords and period (Van Raan, 2003). We used researcher triangulation to eliminate exclusion biases. Future studies may highlight non-English research in academic literature.

Another disadvantage of our bibliometric analysis is that it uses publications from other journals. Current "hot topics" related to AI's impact on CB, such as consumer mistrust of technology (Hasan et al., 2021), AI marketing services (Huang & Rust, 2018), and others, were not prioritized because they may take time. These are important and recent study fields and are also essential to studying how AI affects CB. Our findings shed light on the intriguing and relatively new topic of AI-CB research.

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